PRELIMINARY WATER QUALITY MANAGEMENT PLAN (WQMP)

FOR

THE SHOPS AT JURUPA VALLEY

TPM 37890

IN THE

CITY OF JURUPA VALLEY

FEBRUARY 21, 2020

PREPARED FOR:

PANORAMIC DEVELOPMENT

MADOLE & ASSOCIATES, INC.

Engineering Communities for Life

Reference: 795-2849

PREPARED BY:

Madole & Associates, Inc.

PRELIMINARY WATER QUALITY MANAGEMENT PLAN (WQMP)

FOR

THE SHOPS AT JURUPA VALLEY

TPM 37890

IN THE

CITY OF JURUPA VALLEY

FEBRUARY 21, 2020

PREPARED FOR:

PANORAMIC DEVELOPMENT

MADOLE & ASSOCIATES, INC.

Engineering Communities for Life

Reference: 795-2849

PREPARED BY:

Madole & Associates

9302 Pittsburgh Avenue, Suite 230

Rancho Cucamonga, CA 91730

(909) 481-6322

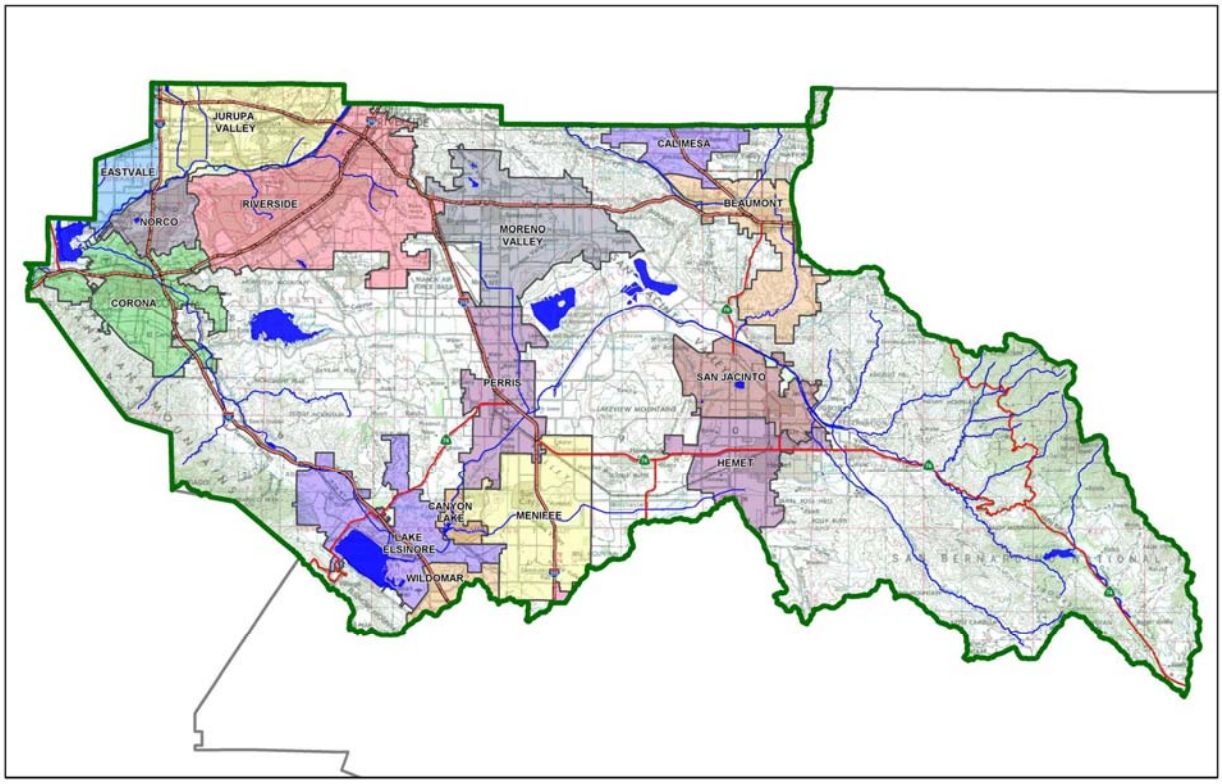
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: THE SHOPS AT JURUPA VALLEY, City of Jurupa Valley, CA
NORTH EAST CORNER OF MISSION BOULEVARD AND PYRITE STREET, JURUPA VALLEY, CA

Development No: TENTATIVE PARCEL MAP 37890

Design Review/Case No: MA19209 (PAR19008)



☒ **Preliminary**
☐ **Final**

Original Date Prepared: 02/21/2020

Revision Date(s):

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

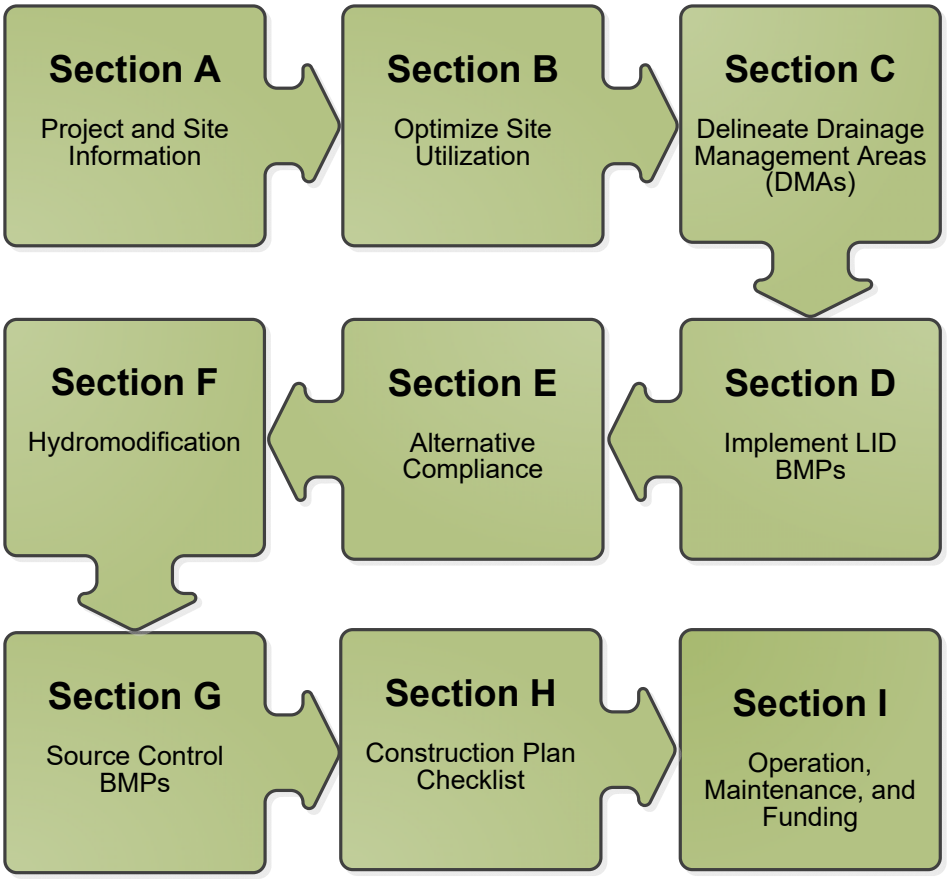
Contact Information:

Prepared for:
PANORAMA DEVELOPMENT
2005 WINSTON COURT
UPLAND, CALIFORNIA 91784

Prepared by:
Madole & Associates, Inc.
9302 Pittsburgh Avenue, Suite 230
Rancho Cucamonga, CA 91730
(909) 481-6322

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for **Panorama Development** by **Madole & Associates, Inc** for **The Shops at Jurupa Valley** project.

This WQMP is intended to comply with the requirements of the **City of Jurupa Valley and The County of Riverside** for **Order No. R8-2013-0024 and City of Jurupa Valley Ordinance No. 2012-07** which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under **City of Jurupa Valley and The County of Riverside** Water Quality Ordinance (Municipal Code Section 6.10.055).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	Date
JEFFREY K. RUPP	P.E.
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure: R.C.E. 42868 Exp: 03-31-20

Table of Contents

List of Tables

List of Appendices

Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	New Construction
Planning Area:	Jurupa/Pyrite
Community Name:	Glen Avon
Development Name:	The Shops at Jurupa Valley
PROJECT LOCATION	
Latitude & Longitude (DMS): 34.013447 N; -117.460165 W	
Project Watershed and Sub-Watershed: Santa Ana Watershed, Chino Basin Watershed Management Area, Santa Ana River Reach 3	
APN(s): 171-020-001; 171-020-025	
Map Book and Page No.: Thomas Bros. Map Book Page 644 Grid 7- F & G	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Commercial/Retail
Proposed or Potential SIC Code(s)	DIVISION G
Area of Impervious Project Footprint (SF)	1,384,664
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	195,196
Does the project consist of offsite road improvements?	☐ Y ☒ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	1,359,664
Is the project located within any MSHCP Criteria Cell?	☒ Y ☐ N
If so, identify the Cell number: 75	
Are there any natural hydrologic features on the project site?	☒ Y ☐ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	D
What is the Water Quality Design Storm Depth for the project?	0.74

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
PYRITE CHANNEL	NONE	NONE	NONE
SANTA ANA RIVER REACH 3	COPPER, LEAD, PATHOGENS	AGR, GWR, REC1, REC2, WARM, WILD, RARE	50 MILES
PRADO FLOOD CONTROL BASIN	NUTRIENTS, PATHOGENS, TSS	REC1, REC2, WARM, WILD, RARE	52 MILES
SANTA ANA RIVER REACH 2	INDICATOR BACTERIA	AGR, GWR, REC1, REC2, WARM, WILD, RARE	73 MILES
SANTA ANA RIVER REACH 1	pH	REC1, REC2, WARM, WILD	NONE
TIDAL PRISM OF SANTA ANA RIVER AND NEWPORT SLOUGH	NONE	REC1, REC2, COMM, WILD, RARE, MAR	82 MILES
PACIFIC OCEAN NEARSHORE ZONE	NONE	IND, NAV, REC1, REC2, COMM, WILD, RARE, SPWN, MAR, SHEL	83 MILES
PACIFIC OCEAN OFFSHORE ZONE	NONE	IND, NAV, REC1, REC2, COMM, WILD, RARE, SPWN, MAR	83 MILES

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☐ Y	☒ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)*	☐ Y	☒ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

A.4 Project Description:

Panorama Development is proposing the development of approximately 31.8 acres of commercial development. The project site is bounded to the north by the 60 Freeway and CalTrans Right of Way, to the west by Pyrite Street, to the south by Mission Boulevard and to the east by various types of developed and undeveloped areas. The project site is bisected by Pyrite Channel, and existing Riverside County Flood Control channel.

The open channel will be converted into a 12'x5' RCB underground, and the project site will contain to major drainage areas. DA1 will be areas to the east of the RCB and DA2 will be areas to the west of the RCB. Each drainage area will be broken up into three drainage management areas. A DMA for roofs, a DMA for Concrete and Asphalt, and a DMA for landscaping.

Each drainage area will have a separate underground storm drain system that will connect to the RCB at the southern boundary. Before water quality flows enter the RCB they will be diverted to underground detention and infiltration systems. Flows will first enter proposed 60" solid wall detention pipe. The detention pipe will be connected to proposed Torrent Resources Maxell Plus Drainage systems. Sediment and debris that doesn't settle out of the runoff in the detention pipe will be treated within the Maxwell Plus Primary Settling chamber. Trash, debris, and sediment will settle at the bottom of the chamber, while a floating sponge will absorb oils and pollutants. Runoff will then be routed into adjacent injection wells where infiltration will occur at depths up to 60 ft. No groundwater was encountered neat these depths during the geotechnical investigation.

Vegetated swales will be placed throughout the project site to decrease the required treated Design Capture Volume (Vbmp) in the downstream systems.

DRAINAGE AREA	DRAINAGE MANAGEMENT AREA	COVER TYPE	AREA	AREA	EXISTING SITE IMPERVIOUS AREA	PROPOSED SITE IMPERVIOUS AREA	PROPOSED SITE PERVIOUS AREA	Vbmp	Qbmp
			SF	AC	SF	SF	SF	CF	CFS
DA1	A	ROOF	178,789	4.1	13,796	940,091	132,477	54,000	4.0
	B	LANDSCAPE	132,477	3.0					
	C	CONCRETE/AC	761,302	17.5					
TOTALS		--	**1,072,568**	**24.6**	1.3%	88%	12%	--	--
DA2	A	ROOF	40,454	0.9	2,261	249,377	62,719	14,800	1.1
	B	LANDSCAPE	62,719	1.4					
	C	CONCRETE/AC	208,923	4.8					
TOTALS		--	**312,096**	**7.2**	0.7%	80%	20%	--	--
SITE TOTAL			**1,384,664**	**31.8**				**68,800**	**5.1**

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, constraints might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. Opportunities might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?
The development will alter existing drainage patterns by increasing the time of concentration due to it being a commercial development. However, the drainage areas contributing to Pyrite Channel will remain consistent with existing conditions.

Did you identify and protect existing vegetation? If so, how? If not, why?
The existing vegetation will not be preserved upon development of the site. However, areas not dedicated to buildings, drive aisles, and parking will be revegetated and landscape. There will also be various areas of vegetated swales on site.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?
Surface infiltration rates were determined to be insufficient. Therefore, deep underground percolation will be utilized in the site LID Design, with minor use of vegetated swales with underdrains on site.

Did you identify and minimize impervious area? If so, how? If not, why?
Due to the commercial/retail nature of the project site, it will be mainly impervious. However, by utilizing vegetated swales and parking medians, there will be a maximization of landscaping where feasible.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?
Runoff, where feasible, will be directed into vegetated swales via curb cuts, or zero inch curb for treatment and infiltration. Flows not treated within the swales will travel downstream to the underground infiltration systems.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
DA1-DMA A	BUILDING/ROOF	178,789	TYPE D
DA1-DMA B	LANDSCAPING/LID BMP	132,477	TYPE A
DA1-DMA C	CONCRETE/ASPHALT	761,302	TYPE D
DA2-DMA A	BUILDING/ROOF	40,454	TYPE D
DA2-DMA B	LANDSCAPING/LID BMP	62,719	TYPE A
DA2-DMA C	CONCRETE/ASPHALT	208,923	TYPE D

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
NONE			

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]
DA1-DMA B	NATURAL SOIL D	132,477	0.74	NONE		
DA2-DMA B	NATURAL SOIL/ D	62,719	0.74			

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product		Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]	DMA name /ID	[D]	[C]/[D]
NONE							

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DA1 - DMA A	UNDERGROUND SYSTEM #1
DA1 - DMA C	UNDERGROUND SYSTEM #1
DA2 - DMA A	UNDERGROUND SYSTEM #2
DA2 - DMA C	UNDERGROUND SYSTEM #2

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		x
If Yes, list affected DMAs: The average water table depth is 7 ft below ground surface.		
…have any DMAs located within 100 feet of a water supply well?		x
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		x
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		X
If Yes, list affected DMAs: PERCOLATION RATES TO BE USED FOR INJECTION WELL DESIGN		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		x
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here: **SOILS WITH MODERATE TO GOOD PERCOLATION RATES**		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*: **Not Applicable***

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☒The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site: **N/A**

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: Insert Area (Acres)

Type of Landscaping (Conservation Design or Active Turf): List Landscaping Type

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: EIATIA Factor

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: Insert Area (Acres)

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
Insert Area (Acres)	Insert Area (Acres)

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site: ***Not Applicable***

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: ***N/A***

Project Type: ***N/A***

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: ***N/A***

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: ***N/A***

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: ***N/A***

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**
Insert Area (Acres)	Insert Area (Acres)

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

Not Applicable

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: ***N/A***

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: ***N/A***

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3: ***N/A***

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: ***N/A***

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
Minimum use required (gpd)	Projected Average Daily Use (gpd)

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DA1	☒	☐	☐	☐	☐
DA2	☒	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

ALL WATER QUALITY FLOWS FROM THE PROJECT SITE WILL BE TREATED BY VEGETATED SWALES AND UNDERGROUND RETENTION AND INFILTRATION SYSTEMS.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here – INFILTRATION BASIN*		
DA1	[A]		[B]	[C]	[A] x [C]			
DMA A	178,789	ROOF	1	0.89	159479.8			
DMA B	132,477	NATURAL D (SOIL)	0.40	0.28	37055.4			
DMA C	761,302	CONCRETE/ ASPHALT	1	0.89	679081.4			
						Design Storm Depth (in)	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$A_T = \Sigma[A]$				Σ= [D] = 875646.6	**0.74**	**53,996.4**	***54,000***

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
DA2	[A]		[B]	[C]	[A] x [C]			
DMA A	40,454	ROOF	1	0.89	36085			
DMA B	62,719	NATURAL D (SOIL)	0.40	0.28	17543.3			
DMA C	208,9223	CONCRETE/ ASPHALT	1	0.89	186359.3			
						Design Storm Depth (in)	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$A_T = \Sigma[A]$				Σ= [D] 239987.6	**0.74**	**14799.2**	***14,800***

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: MADOLE & ASSOCIATES, INC — Date: 2/18/2020

Designed by: TAYLOR SKAHILL — Case No:

Company Project Number/Name: THE SHOPS AT JURUPA VALLEY

BMP Identification

BMP NAME / ID: UNDERGROUND INFILTRATION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.74 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A	*178,789*	*Roofs*	*1*	*0.89*	*159479.8*			
DMA B	*132,477*	*Natural (D Soil)*	*0.4*	*0.28*	*37055.4*			
DMA C	*761,302*	*Concrete or Asphalt*	*1*	*0.89*	*679081.4*			
	1072568	***Total***			**875616.6**	**0.74**	***53996.4***	***54,000***

Notes:

Bioretention Facility - Design Procedure	BMP ID: DA1 - SWALES	Legend:	Required Entries / Calculated Cells

Company Name: MADOLE & ASSOCIATES, INC. Date: 2/19/2020

Designed by: TGS County/City Case No.: TPM 37890

Design Volume

Enter the area tributary to this feature A_T = -- acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP} = 11,000 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.23 ft

Minimum Surface Area, A_m

$$A_M\,(ft^2) = \frac{V_{BMP}\,(ft^3)}{d_E\,(ft)}$$

A_M = 8,919 ft^2

Proposed Surface Area A= 8,919 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain inches

Longitudinal Slope of Site (3% maximum) 2.5 %

6" Check Dam Spacing 10 feet

Describe Vegetation:

Notes: FURTHER IN DEPTH DESIGN TO BE PROVIDED IN FINAL WQMP

MADOLE & ASSOCIATES, INC.
Engineering Communities for Life

Job: THE SHOPS AT JURUPA VALLEY
Job No. 795-2849
Calculated by: TS
Date: 2/19/2020

DA1 DESIGN CAPTURE VOLUME

Vbmp =	**54,000**	**FT^3**
Qbmp =	**4**	**CFS**
VEGETATED SWALES, Vret =	**11,000**	**FT^3**
Vbmp =	**43,000**	**FT^3**

DA1 INJECTION WELLS

P_{design}	8.1	IN/HR
P_{design}	0.00019	FT/SEC
T	24.00	hours
D_{INF}=	40	FT
$SA_{INF} = D_{INF}*12.57 + 12.57 =$	515.37	FT^2
	0.09663	CFS
24 HOUR VOLUME= $P_{DESIGN}*SA_{INF}*T_{FILL}$ =	**8,349**	**FT^3**
PROP. No. OF INJECTION WELLS =	5	EA.
INJECTION WELL RETENTION VOLUME =	**41,745**	**FT^3**

DA1 - PIPE LENGTH

PROPOSED PIPE DIAMETER =	5	FT
REQUIRED LENGTH OF PIPE =	64	FT

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: MADOLE & ASSOCIATES, INC — Date: 2/18/2020

Designed by: TAYLOR SKAHILL — Case No:

Company Project Number/Name: THE SHOPS AT JURUPA VALLEY

BMP Identification

BMP NAME / ID: UNDERGROUND INFILTRATION - DA2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.74 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A	*40,454*	*Roofs*	*1*	*0.89*	*36085*			
DMA B	*62,719*	*Natural (D Soil)*	*0.4*	*0.28*	*17543.3*			
DMA C	*208,923*	*Concrete or Asphalt*	*1*	*0.89*	*186359.3*			
	312096	***Total***			**239987.6**	**0.74**	***14799.2***	***14,800***

Notes:

Bioretention Facility - Design Procedure	BMP ID: DA2 - SWALES	Legend:	Required Entries / Calculated Cells

Company Name: MADOLE & ASSOCIATES, INC. Date: 2/21/2020

Designed by: TGS County/City Case No.: TPM 37890

Design Volume

Enter the area tributary to this feature A_T = -- acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP} = 5,000 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.23 ft

Minimum Surface Area, A_m

$$A_M\,(ft^2) = \frac{V_{BMP}\,(ft^3)}{d_E\,(ft)}$$

A_M = 4,055 ft^2

Proposed Surface Area A= 4,123 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain inches

Longitudinal Slope of Site (3% maximum) 2.5 %

6" Check Dam Spacing 10 feet

Describe Vegetation:

Notes: FURTHER DESIGN TO BE PROVIDED IN FINAL WQMP

MADOLE & ASSOCIATES, INC.
Engineering Communities for Life

Job: THE SHOPS AT JURUPA VALLEY
Job No. 795-2849
Calculated by: TS
Date: 2/19/2020

DA2 DESIGN CAPTURE VOLUME

Vbmp =	**14,800**	**FT^3**
Qbmp =	**1.1**	**CFS**
VEGETATED SWALES, Vret =	**5,000**	**FT^3**
Vbmp =	**9,800**	**FT^3**

DA2 INJECTION WELLS

P_{design}	7.7	IN/HR
P_{design}	0.00018	FT/SEC
T	24.00	hours
D_{INF}=	45	FT
$SA_{INF} = D_{INF}*12.57 + 12.57 =$	578.22	FT^2
	0.10306	CFS
24 HOUR VOLUME= $P_{DESIGN}*SA_{INF}*T_{FILL}$ =	**8,905**	**FT^3**
PROP. No. OF INJECTION WELLS =	1	EA.
INJECTION WELL RETENTION VOLUME =	**8,905**	**FT^3**

DA2 - PIPE LENGTH

PROPOSED PIPE DIAMETER =	5	FT
REQUIRED LENGTH OF PIPE =	46	FT

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

DA1: FLOWS NOT TREATED WITHIN VARIOUS VEGETATED SWALES WITHIN DRAINAGE AREA 1 WILL BE DIRECTED VIA UNDERGROUND STORM DRAIN TO PROPOSED UNDERGROUND RETENTION/INFILTRATION SYSTEMS. THE SYSTEMS WILL CONSIST OF 60" SOLID WALL HDPE STORAGE PIPE ATTACHED TO MAXWELL PLUS DRAINAGE SYSTEMS. THE ATTACHED INJECTION WELLS WILL DRAIN THE WATER QUALITY VOLUME.

DA2: FLOWS NOT TREATED WITHIN VARIOUS VEGETATED SWALES WITHIN DRAINAGE AREA 1 WILL BE DIRECTED VIA UNDERGROUND STORM DRAIN TO PROPOSED UNDERGROUND RETENTION/INFILTRATION SYSTEMS. THE SYSTEMS WILL CONSIST OF 60" SOLID WALL HDPE STORAGE PIPE ATTACHED TO A MAXWELL PLUS DRAINAGE SYSTEM. THE ATTACHED INJECTION WELL WILL DRAIN THE WATER QUALITY VOLUME.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☒ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☒ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☒	☒	☒	☒	☒	☒	☒	☒

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
NOT APPLICABLE	
Total Credit Percentage[1]	

[1]*Cannot Exceed 50%*
[2]*Obtain corresponding data from Table 3-8 in the WQMP Guidance Document*

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Area x Runoff Factor**		***Enter BMP Name / Identifier Here***		
	[A]		[B]	[C]	[A] x [C]				
N/A						*Design Storm Depth (in)*	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
NO CREDITS									
	A_T = Σ[A]				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12
[H] is from the Total Credit Percentage as Calculated from Table E.2 above
[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
VEGETATED SWALE	BACTERIAL INDICATIORS, METALS, NUTRIENTS, PESTICIDES, TOCs, SEDIMENT, TRASH AND DEBRIS, OIL AND GREASE	MEDIUM
UNDERGROUND INFILTRATION – MAXWELL PLUS INJECTION WELL SYSTEMS	BACTERIAL INDICATIORS, METALS, NUTRIENTS, PESTICIDES, TOCs, SEDIMENT, TRASH AND DEBRIS, OIL AND GREASE	HIGH

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.
[2] Cross Reference Table E.1 above to populate this column.
[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	INSERT VALUE	INSERT VALUE	INSERT VALUE
Volume (Cubic Feet)	INSERT VALUE	INSERT VALUE	INSERT VALUE

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

EHM DRINAGE FACILITIES: Pyrite Channel, Santa Ana River Reach 3, and Prado Dam Flood Control basin

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions: **NOT APPLICABLE**

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

NOT APPLICABLE

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
PARKING LOT	VEGETATED SWALE, UNDERGROUND INFILTRATION (DRYWELL)	STREET SWEEPING
LANDSCAPING	VEGETATED SWALE, UNDERGROUND INFILTRATION (DRYWELL)	STREET SWEEPING TO PREVENT ORGANIC WASTE FROM ENTERING AND CLOGGING UNDERGROUND SYSTEM AND SWALES
TRASH DISPOSAL	VEGETATED SWALE, UNDERGROUND INFILTRATION (DRYWELL)	ROUTINE DISPOSAL AND MAINTENANCE OF TRASH CONTAINERS TO PREVENT TRASH AND DEBRIS FROM ENTERING UNDERGROUND SYSTEM AND SWALES

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)
VEGETATED SWALES	PRELIM Water Quality Management Plan Site Plan	1
UNDERRGROUND SYSTEM #1	PRELIM Water Quality Management Plan Site Plan	1
UNDERRGROUND SYSTEM #2	PRELIM Water Quality Management Plan Site Plan	1

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: See Appendix 9 for O&M details

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)? **PARCEL OWNER'S ASSOCIATION**

☒ Y ☐ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

NOTE: A DETAILED OM&F PLAN WILL BE PROVIDED IN THE FINAL DESIGN STAGES.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

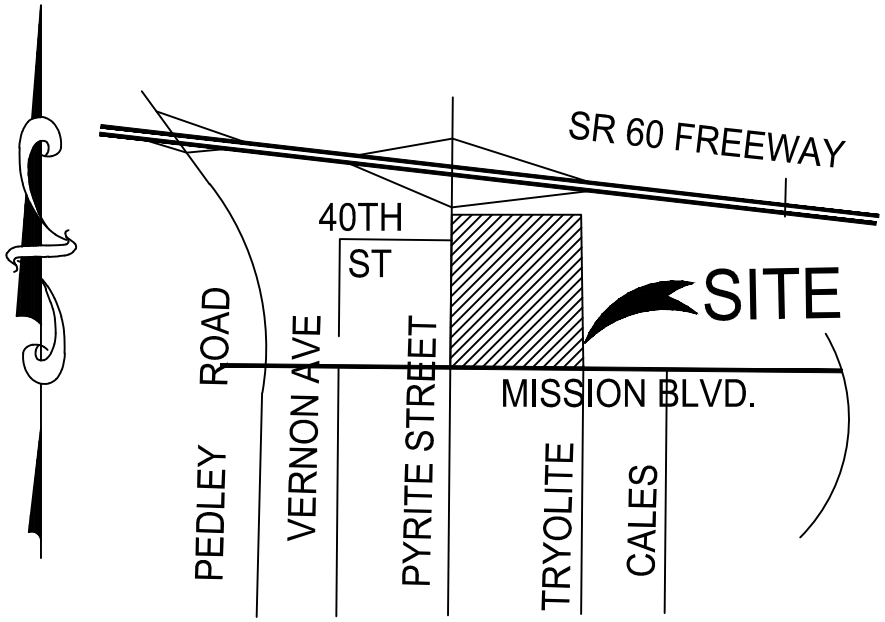
VICINITY MAP

WQMP BMP LOCATIONS MAP

RECEIVING WATER MAP

IMPAIRMENTS MAP – RIVERSIDE COUNTY

THE SHOPS AT JURUPA VALLEY
VICINITY MAP



VICINITY MAP
NO SCALE

PRELIMINARY WQMP EXHIBIT
FOR TPM 37890
CITY OF JURUPA VALLEY, IN THE COUNTY OF RIVERSIDE
STATE OF CALIFORNIA

WATER QUALITY SITE SUMMARY

DRAINAGE AREA	DRAINAGE MANAGEMENT AREA	COVER TYPE	AREA	AREA	EXISTING SITE IMPERVIOUS AREA	PROPOSED SITE IMPERVIOUS AREA	PROPOSED SITE PERVIOUS AREA	Vbmp	Qbmp
			SF	AC	SF	SF	SF	CF	CFS
DA1	A	ROOF	178,789	4.1	13,796	940,091	132,477	54,000	4.0
	B	LANDSCAPE	132,477	3.0					
	C	CONCRETE/AC	761,302	17.5					
TOTALS		--	1,072,568	24.6	1.3%	88%	12%	--	--
DA2	A	ROOF	40,454	0.9	2,261	249,377	62,719	14,800	1.1
	B	LANDSCAPE	62,719	1.4					
	C	CONCRETE/AC	208,923	4.8					
TOTALS		--	312,096	7.2	0.7%	80%	20%	--	--
SITE TOTAL			1,384,664	31.8				68,800	5.1

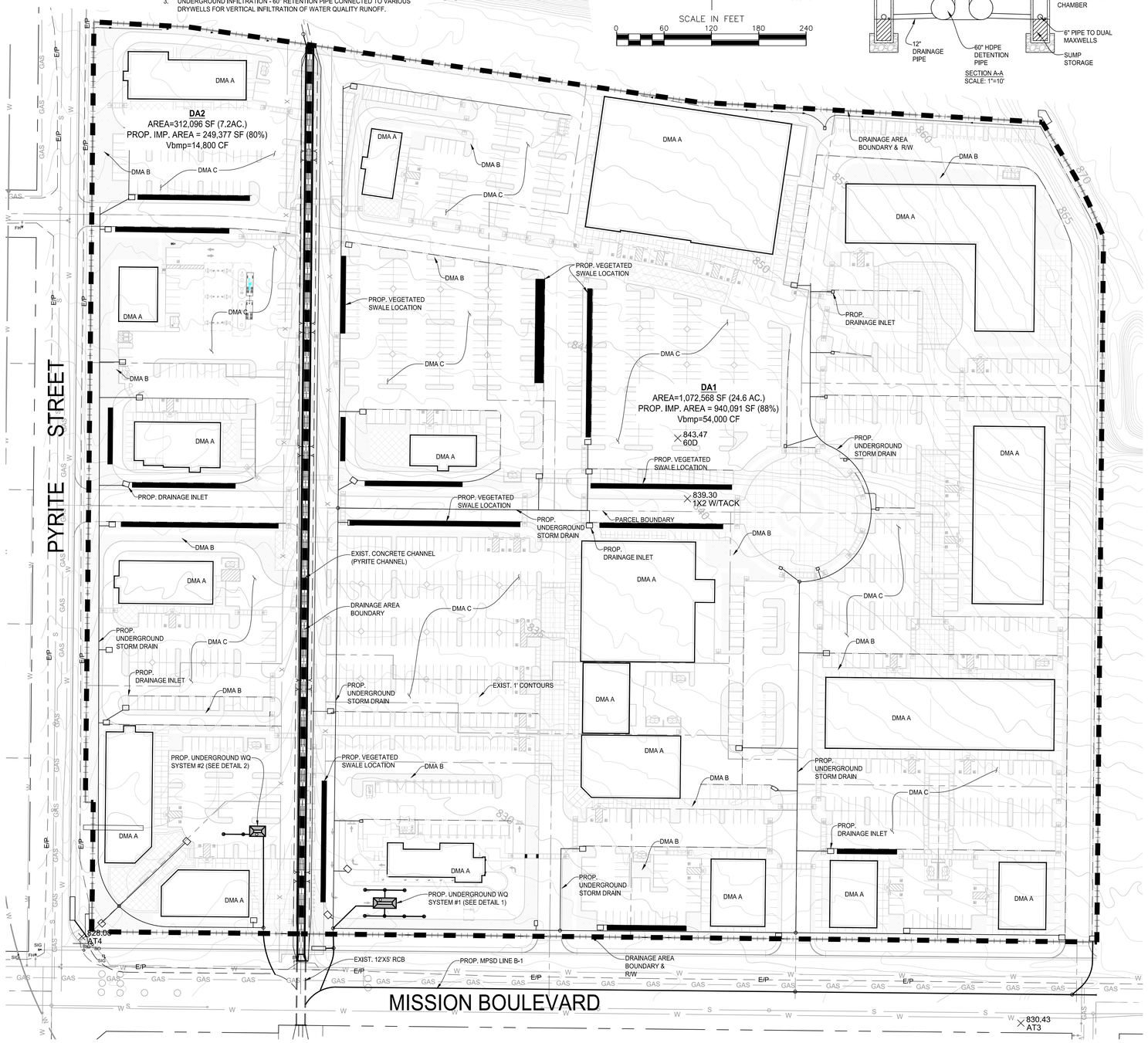
WATER QUALITY MITIGATION SUMMARY

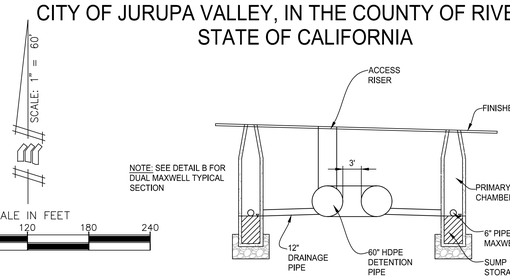
WATER QUALITY RUNOFF FROM THE PROJECT SITE WILL SHEETFLOW AND GUTTERFLOW TO VARIOUS CURB OPENING AND DROP INLETS THROUGHOUT THE SITE. IN SOME AREAS, PRIOR TO BEING INTERCEPTED, FLOWS WILL TRAVEL THROUGH A VEGEATED BIORETENTION FACILITY, OR VEGETATED SWALE FOR TREATMENT AND PARTIAL INFILTRATION PRIOR TO BEING INTERCEPTED BY UNDERGROUND STORM DRAIN.

THERE ARE TWO MAJOR DRAINAGE AREAS ONSITE, BISECTED BY THE PROPOSED REINFORCED CONCRETE BOX (PROPOSED REPLACEMENT OF EXISTING CONCRETE CHANNEL). THE EAST SIDE OF THE RCB IS DA1, AND THE WEST IS DA2. PRIOR TO FLOWS ENTERING THE RCB, A LOW FLOW DIVERSION INLET WILL INTERCEPT THE WATER QUALITY VOLUME REMAINING AND ROUTE IT INTO UNDERGROUND RETENTION PIPE. THE RETENTION PIPE WILL BE CONNECTED TO PROPOSED TORREN RESOURCES MAXWELL PLUS DRAINAGE SYSTEMS. THESE SYSTEMS CONSIST OF A PRIMARY SETTLING CHAMBER TO REMOVE OIL, POLLUTANTS, TRASH, DEBRIS, AND SEDIMENT FROM THE RUNOFF BEFORE ROUTING IT INTO ADJACENT DRYWELLS. THE DRYWELLS WILL PERCOLATE RUNOFF VERTICALLY AT DEPTHS UP TO 60 FT.

LIST OF PROPOSED BMPS

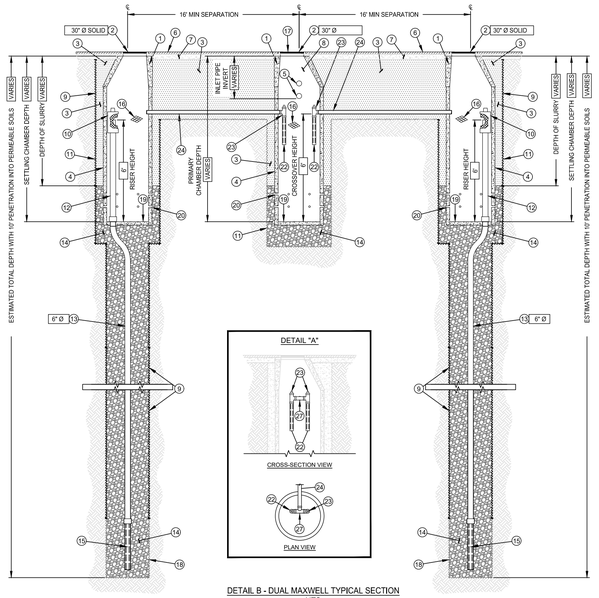
1. STORM DRAIN INLET/CATCH BASIN STENCILING - DISCOURAGE ILLEGAL DUMPING AND PROMOTE ENVIRONMENTAL AWARENESS AND PROTECTION OF STORM WATER QUALITY.
2. VEGETATED SWALES/ BIORETENTION FACILITIES - RUNOFF IN VARIOUS AREAS WILL BE ROUTED TO PROPOSED VEGETATED SWALES TO TREAT AND PARTIALLY INFILTRATE RUNOFF BEFORE IT ENTERS THE UNDERGROUND STORM DRAIN SYSTEM.
3. UNDERGROUND INFILTRATION - 60" RETENTION PIPE CONNECTED TO VARIOUS DRYWELLS FOR VERTICAL INFILTRATION OF WATER QUALITY RUNOFF.





NOTE: SEE DETAIL B FOR DUAL MAXWELL TYPICAL SECTION

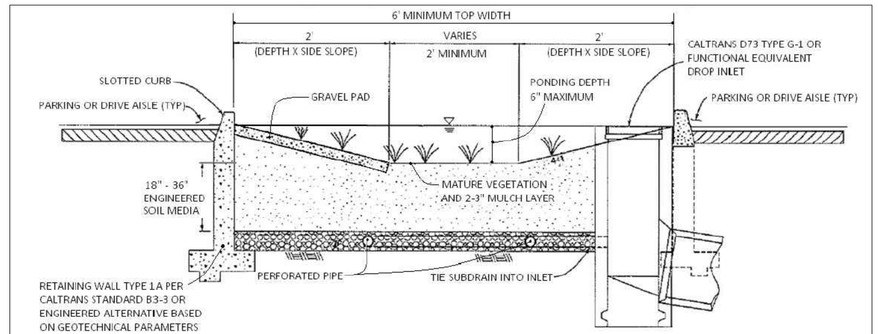
SECTION A-A
SCALE: 1"=10'



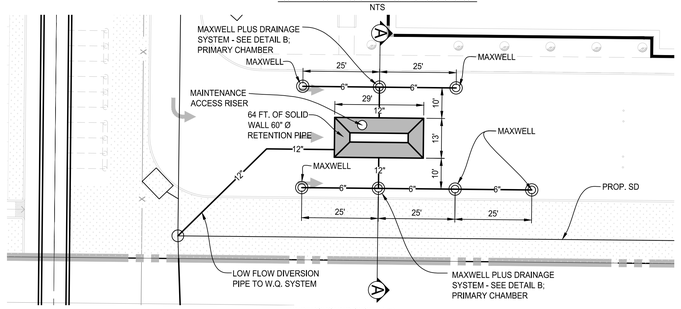
DETAIL B - DUAL MAXWELL TYPICAL SECTION
NTS

ITEM NUMBERS

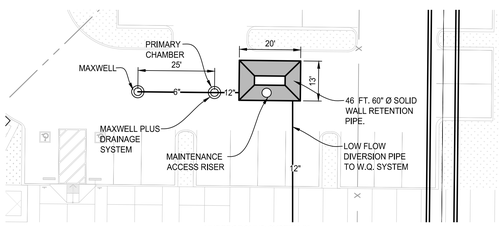
1. **MANHOLE CONE** - MODIFIED FLAT BOTTOM.
2. **BOLTED RING & GRATE/COVER** - DIAMETER & TYPE AS SHOWN. CLEAN CAST IRON WITH WORDING **"STORM WATER ONLY"** IN RAISED LETTERS. **BOLTED IN 2 LOCATIONS** AND SECURED TO CONE WITH MORTAR. RIM ELEVATION ±0.02' OF PLANS.
3. **STABILIZED BACKFILL** - TWO-SACK SLURRY MIX.
4. **PRE-CAST LINER** - 4000 PSI CONCRETE 48" ID, X 54" OD, **CENTER IN HOLE** AND ALIGN SECTIONS **TO MAXIMIZE BEARING SURFACE.**
5. **INLET PIPE/OUTLET PIPE** (BY OTHERS), SEE SEPARATE PLAN FOR INVERT ELEVATIONS.
6. **GRADED BASIN OR PAVING** (BY OTHERS).
7. **COMPACTED BASE MATERIAL**, IF REQUIRED (BY OTHERS).
8. **FREEBOARD DEPTH VARIES** WITH INLET PIPE ELEVATION. INCREASE PRIMARY AND SECONDARY CHAMBER DEPTHS AS NEEDED TO MAINTAIN ALL INLET PIPE ELEVATIONS ABOVE RISER PIPE.
9. **NON-WOVEN GEOTEXTILE SLEEVE** - MIRAFI 140 NL, MIN. 6 FT Ø. HELD APPROX. 10 FEET OFF THE BOTTOM OF EXCAVATION.
10. **PUREFLO® DEBRIS SHIELD** - ROLLED 16 GA. STEEL X 24" LENGTH WITH VENTED ANTI-SIPHON AND INTERNAL 0.265" MAX. SWG FLATTENED EXPANDED STEEL SCREEN X 12" LENGTH. **FUSION BONDED EPOXY COATED.**
11. **MIN. 6' Ø DRILLED SHAFT.**
12. **RISER PIPE** - SCH. 40 PVC MATED TO DRAINAGE PIPE AT BASE SEAL.
13. **DRAINAGE PIPE** - ADS HIGHWAY GRADE OR SCH. 40 PVC WITH TRI-A COUPLER, SUSPEND PIPE DURING BACKFILL OPERATIONS. DIAMETER AS NOTED.
14. **ROCK** - WASHED, SIZED BETWEEN 3/8" AND 1-1/2".
15. **FLOFAST® DRAINAGE SCREEN** - SCH. 40 PVC 0.120" SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/FT, WITH TRI-B COUPLER, OVERALL LENGTH VARIES, UP TO 120" WITH TRI-B COUPLER.
16. **ABSORBENT** - HYDROPHOBIC PETROCHEMICAL SPONGE. MIN. 128 OZ. CAPACITY. TYPICAL, 2 PER CHAMBER.
17. **FABRIC SEAL** - U.V. RESISTANT GEOTEXTILE - **TO BE REMOVED BY CUSTOMER** AT PROJECT COMPLETION. GRATED ONLY.
18. **MIN. 4' Ø DRILLED SHAFT.**
19. **BASE SEAL** -CONCRETE SLURRY
20. **6 PERFORATIONS MINIMUM PER FOOT, 2 ROWS MINIMUM.**
21. NOT USED.
22. **DUAL INTAKE SCREEN - 4" Ø** SCH. 40 PVC 0.120" MODIFIED SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/ FT. OVERALL LENGTH WITH TRI-B COUPLER PER DETAIL, REFER TO "DETAIL A" HEREON.
23. **VENTED ANTI-SIPHON INTAKE WITH FLOW REGULATOR.**
24. **CONNECTOR PIPE - 4" Ø** SCH. 40 PVC.
27. **4" Ø SCH. 40 PVC TEE**



BIORETENTION FACILITY - TYPICAL CROSS SECTION
NTS



UNDERGROUND SYSTEM #1
SCALE: 1"=20'



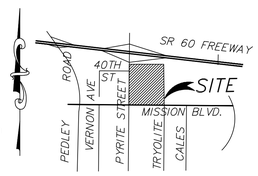
UNDERGROUND SYSTEM #2
SCALE: 1"=20'

LEGEND

AC.	ACRES
CB	CATCH BASIN
C.L. C/L	CENTERLINE
EX	EXISTING
EG	EXISTING GROUND
FG	FINISH GRADE
F.L.	FLOW LINE
SD	STORM DRAIN
SF	SQUARE FEET
NTS	NOT TO SCALE
DMA	DRAINAGE MANAGEMENT AREA
DA	DRAINAGE AREA
PROP.	PROPOSED
W.Q.	WATER QUALITY
R.C.B.	REINFORCED CONCRETE BOX
R.C.P.	REINFORCED CONCRETE PIPE
R/W	RIGHT OF WAY
T.C.	TOP OF CURB

OWNER/DEVELOPER
PANORAMA DEVELOPMENT
2005 WINSTON COURT
UPLAND, CA 91784
CONTACT: WES FIFIELD
NUMBER: 909.931.3363

CIVIL ENGINEER
MADOLE & ASSOCIATES, INC.
9302 PITTSBURGH AVENUE, SUITE 230
RANCHO CUCAMONGA, CA 91730
CONTACT: JEFFREY RUPP
NUMBER: 909.481.6322



VICINITY MAP
NO SCALE

APN: 171-020-001; 171-020-025

THE SHOPS AT JURUPA VALLEY
NEC MISSION BLVD AT PYRITE STREET
CITY OF JURUPA VALLEY, CA.

McKently Malak ARCHITECTS
35 Hugus Alley, Suite 200
Pasadena, California 91103-3648
TEL 626.583.8348 FAX 626.583.8387

DATE	BY	MARK	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

PREPARED UNDER THE SUPERVISION OF:

MADOLE & ASSOCIATES, INC.
Engineering Communities for Life

9302 PITTSBURGH AVE, SUITE 230
RANCHO CUCAMONGA, CA. 91730
PHONE: 909.481.6322
FAX: 909.481.6320

PRELIMINARY WQMP EXHIBIT
FOR TPM 37890

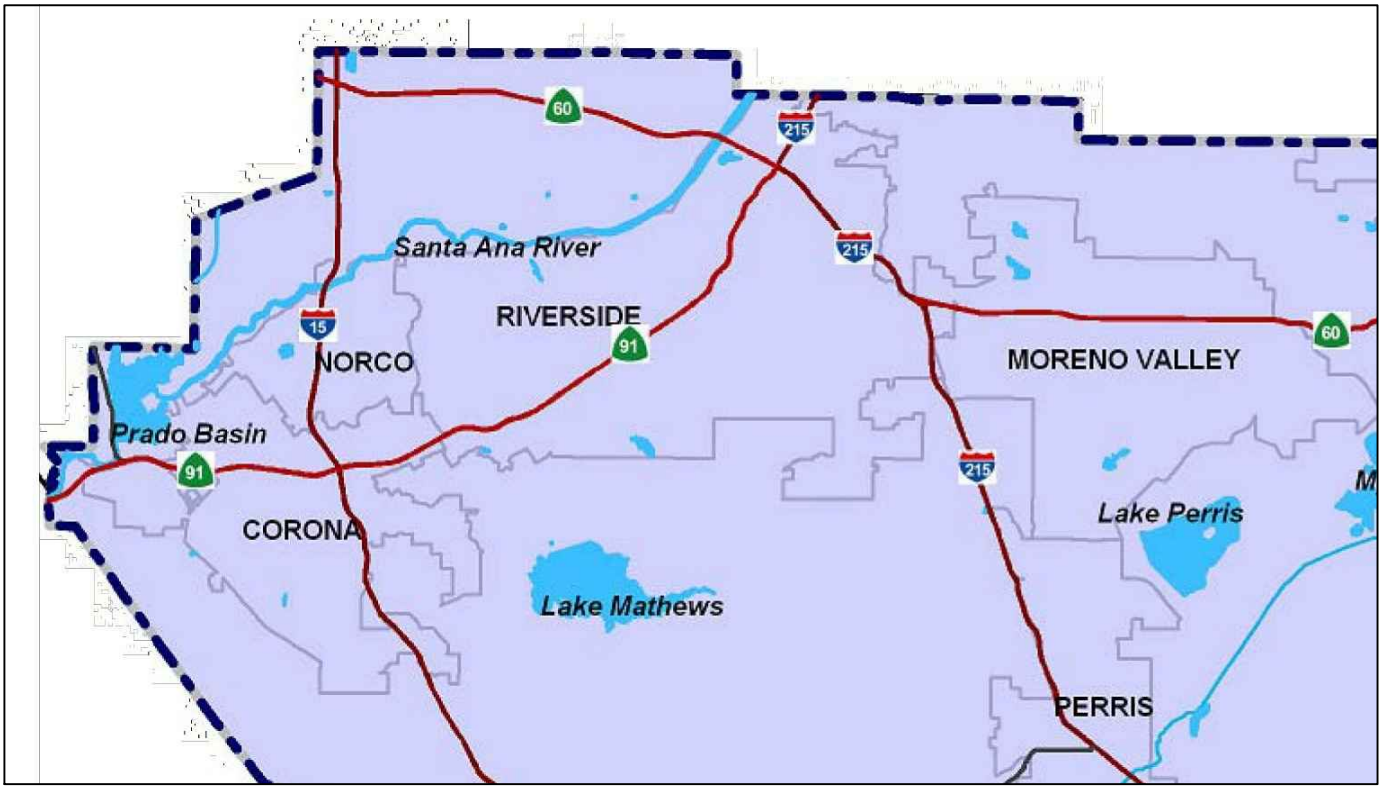
CITY OF JURUPA VALLEY

SHEET NO. 1 OF 1 SHEETS
PLAN NUMBER TPM____

J.N. 795-2849; TENTATIVE PARCEL MAP 37890

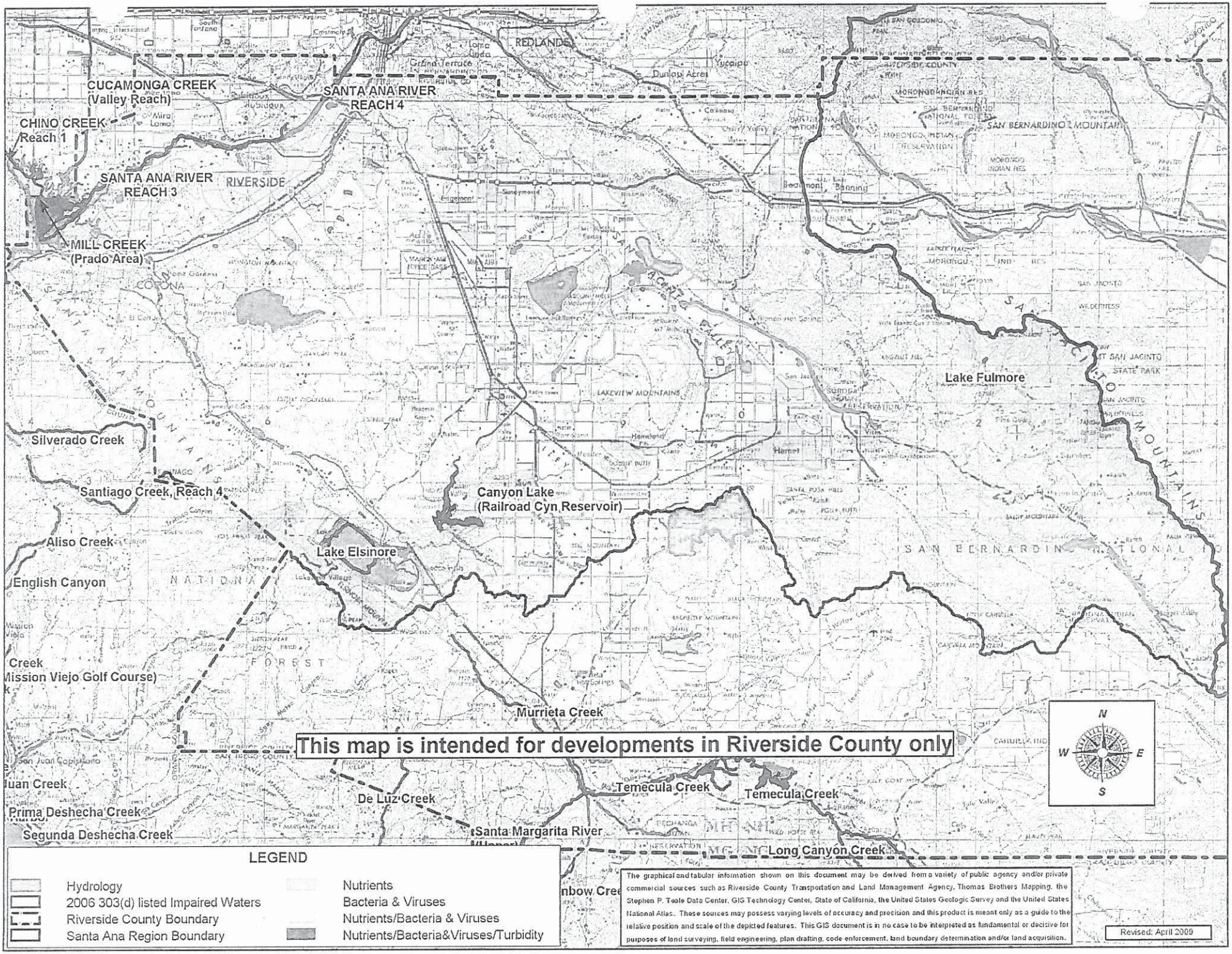
DRAWING PATH J:\795-2849\WQMP\WQMP_Exhibit.dwg

THE SHOPS AT JURUPA VALLEY
DOWNSTREAM WATER BODIES



ZONE 1

SANTA ANA RIVER REACH 3
PRADO FLOOD CONTROL BASIN
SANTA ANA RIVER REACH 2
SANTA ANA RIVER REACH 1
TIDAL PRISM OF SANTA ANA RIVER AND NEWPORT SLOUGH


CUCAMONGA CREEK
(Valley Reach)
SANTA ANA RIVER
REACH 4
CHINO CREEK
Reach 1
SANTA ANA RIVER
REACH 3
MILL CREEK
(Prado Area)
Lake Fulmore
Silverado Creek
Santiago Creek, Reach 4
Canyon Lake
(Railroad Cyn Reservoir)
Aliso Creek
Lake Elsinore
English Canyon
Murrieta Creek
This map is intended for developments in Riverside County only
Temecula Creek
Temecula Creek
De Luz Creek
Prima Deshecha Creek
Segunda Deshecha Creek
Santa Margarita River
Long Canyon Creek
N
W
E
S
LEGEND
Hydrology
2006 303(d) listed Impaired Waters
Riverside County Boundary
Santa Ana Region Boundary
Nutrients
Bacteria & Viruses
Nutrients/Bacteria & Viruses
Nutrients/Bacteria&Viruses/Turbidity
The graphical and tabular information shown on this document may be derived from a variety of public agency and/or private commercial sources such as Riverside County Transportation and Land Management Agency, Thomas Brothers Mapping, the Stephen P. Teale Data Center, GIS Technology Center, State of California, the United States Geologic Survey and the United States National Atlas. These sources may possess varying levels of accuracy and precision and this product is meant only as a guide to the relative position and scale of the depicted features. This GIS document is in no case to be interpreted as fundamental or decisive for purposes of land surveying, field engineering, plan drafting, code enforcement, land boundary determination and/or land acquisition.
Revised: April 2009

R 07 W | R 06 W | R 05 W | R 04 W | R 03 W | R 02 W | R 01 W | R 01 E | R 02 E | R 03 E | R 04 E | R 05 E

T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S

06	05	04	03	02	01
07	08	09	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

0.85 MiraLoma
0.61 Riverside North
0.54 Riverside South
0.68 PigeonPass
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.90 HurkeyCreek
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley

Santa Ana River Watershed
Santa Margarita Watershed

JURUPA VALLEY | EASTVALE | NORCO | CORONA | RIVERSIDE | MORENO VALLEY | CALIMESA | BEAUMONT | SAN JACINTO | PERRIS | CANYON LAKE | LAKE ELSINORE | WILDOMAR | MENIFEE | HEMET | MURRIETA | TEMECULA

N

Rain Gage Locations

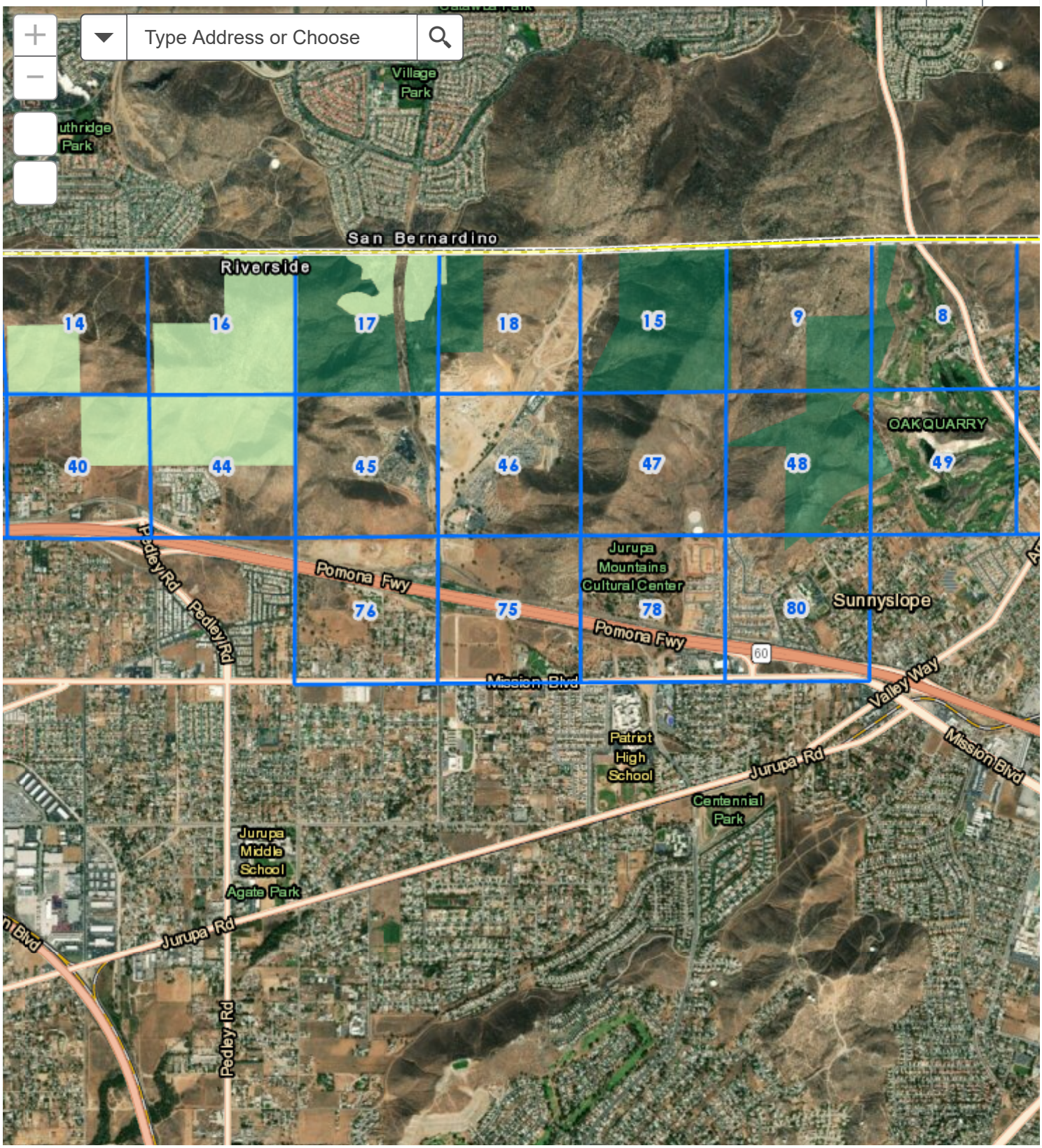
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011

RCA MSHCP Information Map

(Please click on map for more information)



0.6mi

-117.408 34.016 Degrees

Middle Santa Ana River Watershed Fact Sheet

The tributary drainage area to the Middle Santa Ana River Watershed is 480 square miles. Major tributaries to the Santa Ana River (Reaches 3 and 4) include: Temescal Creek (Reaches 1-6), Day Creek, San Sevaine Channel,. Box Springs Channel, and Anza Channel.

The Stormwater and Water Conservation Tracking Tool (Geodatabase) located here: **http://rivco.permitrack.com/**

MS4 Permittees: RCFC&WCD, County of Riverside, and Cities of Riverside, Corona, Norco, Eastvale and Jurupa Valley.

Landuse Data:

Population (2010 census data): 586,598 people

Percent Approximate Land Use by Category: Open (Forest Service, Parks, Open Space)- 55% , Commercial/Industrial-7%, Residential (Rural, Urban)-35%, Agriculture-3%

Regional Imperviousness Approximate Percentage: 42 % impervious, 58% pervious

Waterbodies: Santa Ana River, Day Creek, Temescal Creek, Coldwater Canyon Creek, Bedford Canyon Creek, Dawson Canyon Creek, San Timoteo Wash, Little San Gorgonio Creek, Anza Channel, Sunnyslope Channel, Tequesquite Arroyo (Sycamore Creek), Chino Creek, Mill Creek, Cucamonga Creek, Lake Evans, Lake Mathews, Lee Lake, Lake Norconian, and Mockingbird Reservoir

Habitat Areas: Refer to the U.S. Fish and Wildlife Critical Habitat, Western Region Multiple Species Habitat Conservation Plan (WRMSHCP) Potential Survey Areas, and Stephens Kangaroo Rat Habitat Conservation Plan (SKRHCP) layers in the Geodatabase (http://rivco.permitrack.com/).

Groundwater Basins: Refer to the Groundwater Data layers in the Geodatabase (http://rivco.permitrack.com/)

Development requirements: Follow the October 22, 2012 WQMP guidelines locate at http://rcflood.org/NPDES/SantaAnaWS.aspx#SAdocs

Drainage Channels: Refer to the Stormwater Data layer for District facilities and City Storm Drains in the Geodatabase (http://rivco.permitrack.com/)

Beneficial Uses: Refer to the Santa Ana Region Board website for updates to Beneficial Uses (http://www.swrcb.ca.gov/santaana/water_issues/programs/basin_plan/index.shtml)

Watershed Management Areas	Beneficial Uses
Santa Ana River, Reach 3,	AGR, GWR, REC1, REC2, WARM, WILD, RARE, SPWN
Santa Ana River, Reach 4	GWR, REC1, REC2, WARM, WILD, RARE, SPWN

Day Creek	MUN, PROC, GWR, REC1, REC2, COLD, WILD
Cucamonga Creek, Reach 1	GWR, REC2, LWRM, WILD
Mill Creek (Prado Area)	REC1, REC2, WARM, WILD, RARE
San Timoteo Wash Reach 3	GWR, REC1, REC2, WARM, WILD
Little San Gorgonio Creek	MUN, GWR, REC1, REC2, COLD, WILD
Anza Park Drain	MUN, REC1, REC2, WARM, WILD, SPWN
Sunnyslope Channel	MUN, REC1, REC2, WARM, WILD, RARE, SPWN
Tequesquite Arroyo (Sycamore Creek)	GWR, REC1, REC2, WARM, WILD, SPWN
Chino Creek, Reach 1A	REC1, REC2, WARM, WILD, RARE
Chino Creek, Reach 1B	REC1, REC2, WARM, WILD, RARE
Temescal Creek – Reach 1a	REC2, WARM, WILD
Temescal Creek – Reach 1b	REC2, WARM, WILD
Temescal Creek – Reach 2	AGR, IND, GWR, REC1, REC2, WARM, WILD
Temescal Creek – Reach 3	**See Lee Lake**
Temescal Creek – Reach 4	AGR, GWR, REC1, REC2, WARM, WILD, RARE
Temescal Creek – Reach 5	AGR, GWR, REC1, REC2, WARM, WILD, RARE
Temescal Creek – Reach 6	INTERMITTENT - GWR, REC1, REC2, WARM, WILD
Coldwater Canyon Creek	MUN, AGR, GWR, REC1, REC2, WARM, WILD
Bedford Canyon Creek	INTERMITTENT - GWR, REC1, REC2, WARM, WILD
Dawson Canyon Creek	INTERMITTENT - MUN, GWR, REC1, REC2, WARM, WILD
Lake Evans	REC1, REC2, WARM, COLD, WILD
Lee Lake	AGR, IND, GWR, REC1, REC2, WARM, WILD
Lake Mathews	MUN, AGR, IND, PROC, GWR, REC1, REC2, WARM, WILD, RARE
Mockingbird Reservoir	AGR, REC1, REC2, WARM, WILD
Lake Norconian	REC1, REC2, WARM, WILD

2010 303(d) Impairments
(http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/303d/2010_303d.pdf):

Waterbody	**Pollutants**	**Potential Sources**
Chino Creek Reach 1A (Santa Ana River R5 cnfl to just downstream of confl with Mill Creek)	Nutrients Pathogens	Agriculture; Dairies Agriculture; Dairies; Urban Runoff/Storm Sewers
Cucamonga Creek Reach 1 (Valley Reach)	Cadmium Coliform Bacteria Copper Lead	Source Unknown Unknown Nonpoint Source Source Unknown Source Unknown

	Zinc	Source Unknown
Mill Creek (Prado Area)	Nutrients Pathogens Total Suspended Solids (TSS)	Agriculture; Dairies Dairies Dairies
Santa Ana River, Reach 3	Copper Lead Pathogens	Source Unknown Source Unknown Dairies
Santa Ana River, Reach 4	Pathogens	Non-point Source
Temescal Creek, Reach 1	pH	Source Unknown
Temescal Creek, Reach 6	Indicator Bacteria	Source Unknown

Approved TMDLs:

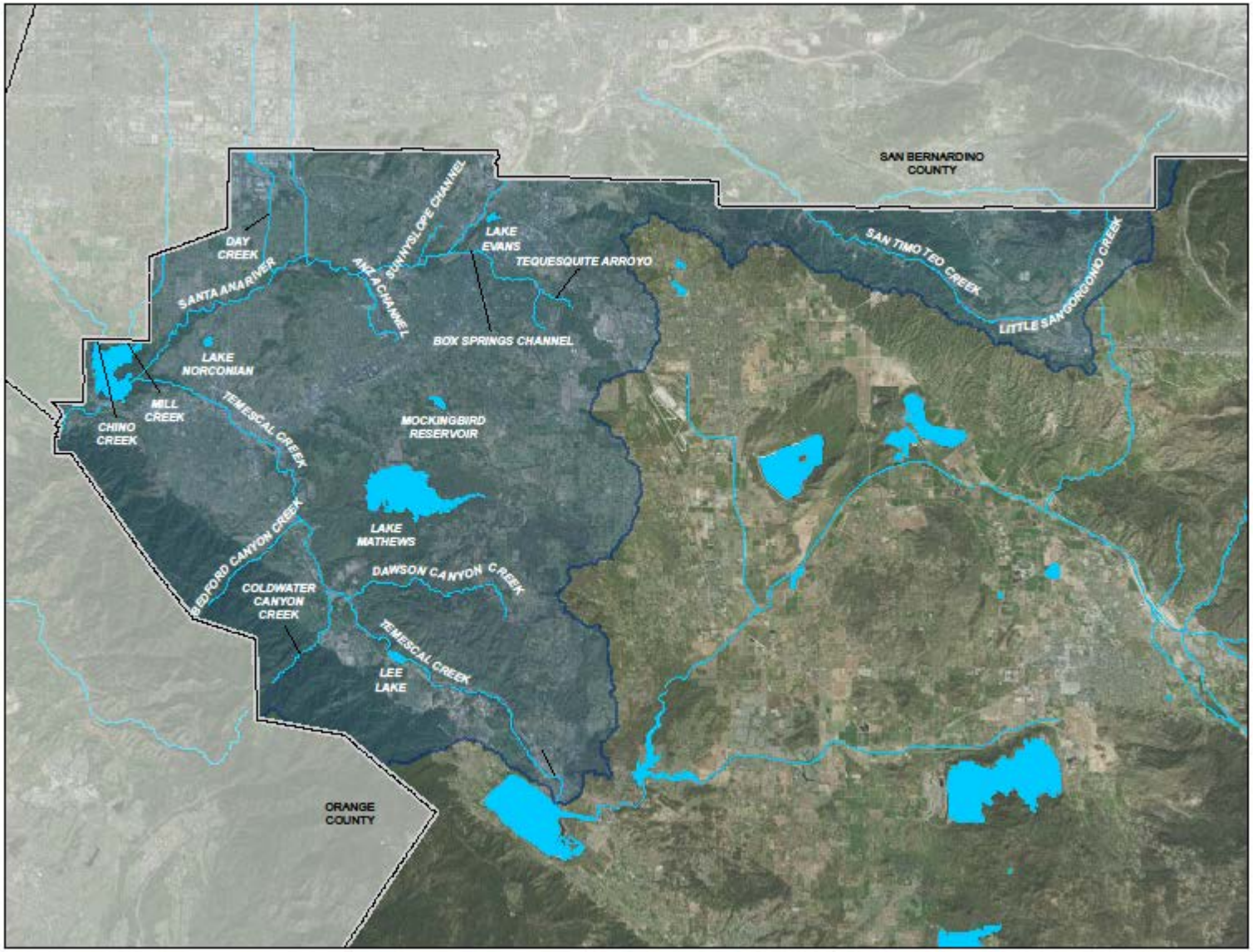
- **Santa Ana River, Reach 3**: Bacterial Indicators

A Comprehensive Bacteria Reduction Plan (CBRP), has been developed for the TMDL listed above and is located here: http://rcflood.org/downloads/NPDES/Documents/SA_Other/CBRP.pdf

Water Quality Objectives (mg/L): Refer to the Santa Ana Region Board website for updates to Water Quality Objectives (http://www.swrcb.ca.gov/santaana/water_issues/programs/basin_plan/index.shtml)

	Total Dissolved Solids	**Hardness**	**Sodium**	**Chloride**	**Total Inorganic Nitrogen**	**Sulfate**	**Chemical Oxygen Demand**
Santa Ana River Reach 3-Base Flow[1]	700	350	110	140	10[2]	150	30
Santa Ana River Reach 4	550	---	---	---	10	---	30
Day Creek	200	100	15	4	4	25	5
Little San Gorgonio Creek	230	125	50	40	3	45	5
Yucaipa Creek	290	175	60	60	6	45	15
Chino Creek Reach 1A-Base Flow[3]	700	350	110	140	10[4]	150	30
Chino Creek Reach 1B	550	240	75	75	8	60	15
Coldwater Canyon Creek	250	---	---	---	---	---	---
Lake Norconian	1050	---	---	---	---	---	---
Lake Evans	490	---	---	---	---	---	---
Lake Mathews	700	325	100	90	---	290	---
Mockingbird Reservoir	650	---	---	---	---	---	---

1. Additional Objectives: Boron 0.75 mg/l
2. Total nitrogen, filtered sample
3. Additional Objective: Boron 0.75 mg/l
4. Total nitrogen, filtered sample


SAN BERNARDINO COUNTY
DAY CREEK
SANTA ANA RIVER
SUNNYSLOPE CHANNEL
ANZA CHANNEL
LAKE EVANS
TEQUESQUITE ARROYO
SAN TIMOTEO CREEK
LITTLE SAN GORGONIO CREEK
BOX SPRINGS CHANNEL
LAKE NORCONIAN
MILL CREEK
CHINO CREEK
TEMESCAL CREEK
MOCKINGBIRD RESERVOIR
LAKE MATHEWS
BEDFORD CANYON CREEK
DAWSON CANYON CREEK
COLDWATER CANYON CREEK
TEMESCAL CREEK
LEE LAKE
ORANGE COUNTY

Appendix 2: Construction Plans

Grading and Drainage Plans

CONCEPTUAL GRADING PLAN

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

PERCOLATION REPORT

GEOTECHINICAL INVESTIGATION

Sladden Engineering

45090 Golf Center Parkway, Suite F, Indio, CA. 92201 (760) 863-0713 Fax (760) 863-0847
6782 Stanton Avenue, Suite C, Buena Park, CA. 90621 (714) 523-0952 Fax (714) 523-1369
450 Egan Avenue, Beaumont, CA. 92223 (951) 845-7743 Fax (951) 845-8863
800 E. Florida Avenue, Hemet, CA. 92543 (951) 766-8777 Fax (951) 766-8778

November 11, 2019

Project No. 644-19049
19-11-186

Panorama Development
2005 Winston Court
Upland, California 91784

Project: Proposed Commercial Development
The Shops at Jurupa Valley
NEC Pyrite Street and Mission Boulevard
Jurupa Valley, California

Subject: Percolation/Infiltration Testing for On-Site Storm Water Management

Ref: Geotechnical Investigation report prepared by Sladden Engineering dated October 28, 2019; Project No. 644-19049, Report No. 19-10-081

In accordance with your request, we have performed percolation/infiltration testing on the subject site to evaluate the infiltration potential of the near surface soil to assist in storm water management system design. It is our understanding that on-site storm water retention/infiltration is proposed for the project.

Percolation testing was performed on November 15, 2019 within four (4) test bores excavated on the site. Testing was performed at a depth of approximately 10 (P-2 & P-4) and 20 (P-1 & P-3) feet below existing grade. The approximate locations of the tests are presented on the attached Test Location Plan (Figure 1). Testing was performed by placing water within the test bores and recording the drop in the water surface with time. Testing was performed in general accordance with the *United States Bureau of Reclamation (BOR) Procedure 7300-89 (1999)*. Test results are summarized in the following table.

PERCOLATION/INFILTRATION TEST RESULTS

Test No.	Depth (Ft)	Percolation Rate (in/hr)	*Infiltration Rate (in/hr)
P-1	20.0	14.4	0.24
P-2	10.0	16.2	1.55
P-3	20.0	10.8	1.01
P-4	10.0	21.6	2.14

*Porchet Method

The percolation rates determined represent ultimate field rates that do not include a safety factor. The corresponding infiltration rates were calculated using the Porchet Method in accordance with Riverside County guidelines. An appropriate safety factor should be applied to account for long-term saturation, subsoil inconsistencies and the potential for silting of the percolating soil. The safety factor should be determined with consideration to other factors in the storm water retention system design (specifically storm water volume estimates) and the safety factors associated with these design components.

Groundwater was not encountered within our exploratory boreholes that extended to a maximum depth of approximately 51.5 feet on August 1, 2019. The presence of groundwater should not impact the design or performance of the storm water retention system.

If you have any questions regarding this memo, please contact the undersigned.

Respectfully submitted,
SLADDEN ENGINEERING

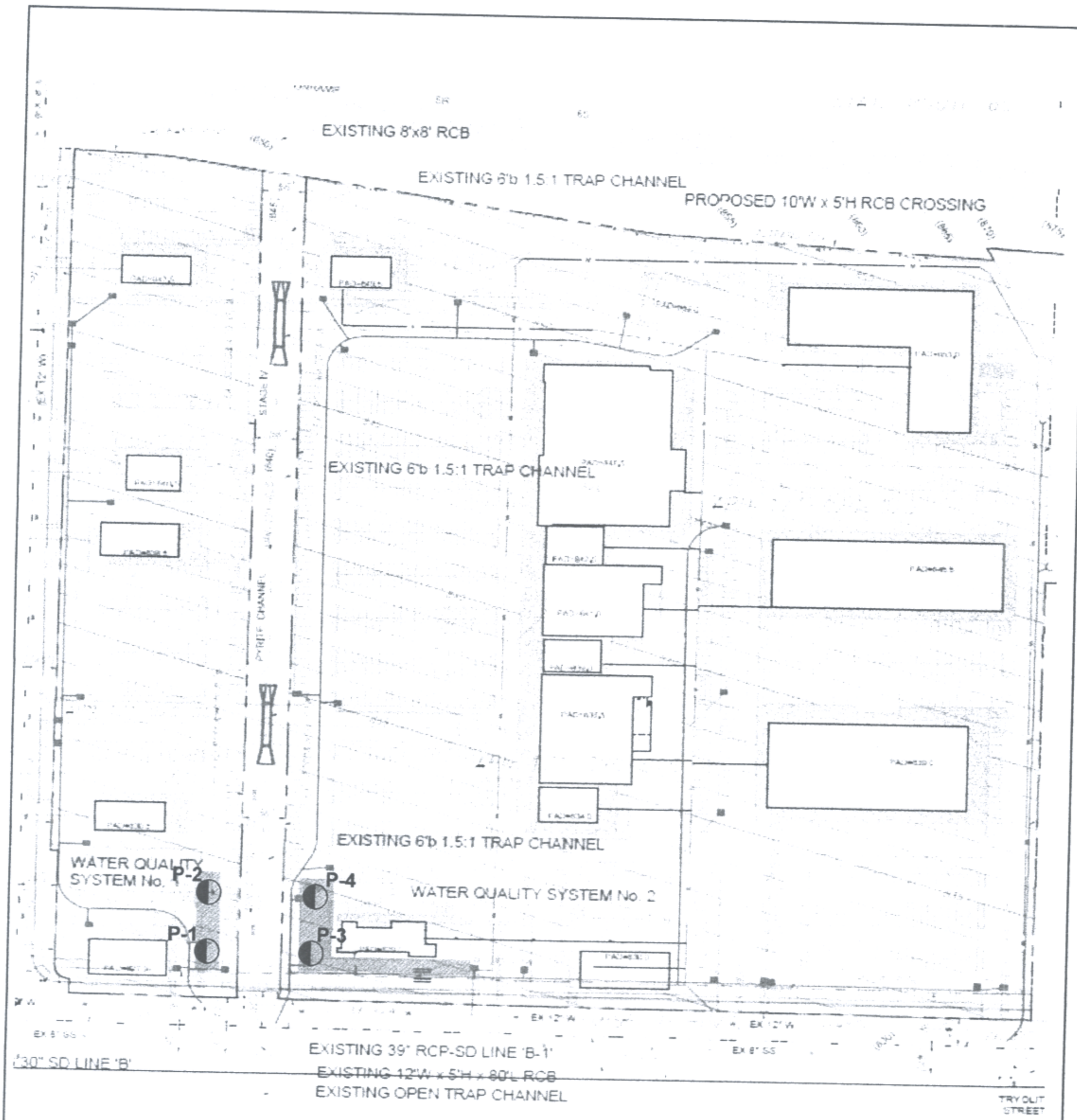
James W. Minor III
Senior Geologist

PROFESSIONAL GEOLOGIST
JAMES W. MINOR III
No. 9735
STATE OF CALIFORNIA

Brett L. Anderson
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
BRETT L. ANDERSON
No. C45389
CIVIL ENGINEERING
STATE OF CALIFORNIA

Copies: 4 / Addressee



Madole & Associates, Inc. (2019)

Sladden Engineering	TEST LOCATION PLAN		FIGURE 1
	Project Number:	644-19049	
	Report Number:	19-11-186	
	Date:	November 21, 2019	

STORMWATER PERCOLATION SHEET

Project: Proposed Commercial Development
Test Hole: P-1
Depth of Test Hole: 20.0 Feet
Check for Sandy Soil Criteria Tested by: J. Minor
Actual Percolation Tested by: R.Farabough

Job No: 644-19049
Date Excavated: 11/6/19
Soil Classification: SC
Date: 11/6/19
Date: 11/15/19

Reading Number	Time of Reading	Time Interval Minutes	Total Depth of Hole (ft)	Initial Water Level (in)	Final Water Level (in)	Difference Water Level (in)
*A	9:00	25	20.0	20.0	8.9	11.1
*B	9:27	25	20.0	20.3	12.8	7.5
1.	9:39	10	20.0	20.1	14.7	5.4
2.	9:41	10	20.0	20.2	15.4	4.8
3.	9:53	10	20.0	20.6	16.1	4.5
4.	10:05	10	20.0	20.1	16.6	3.5
5.	10:17	10	20.0	20.0	17.1	2.9
6.	10:29	10	20.0	20.3	17.3	3.0
7.	10:41	10	20.0	21.2	16.9	4.3
8.	10:53	10	20.0	21.1	17.2	3.9
9.	11:05	10	20.0	20.8	17.4	3.4
10.	11:27	10	20.0	20.3	17.5	2.8
11.	11:39	10	20.0	20.1	17.7	2.4
12.	11:51	10	20.0	20.0	17.6	2.4

Test Hole to be filled to 5 times the hole radius.
*2 (25 min) readings-
If 6 inches seeps away = sandy soil; 10 min readings for one hour.
If <6 inches seeps away, presoak; 30 min readings for 6 hours.

STORMWATER PERCOLATION SHEET

Project: Proposed Commercial Development
Test Hole: P-2
Depth of Test Hole: 10.0 Feet
Check for Sandy Soil Criteria Tested by: J. Minor
Actual Percolation Tested by: R.Farabough

Job No: 644-19049
Date Excavated: 11/6/19
Soil Classification: SC
Date: 11/6/19
Date: 11/15/19

Reading Number	Time of Reading	Time Interval Minutes	Total Depth of Hole (ft)	Initial Water Level (in)	Final Water Level (in)	Difference Water Level (in)
*A	9:05	25	10.0	20.0	9.0	11.0
*B	9:35	25	10.0	20.5	9.5	11.0
1.	9:47	10	10.0	20.3	12.3	8.0
2.	9:59	10	10.0	20.1	15.0	5.1
3.	10:11	10	10.0	20.6	15.2	5.4
4.	10:23	10	10.0	20.1	15.0	5.1
5.	10:35	10	10.0	20.3	16.4	3.9
6.	10:47	10	10.0	20.9	16.7	4.2
7.	10:59	10	10.0	21.6	16.7	4.9
8.	11:11	10	10.0	20.0	17.2	2.8
9.	11:23	10	10.0	20.1	17.0	3.1
10.	11:35	10	10.0	21.1	17.8	3.3
11.	11:47	10	10.0	20.1	17.3	2.8
12.	11:59	10	10.0	20.2	17.5	2.7

Test Hole to be filled to 5 times the hole radius.
*2 (25 min) readings-
If 6 inches seeps away = sandy soil; 10 min readings for one hour.
If <6 inches seeps away, presoak; 30 min readings for 6 hours.

STORMWATER PERCOLATION SHEET

Project: Proposed Commercial Development
Test Hole: P-3
Depth of Test Hole: 20.0 Feet
Check for Sandy Soil Criteria Tested by: J. Minor
Actual Percolation Tested by: R.Farabough

Job No: 644-19049
Date Excavated: 11/6/19
Soil Classification: SC
Date: 11/6/19
Date: 11/15/19

Reading Number	Time of Reading	Time Interval Minutes	Total Depth of Hole (ft)	Initial Water Level (in)	Final Water Level (in)	Difference Water Level (in)
*A	11:40	25	20.0	20.4	10.4	10.0
*B	12:10	25	20.0	20.0	10.7	9.3
1.	12:22	10	20.0	20.0	15.6	4.4
2.	12:34	10	20.0	20.5	17.3	3.2
3.	12:46	10	20.0	20.1	17.0	3.1
4.	12:58	10	20.0	20.6	17.3	3.3
5.	1:10	10	20.0	21.4	17.6	3.8
6.	1:22	10	20.0	20.3	17.9	2.4
7.	1:34	10	20.0	20.3	18.3	2.0
8.	1:46	10	20.0	20.0	18.0	2.0
9.	1:58	10	20.0	20.1	18.1	2.0
10.	2:10	10	20.0	20.4	18.8	1.6
11.	2:22	10	20.0	20.1	18.3	1.8
12.	2:34	10	20.0	20.3	18.5	1.8

Test Hole to be filled to 5 times the hole radius.
*2 (25 min) readings-
If 6 inches seeps away = sandy soil; 10 min readings for one hour.
If <6 inches seeps away, presoak; 30 min readings for 6 hours.

STORMWATER PERCOLATION SHEET

Project: Proposed Commercial Development
Test Hole: P-4
Depth of Test Hole: 10.0 Feet
Check for Sandy Soil Criteria Tested by: J. Minor
Actual Percolation Tested by: R.Farabough

Job No: 644-19049
Date Excavated: 11/6/19
Soil Classification: SC
Date: 11/6/19
Date: 11/15/19

Reading Number	Time of Reading	Time Interval Minutes	Total Depth of Hole (ft)	Initial Water Level (in)	Final Water Level (in)	Difference Water Level (in)
*A	11:45	25	10	20.4	9.0	11.4
*B	12:15	25	10	20.1	9.0	11.1
1.	12:27	10	10	20.3	12.8	7.5
2.	12:39	10	10	20.6	13.0	7.6
3.	12:51	10	10	21.5	14.1	7.4
4.	1:03	10	10	21.0	14.5	6.5
5.	1:15	10	10	20.3	14.9	5.4
6.	1:27	10	10	20.6	16.0	4.6
7.	1:39	10	10	20.4	16.1	4.3
8.	1:51	10	10	20.5	16.2	4.3
9.	2:03	10	10	20.0	16.3	3.7
10.	2:15	10	10	20.1	16.5	3.6
11.	2:27	10	10	20.3	16.4	3.9
12.	2:39	10	10	20.0	16.4	3.6

Test Hole to be filled to 5 times the hole radius.
*2 (25 min) readings-
If 6 inches seeps away = sandy soil; 10 min readings for one hour.
If <6 inches seeps away, presoak; 30 min readings for 6 hours.

PERCOLATION RATE CONVERSION (PORCHET METHOD)

$$I_{t=} \quad \frac{\Delta H\ 60\ R}{\Delta t(r+2H_{avg})}$$

Δt (minutes)

D_f (Final Depth to water)

r (hole radius in inches)

D_0 (Initial Depth to water)

D_t (Total Depth of test hole)

H_0 (initial height of water at selected time interval)

$$H_0 = D_t - D_0$$

H_f (final height of water at the selected time interval)

$$H_f = D_t - D_f$$

ΔH (change in head over the time interval)

$$\Delta H = H_0 - H_f$$

H_{avg} (average head height over the time interval)

$$H_{avg} = (H_0 + H_f)/2$$

Test Hole: **P-1**

Δt =	10
D_f =	222.4
r =	4.00
D_0 =	220
D_t =	340.00
H_0 =	120
H_f =	117.6
ΔH =	2.40
H_{avg} =	118.80

I_t= 0.24 in/hr

PERCOLATION RATE CONVERSION (PORCHET METHOD)

$$I_{t=} \quad \frac{\Delta H\ 60\ R}{\Delta t(r+2H_{avg})}$$

Δt (minutes)

D_f (Final Depth to water)

r (hole radius in inches)

D_0 (Initial Depth to water)

D_t (Total Depth of test hole)

H_0 (initial height of water at selected time interval)

$$H_0 = D_t - D_0$$

H_f (final height of water at the selected time interval)

$$H_f = D_t - D_f$$

ΔH (change in head over the time interval)

$$\Delta H = H_0 - H_f$$

H_{avg} (average head height over the time interval)

$$H_{avg} = (H_0 + H_f)/2$$

Test Hole: **P-2**

Δt =	10
D_f =	102.5
r =	4.00
D_0 =	99.8
D_t =	120.00
H_0 =	20.2
H_f =	17.5
ΔH =	2.70
H_{avg} =	18.85

I_t= 1.55 in/hr

PERCOLATION RATE CONVERSION (PORCHET METHOD)

$$I_{t=} \quad \frac{\Delta H\ 60\ R}{\Delta t(r+2H_{avg})}$$

Δt (minutes)

D_f (Final Depth to water)

r (hole radius in inches)

D_0 (Initial Depth to water)

D_t (Total Depth of test hole)

H_0 (initial height of water at selected time interval)

$$H_0 = D_t - D_0$$

H_f (final height of water at the selected time interval)

$$H_f = D_t - D_f$$

ΔH (change in head over the time interval)

$$\Delta H = H_0 - H_f$$

H_{avg} (average head height over the time interval)

$$H_{avg} = (H_0 + H_f)/2$$

Test Hole: **P-3**

Δt =	10
D_f =	221.5
r =	4.00
D_0 =	219.7
D_t =	240.00
H_0 =	20.3
H_f =	18.5
ΔH =	1.80
H_{avg} =	19.40

I_t= 1.01 in/hr

PERCOLATION RATE CONVERSION (PORCHET METHOD)

$$I_{t=} \quad \frac{\Delta H\ 60\ R}{\Delta t(r+2H_{avg})}$$

Δt (minutes)

D_f (Final Depth to water)

r (hole radius in inches)

D_0 (Initial Depth to water)

D_t (Total Depth of test hole)

H_0 (initial height of water at selected time interval)

$$H_0 = D_t - D_0$$

H_f (final height of water at the selected time interval)

$$H_f = D_t - D_f$$

ΔH (change in head over the time interval)

$$\Delta H = H_0 - H_f$$

H_{avg} (average head height over the time interval)

$$H_{avg} = (H_0 + H_f)/2$$

Test Hole: **P-4**

Δt =	10
D_f =	103.6
r =	4.00
D_0 =	100
D_t =	120.00
H_0 =	20
H_f =	16.4
ΔH =	3.60
H_{avg} =	18.20

I_t= 2.14 in/hr

GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL DEVELOPMENT
THE SHOPS AT JURUPA VALLEY
NEC PYRITE STREET AND MISSION BOULEVARD
JURUPA VALLEY, CALIFORNIA

-Prepared By-

Sladden Engineering

450 Egan Avenue
Beaumont, California 92223
(951)845-7743

Sladden Engineering

45-090 Golf Center Parkway, Suite F, Indio, CA 92201 (760) 772-3893 Fax (760) 772-3895
6782 Stanton Avenue, Suite C, Buena Park, CA 90621 (714) 523-0952 Fax (714) 523-1369
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863
800 E. Florida Avenue, Hemet, CA 92543 (951) 766-8777 Fax (951) 766-8778

October 28, 2019

Project No. 644-19049
19-10-081

Panorama Development
2005 Winston Court
Upland, California 91784

Subject: Geotechnical Investigation

Project: Proposed Commercial Development
The Shops at Jurupa Valley
NEC Pyrite Street and Mission Boulevard
Jurupa Valley, California

Sladden Engineering is pleased to present the results of our geotechnical investigation performed for the commercial development proposed for the subject site located on the northeast corner Pyrite Street and Mission Boulevard in the City of Jurupa Valley, California. Our services were completed in accordance with our proposal for geotechnical engineering services dated August 14, 2019 and your authorization to proceed with the work. The purpose of our investigation was to explore the subsurface conditions at the site in order to provide recommendations for foundation design and site preparation. Evaluation of environmental issues and hazardous wastes was not included within the scope of services provided.

The opinions, recommendations and design criteria presented in this report are based on our field exploration program, laboratory testing and engineering analyses. Based on the results of our investigation, it is our professional opinion that the proposed project should be feasible from a geotechnical perspective provided that the recommendations presented in this report are implemented into design and carried out through construction.

We appreciate the opportunity to provide service to you on this project. If you have any questions regarding this report, please contact the undersigned.

Respectfully submitted,
SLADDEN ENGINEERING

Matthew J. Cohrt
Principal Geologist

Brett L. Anderson
Principal Engineer

SER/mc

Copies: 4/Addressee

GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL DEVELOPMENT
THE SHOPS AT JURUPA VALLEY
NEC PYRITE STREET AND MISSION BOULEVARD
JURUPA VALLEY, CALIFORNIA

TABLE OF CONTENTS

INTRODUCTION

This report presents the results of the geotechnical investigation performed by Sladden Engineering (Sladden) for the commercial development proposed for the subject site located on the northeast corner of Pyrite Street and Mission Boulevard in the City of Jurupa Valley, California. The site is located at approximately 34.0133 degrees North latitude and 117.4600 degrees West longitude. The approximate location of the site is indicated on the Site Location Map (Figure 1).

Our investigation was conducted in order to evaluate the engineering properties of the subsurface materials, to evaluate their *in-situ* characteristics, and to provide engineering recommendations and design criteria for site preparation, foundation design and the design of various site improvements. This study also includes a review of published and unpublished geotechnical and geological literature regarding seismicity at and near the subject site.

PROJECT DESCRIPTION

Based on the provided Site Plan (MM Architect, 2019), it is our understanding that the proposed project will consist of constructing a total of 13 new structures on the subject site. The proposed structures will consist of six (6) restaurant/drive through buildings ranging in size from 3,600 square feet (ft^2) to 4,600 ft^2, a gas station with convenience store occupying approximately 3,500 ft^2, new retail space occupying 66,000 ft^2, a car wash building occupying 4,801 ft^2, an auto repair facility occupying 6,009 ft^2, a new movie theater occupying 38,391 ft^2, a medical/office building occupying 28,500 ft^2 and a new two-story Hotel occupying approximately 28,800 ft^2. For our analyses, we expect that the proposed new commercial structures will consist of relatively lightweight wood-frame, steel-frame or reinforced masonry structures supported on conventional shallow spread footings and a concrete slab-on-grade floor system. We anticipate that proposed gas station will include a fuel canopy that will be supported on a cast-in-place concrete drilled pier foundation system.

Based on the relatively level nature of the site, Sladden expects that grading will be limited to minor cuts and fills in order to accomplish the required pad elevations and to provide adequate gradients for site drainage. This does not include the removal and re-compaction of the loose surface soil and primary foundation bearing soil within the proposed building areas. Upon completion of precise grading plans, Sladden should be retained in order to verify that the recommendations presented within in this report are properly incorporated into the design of the proposed project.

Structural foundation loads were not available at the time of this report. Based on our experience with relatively lightweight wood-frame, steel-frame and reinforced masonry structures, we expect that isolated column loads will be less than 50 kips and continuous wall loads will be less than 5.0 kips per linear foot. If these assumed loads vary significantly from the actual loads, we should be consulted to verify the applicability of the recommendations provided.

SCOPE OF SERVICES

The purpose of our investigation was to determine specific engineering characteristics of the surface and near surface soil in order to develop foundation design criteria and recommendations for site preparation. Exploration of the site was achieved by drilling seven (7) exploratory boreholes to depths between approximately 16 and 26 feet below the existing ground surface (bgs). Specifically, our site characterization consisted of the following tasks:

- Site reconnaissance to assess the existing surface conditions on and adjacent to the site.
- The excavation of seven (7) exploratory boreholes to depths varying from approximately 16 to 26 feet bgs in order to characterize the subsurface soil conditions. Representative samples of the soil were classified in the field and retained for laboratory testing and engineering analyses.
- The performance of laboratory testing on selected samples to evaluate their engineering characteristics.
- The review of geologic literature with respect to potential geologic hazards.
- The performance of engineering analyses to develop recommendations for foundation design and site preparation.
- The preparation of this report summarizing our work at the site.

SITE CONDITIONS

The site is located on the northeast corner of Pyrite Street and Mission Boulevard in the City of Jurupa Valley, California. The site consists of two parcels occupying a combined total area of approximately 31.5 acres. The subject property is formally identified by the County of Riverside as APNs 171-020-001 and 171-020-025. Pyrite Channel separates the two parcels in a north-south orientation. The subject property is undeveloped and covered in scattered low growth vegetation and trees and is transected by several dirt roads and trails. The site is bounded by Mission Boulevard to the south, Pyrite Street to the west, Highway 60 east bound onramp to the north and residential properties to the east.

The project site is relatively level with minimal surface gradients. According to the USGS 7.5′ Fontana West Quadrangle map (USGS, 2015), site elevations range from approximately 825 to 870 feet above mean sea level (MSL). Generally, surface gradients across the site descend to the southwest.

No ponding water or surface seeps were observed at or near the site during our investigation conducted on October 2, 2019. Site drainage is controlled by sheet flow, surface infiltration and within City and/or County maintained Pyrite Channel that transects the site.

GEOLOGIC SETTING

The project site is located in the northern portion of the Peninsular Ranges Physiographic Province of California. The Peninsular Ranges are mountainous areas that extend from the western edge of the continental borderland to the Salton Trough and from the Transverse Ranges Physiographic Province in the north to the tip of Baja California in the south. The province is characterized by elongated, northwest-southeast trending mountain ranges and valleys and is truncated at its northern margin by the east-west grain of the Transverse Ranges.

The site has been mapped by Morton (2003) to be immediately underlain by Pleistocene-age older alluvial fan deposits (Qof). The geologic setting for the site and site vicinity is presented on the Regional Geologic Map (Figure 2).

SUBSURFACE CONDITIONS

The subsurface conditions at the site were investigated by drilling seven (7) exploratory boreholes on the site. The approximate locations of the boreholes are illustrated on the Borehole Location Photograph (Figure 3). The boreholes were advanced using a truck-mounted Mobile B-61 drill-rig equipped with 8-inch outside diameter hollow stem augers. A representative of Sladden was on-site to log the materials encountered and retrieve samples for laboratory testing and engineering analyses.

During our field investigation, disturbed soil underlain by native alluvial materials were encountered. Disturbed soil was encountered near the surface within each of our bores and was generally less than two (2) feet in depth. The native older alluvium consists primarily of interbedded silty sand (SM), sand (SW/SP) and clayey sand (SC). Sampler penetration resistance as measured by field blow counts indicates that density generally increases with depth.

The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and tests of the field samples. The final logs are included in Appendix A of this report. The stratification lines represent the approximate boundaries between soil types although the transitions may be gradual and/or variable across the site.

Groundwater was not encountered within our boreholes. Based upon our bores and our review of CDWR (2019), it is our opinion that groundwater is at a sufficient depth as not to be a factor during construction of the proposed project. The following table summarizes the groundwater depths in the site vicinity as available through the California Department of Water Resources (CDWR, 2019).

TABLE 1
DEPTH TO GROUNDWATER

WELL NO	DISTANCE/DIRECTION	DEPTH TO GW	DATE
339950N1174230W001	2.5 miles/SE	67.18	10/31/2011
340040N1175131W001	3.10 miles /SW	63.8	07/01/1922
340233N1175215W001	3.60 miles /NW	216.3	01/28/1997

SEISMICITY AND FAULTING

The southwestern United States is a tectonically active and structurally complex region, dominated by northwest trending dextral faults. The faults of the region are often part of complex fault systems, composed of numerous subparallel faults that splay or step from the main fault traces. Strong seismic shaking could be produced by any of these faults during the design life of the proposed project.

We consider the most significant geologic hazard to the project to be the potential for moderate to strong seismic shaking that is likely to occur during the design life of the project. The proposed project is located in the highly seismic Southern California region within the influence of several fault systems that are considered to be active or potentially active. An active fault is defined by the State of California as a "sufficiently active and well defined fault" that has exhibited surface displacement within the Holocene epoch (about the last 11,000 years). A potentially active fault is defined by the State as a fault with a history of movement within Pleistocene time (between 11,000 and 1.6 million years ago).

Table 2 lists the closest known active faults that were generated in part using the EQFAULT computer programs (Blake, 2000), as modified using the fault parameters from The Revised 2002 California Probabilistic Seismic Hazard Maps (Cao et al, 2003). This table does not identify the probability of reactivation or the on-site effects from earthquakes occurring on any of the other faults in the region.

TABLE 2
CLOSEST KNOWN ACTIVE FAULTS

Fault Name	Distance (Km)	Maximum Event
San Jacinto – San Bernardino	14.4	6.7
Cucamonga	18.3	6.9
Chino – Central Ave. (Elsinore)	20.1	6.7
San Jacinto – San Jacinto Valley	20.6	6.9
San Jose	24.0	6.4
Whittier	24.1	6.8
Elsinore – Glen Ivy	24.1	6.8
San Andreas – Southern	25.6	7.2
San Andreas – San Bernardino	25.6	7.5

2016 CBC SEISMIC DESIGN PARAMETERS

Sladden has reviewed the 2016 California Building Code (CBC) and summarized the current seismic design parameters for the proposed structures. The seismic design category for a structure may be determined in accordance with Section 1613 of the 2016 CBC or ASCE7. According to the 2016 CBC, Site Class C may be used to estimate design seismic loading for the proposed structures. The 2016 CBC Seismic Design Parameters are summarized below (SEA, 2019). The project Design Map Reports are included within Appendix C.

Risk Category (Table 1.5-1)	II
Site Class (Table 1613.3.2)	C
Ss (Figure 1613.3.1)	1.500g
S1 (Figure 1613.3.1)	0.600g
Fa (Table 1613.3.3(1))	1.0
Fv (Table 1613.5.3(2))	1.3
Sms (Equation 16-37 {Fa X Ss})	1.500g
Sm1 (Equation 16-38 {Fv X S1})	0.780g
SDS (Equation 16-39 {2/3 X Sms})	1.000g
SD1 (Equation 16-40 {2/3 X Sm1})	0.520g
Seismic Design Category	D

GEOLOGIC HAZARDS

The subject site is located in an active seismic zone and will likely experience strong seismic shaking during the design life of the proposed project. In general, the intensity of ground shaking will depend on several factors including: the distance to the earthquake focus, the earthquake magnitude, the response characteristics of the underlying materials, and the quality and type of construction. Geologic hazards and their relationship to the site are discussed below.

I. Surface Rupture. Surface rupture is expected to occur along preexisting, known active fault traces. However, surface rupture could potentially splay or step from known active faults or rupture along unidentified traces. Based on review of Jennings (1994), CDOC (2019) and Morton (2003) faults are not mapped on the site. In addition, no signs of active surface faulting were observed during our review of non-stereo digitized photographs of the site and site vicinity (Google, 2019). Finally, no signs of active surface rupture or secondary seismic effects (lateral spreading, lurching etc.) were identified on-site during our field investigation. Therefore, it is our opinion that risks associated with primary surface ground rupture should be considered "low".

II. Ground Shaking. The site has been subjected to past ground shaking by faults that traverse through the region. Strong seismic shaking from nearby active faults is expected to produce strong seismic shaking during the design life of the proposed project. A probabilistic approach was employed to the estimate the peak ground acceleration (a_{max}) that could be experienced at the site. Based on the USGS Unified Hazard Tool (USGS, 2019) and shear wave velocity (Vs30) of 360 m/s, the site could be subjected to ground motions on the order of 0.49g. The peak ground acceleration at the site is judged to have a 475 year return period and a 10 percent chance of exceedance in 50 years.

III. Liquefaction/Seismic Settlement. Liquefaction is the process in which loose, saturated granular soil loses strength as a result of cyclic loading. The strength loss is a result of a decrease in granular sand volume and a positive increase in pore pressures. Generally, liquefaction can occur if all of the following conditions apply: liquefaction-susceptible soil, groundwater within a depth of 50 feet or less, and strong seismic shaking.

According to the County of Riverside, the site is situated within a "Moderate" liquefaction potential zone (RCPR, 2019). Based on the dense nature of the underlying alluvium and the depth to groundwater, risks associated with liquefaction are considered negligible.

IV. Tsunamis and Seiches. Because the site is situated at an elevated inland location and is not immediately adjacent to any impounded bodies of water, risk associated with tsunamis and seiches is considered negligible.

V. Slope Failure, Landsliding, Rock Falls. The site is situated on relatively level ground and is not immediately adjacent to any slopes or hillsides that could be potentially susceptible to slope instability. No signs of slope instability in the form of landslides, rock falls, earthflows or slumps were observed at or near the subject site during our investigation. As such, risks associated with slope instability should be considered "negligible".

VI. Expansive Soil. Expansion Index testing of select samples was performed in order to evaluate the expansive potential of the materials underlying the site. Based the results of our laboratory testing (EI=16), the materials present near the ground surface are considered to have a "very low" expansion potential. Accordingly, risk of structural damage caused by volumetric changes in the subgrade soil is considered "low". However, the surface soil should be tested subsequent to grading and final foundation and slab design should be based upon post-grading expansion test results.

VII. Static Settlement. Static settlement resulting from the anticipated foundation loads should be acceptable provided that the recommendations included in this report are considered in foundation design and construction. The estimated ultimate static settlement is calculated to be approximately 1 inch when using the recommended bearing pressures. As a practical matter, differential static settlement between footings can be assumed as one-half of the total settlement.

VIII. Flooding and Erosion. No signs of flooding or erosion were observed during our field investigation. Risks associated with flooding and erosion should be considered evaluated and mitigated by the project design Civil Engineer.

CONCLUSIONS

Based on the results of our investigation, it is our professional opinion that the project should be feasible from a geotechnical perspective provided that the recommendations provided in this report are incorporated into design and carried out through construction. The main geotechnical concern in the design and construction of the proposed project is the presence of disturbed and potentially compressible near surface soil.

Because of the presence of the somewhat soft and compressible condition of some of the near surface soil, and potential transition related settlements remedial grading including overexcavation and recompaction is recommended for the proposed building and foundation areas. We recommend that remedial grading within the proposed building areas include over-excavation and/or re-compaction of the artificial fill soil and the primary foundation bearing soil. Specific recommendations for site preparation are presented in the Earthwork and Grading section of this report.

Groundwater was not encountered within our bores to the maximum explored depth of 26 feet bgs. Therefore, it is our opinion that groundwater should not be a factor during the construction of the proposed project.

Caving did occur to varying degrees within each of our exploratory bores and the surface soil may be susceptible to caving within deeper excavations. All excavations should be constructed in accordance with the normal CalOSHA excavation criteria. On the basis of our observations of the materials encountered, we anticipate that the subsoil will conform to that described by CalOSHA as Type B or C. Soil conditions should be verified in the field by a "Competent person" employed by the Contractor.

The following recommendations present more detailed design criteria that have been developed on the basis of our field and laboratory investigation.

EARTHWORK AND GRADING

All earthwork including excavation, backfill and preparation of the surface soil, should be performed in accordance with the geotechnical recommendations presented in this report and portions of the local regulatory requirements, as applicable. All earth work should be performed under the observation and testing of a qualified soil engineer. The following geotechnical engineering recommendations for the proposed project are based on observations from the field investigation program, laboratory testing and geotechnical engineering analyses.

a. Stripping. Areas to be graded should be cleared of the scattered weeds and surface vegetation. All areas scheduled to receive fill should be cleared of surface improvements, artificial fill and any unsuitable matter. The unsuitable materials should be removed from the site. Existing artificial fill soil should be removed in its entirety and replaced as engineered fill. Voids left by obstructions should be properly backfilled in accordance with the compaction recommendations of this report.

b. Preparation of Building Areas. In order to achieve firm and uniform bearing conditions, we recommend over-excavation and re-compaction throughout the building areas. All native low density near surface soil and bedrock (if encountered) should be removed to at least 3 feet below existing grade or 3 feet below the bottom of the footings, whichever is deeper. If deeper removals are deemed necessary during site grading, the removals should be equivalent to approximately one-half of the maximum removals to minimize the potential for differential settlements related to variable fill depths. Remedial grading should extend laterally beyond the building perimeters a minimum distance equivalent to the fill depth where possible. The exposed surface soil should then be scarified, moisture conditioned to within two percent of optimum moisture content, and compacted to at least 90 percent relative compaction.

c. Compaction. Soil to be used as engineered fill should be free of organic material, debris, and other deleterious substances, and should not contain irreducible matter greater than three inches in maximum dimension. All fill materials should be placed in thin lifts, not exceeding six inches in a loose condition. If import fill is required, the material should be of a low to non-expansive nature and should meet the following criteria:

Plastic Index	Less than 12
Liquid Limit	Less than 35
Percent Soil Passing #200 Sieve	Between 15% and 35%
Maximum Aggregate Size	3 inches

The subgrade and all fills material should be compacted with acceptable compaction equipment, to at least 90 percent relative compaction. The bottom of the exposed subgrade should be observed by a representative of Sladden Engineering prior to fill placement. Compaction testing should be performed on all lifts in order to ensure proper placement of the fill materials. Table 3 provides a summary of the excavation and compaction recommendations.

TABLE 3
SUMMARY OF RECOMMENDATIONS

*Remedial Grading	Removal and recompaction of all fill soil and loose native soil to depths of at least 3 feet below existing grade or 3 feet below the bottom of footings, whichever is deeper. Removals should extend laterally a minimum of 5 feet beyond the footing limits.
Native / Import Engineered Fill	Place in thin lifts not exceeding 6 inches in the loose state, compact to a minimum of 90 percent relative compaction.
Asphalt Concrete Sections	Compact the top 12 inches to at least 95 percent compaction within 2 percent of optimum moisture content.

*Actual depth may vary and should be determined by a representative of Sladden Engineering in the field during construction.

d. Shrinkage and Subsidence. Volumetric shrinkage of the material that is excavated and replaced as controlled compacted fill should be anticipated. We estimate that this shrinkage could vary from 10 to 15 percent. Subsidence of the surfaces that are scarified and compacted should be between 1 and 2 tenths of a foot. This will vary depending upon the type of equipment used, the moisture content of the soil at the time of grading and the actual degree of compaction attained.

FOUNDATIONS: CONVENTIONAL SHALLOW SPREAD FOOTINGS

Exterior footings should extend at least 18 inches beneath lowest adjacent grade and interior footings should extend at least 12 inches below slab subgrade. Isolated square or rectangular footings at least 2 feet square and continuous footings at least 12 inches wide may be designed using allowable bearing pressures of 2200 and 2000 pounds per square foot, respectively. The allowable bearing pressure may be increased by approximately 250 psf for each additional 1 foot of width and 250 psf for each additional 6 inches of depth, if desired. The maximum allowable bearing pressure should be limited to 4000 psf unless confirmed by Sladden Engineering subsequent to performing specific settlement calculations. The allowable bearing pressures are for dead and frequently applied live loads and may be increased by 1/3 to resist wind, seismic or other transient loading.

The allowable bearing pressure may be increased by one-third when considering transient live loads, including seismic and wind forces. All footings should be reinforced in accordance with the project structural engineer's recommendations.

Based on the allowable bearing pressures recommended above, total settlement of the shallow footings are anticipated to be less than one inch, provided that foundation preparation conforms to the recommendations provided in this report. Differential settlement is anticipated to be approximately one-half the total settlement for similarly loaded footings spaced approximately 50 feet apart.

Resistance to lateral loads may be provided by a combination of friction acting at the base of the slabs or foundations and passive earth pressure along the sides of the foundations. A coefficient of friction of 0.45 between soil and concrete may be used for dead load forces only. A passive earth pressure of 275 pounds per square foot, per foot of depth, may be used for the sides of footings that are placed against properly compacted native soil. Passive earth pressure should be ignored within the upper 1 foot except where confined.

All footing excavations should be observed by a representative of the project geotechnical consultant to verify adequate embedment depths prior to placement of forms, steel reinforcement or concrete. The excavations should be trimmed neat, level and square. All loose, disturbed, sloughed or moisture-softened soils and/or any construction debris should be removed prior to concrete placement. Excavated soil generated from footing and/or utility trenches should not be stockpiled within the building envelope or in areas of exterior concrete flatwork.

DRILLED PIERS

We anticipate that the proposed gas station will include a fuel canopy that will be supported upon cast-in-place concrete, drilled pier foundations. We expect that drilled pier foundations approximately 18 to 36 inches in diameter will be used to support the fuel island canopy. The following structural values are provided to assist in drilled pier design. A minimum drilled pier depth of 8 feet is recommended.

Allowable end bearing soil pressure at 8 feet:
a. Static: DL+LL---------- 4.5 ksf
b. Seismic event: DL+LL+EQ ---------- 6.0 ksf

Allowable passive pressure:
a. Surface to 1 foot ---------- Zero
b. Between 1 foot and 10 feet ---------- 250 psf/ft*
* may be doubled when using "flagpole" design

Allowance for skin friction ---------- 250 psf
(Ignore upper 1 foot)
Angle of internal friction, between 1 foot and 12 feet --------30 degrees

Effective unit weight of the site soil:
a. Surface to 5 feet ----------130 pcf

SLABS-ON-GRADE

In order to provide uniform and adequate support, concrete slabs-on-grade must be placed on properly compacted engineered fill soil as outlined in the previous sections of this report. The slab subgrade should remain near optimum moisture content and should not be permitted to dry prior to concrete placement. Slab subgrade should be firm and unyielding. Disturbed soil should be removed and replaced with engineered fill soil compacted to a minimum of 90 percent relative compaction.

Slab thickness and reinforcement should be determined by the Structural Engineer. Considering the expected uses, we recommend a minimum slab thickness of 5.0 inches with minimum slab reinforcement of #4 bars and 24 inches on-center in each direction. All slab reinforcement should be supported on concrete chairs to ensure that reinforcement is placed at slab mid-height. Final floor slab design and reinforcement should be determined by the Structural Engineer.

Slabs with moisture sensitive surfaces should be underlain with a moisture vapor retarder consisting of a polyvinyl chloride membrane such as 10-mil visqueen, or equivalent. All laps within the membrane should be sealed and at least 2 inches of clean sand should be placed over the membrane to promote uniform curing of the concrete. To reduce the potential for punctures, the membrane should be placed on a pad surface that has been graded smooth without any sharp protrusions. If a smooth surface can not be achieved by grading, consideration should be given to placing a 1-inch thick leveling course of sand across the pad surface prior to placement of the membrane.

PRELIMINARY PAVEMENT DESIGN

Asphalt concrete pavements should be designed in accordance with Topic 608 of the Caltrans Highway Design Manual based on R-Value and Traffic Index. The preliminary testing indicated an R-Value of 24 by exudation pressure and 32 by expansion pressure. Preliminary pavement design sections provided herein are based upon a design R-value of 30. The actual R-Value of subgrade soil should be reevaluated prior to the final pavement design.

RECOMMENDED ASPHALT PAVEMENT SECTION LAYER THICKNESS		
Pavement Material	Recommended Thickness	
	TI=5.0	TI=6.5
Asphalt Concrete Surface Course	3.0 inches	4.0 inches
Class II Aggregate Base Course	6.0 inches	8.0 inches
Compacted Subgrade Soil	12 inches	12 inches

Asphalt concrete should conform to Section 39 of the latest edition of the CalTrans Standard Specifications. Class II aggregate base should conform to Section 26 Caltrans Standard Specifications, latest edition. The aggregate base course should be compacted to at least 95 percent of the maximum dry density as determined by ASTM Method D 1557 or to the dry density revealed by the R-value test data, whichever is greater.

CONCRETE PAVEMENT

We expect that concrete pavement may be used for some on-site pavement areas. A concrete pavement section of 6.0 inches of Portland Cement Concrete (PCC) on 4.0 inches of compacted aggregate base material should be adequate for the on-site concrete pavement subject to light vehicle traffic and occasional heavy truck traffic. In areas where repeated and regular heavy truck traffic is expected, the concrete pavement section should be increased to 8.0 inches of PCC on 4.0 inches of compacted aggregate material.

Properly spaced and constructed control joints including expansion joints and contraction joints should be incorporated into concrete pavement design to accommodate temperature and shrinkage related cracking. Joint spacing and joint patterns should be established based upon Portland Cement Association (PCA) and American Concrete Institute (ACI) guidelines.

CORROSION SERIES

The soluble sulfate concentrations of the surface soil were determined to be 280 parts per million (ppm). The soil is considered to have a "moderate" corrosion potential with respect to concrete. The use of Type V cement and special sulfate resistant concrete mixes may be necessary. Soluble sulfate content of the surface soil should be reevaluated after grading and appropriate concrete mix designs should be established based upon post-grading test results.

The pH level of the surface soil was determined to be 9.1. Based on soluble chloride concentration testing (80 ppm), the soil is considered to have a "low" corrosion potential with respect to normal grade steel. The minimum resistivity of the surface soil was found to be 2800 ohm-cm that suggests the site soil is considered to have a "moderate" corrosion potential with respect to ferrous metal installations. Accordingly, a corrosion expert should be consulted regarding appropriate corrosion protection measures.

UTILITY TRENCH BACKFILL

All utility trench backfill should be compacted to a minimum relative compaction of 90 percent. Trench backfill materials should be placed in lifts no greater than six inches in a loose condition, moisture conditioned (or air-dried) as necessary to achieve near optimum moisture conditions, and mechanically compacted to a minimum relative compaction of 90 percent. A representative of the project geotechnical consultant should test the backfill material to verify adequate compaction.

EXTERIOR CONCRETE FLATWORK

To minimize cracking of concrete flatwork, the subgrade soil below concrete flatwork areas should first be compacted to a minimum relative compaction of 90 percent. A representative of the project geotechnical consultant should observe and verify the density and moisture content of the soil.

DRAINAGE

All final grades should be provided with positive gradients away from foundations to provide rapid removal of surface water runoff to an adequate discharge point. No water should be allowed to be pond on or immediately adjacent to foundation elements. In order to reduce water infiltration into the subgrade soil, surface water should be directed away from building foundations to an adequate discharge point. Subgrade drainage should be evaluated upon completion of the precise grading plans and in the field during grading.

LIMITATIONS

The findings and recommendations presented in this report are based upon an interpolation of the soil conditions between the exploratory boring locations and extrapolation of these conditions throughout the proposed building areas. Should conditions encountered during grading appear different than those indicated in this report, this office should be notified.

The use of this report by other parties or for other projects is not authorized. The recommendations of this report are contingent upon monitoring of the grading operation by a representative of Sladden Engineering. All recommendations are considered to be tentative pending our review of the grading operation and additional testing, if indicated. If others are employed to perform any soil testing, this office should be notified prior to such testing in order to coordinate any required site visits by our representative and to assure indemnification of Sladden Engineering.

We recommend that a pre-job conference be held on the site prior to the initiation of site grading. The purpose of this meeting will be to assure a complete understanding of the recommendations presented in this report as they apply to the actual grading performed.

ADDITIONAL SERVICES

Once completed, final project plans and specifications should be reviewed by use prior to construction to confirm that the full intent of the recommendations presented herein have been applied to design and construction. Following review of plans and specifications, observation should be performed by the Soil Engineer during construction to document that foundation elements are founded on/or penetrate into the recommended soil, and that suitable backfill soil is placed upon competent materials and properly compacted at the recommended moisture content.

Tests and observations should be performed during grading by the Soil Engineer or his representative in order to verify that the grading is being performed in accordance with the project specifications. Field density testing shall be performed in accordance with acceptable ASTM test methods. The minimum acceptable degree of compaction should be 90 percent for subgrade soils and 95 percent for Class II aggregate base as obtained by the ASTM D1557 test method. Where testing indicates insufficient density, additional compactive effort shall be applied until retesting indicates satisfactory compaction.

REFERENCES

Blake, T., 2000, EQFAULT and EQSEARCH, Computer Programs for Deterministic and Probabilistic Prediction of Peak Horizontal Acceleration from Digitized California Faults.

California Building Code (CBC), 2016, California Building Standards Commission.

California Department of Conservation (CDOC), 2019, Regulatory Maps

California Department of Water Resources (CDWR), 2019, Water Data Library. Available at: http://www.water.ca.gov/waterdatalibrary/index.cfm

Cao T., Bryant, W.A., Rowshandel B., Branum D., Wills C.J., (2003), "The Revised 2002 California Probabilistic Seismic Hazard Maps".

GoogleEarth.com, 2019, Vertical Aerial Photographs for the Jurupa Valley area, California, Undated, Variable Scale. Reviewed at googlearth.com

Jennings, Charles W. (Compiler), 1994, Fault Activity Map of California and Adjacent Areas, California Division of Mines and Geology, Geologic Data Map No. 6

Morton, 2003, Geologic Map of the Fontana 7.5' Quadrangle, San Bernardino and Riverside Counties California; Open- File Report 03-418

MM Architect Services Inc, 2019, Site Plan, Site Development, The Shops at Jurupa Valley, NEC Pyrite St. & Mission Blvd, Jurupa Valley, CA 92509; dated September 16, 2019, Sheet A-1.0

Riverside County Parcel Report (RCPR), 2019, available at http://mmc.rivcoit.org/MMC_Public/Custom/disclaimer/Default.htm

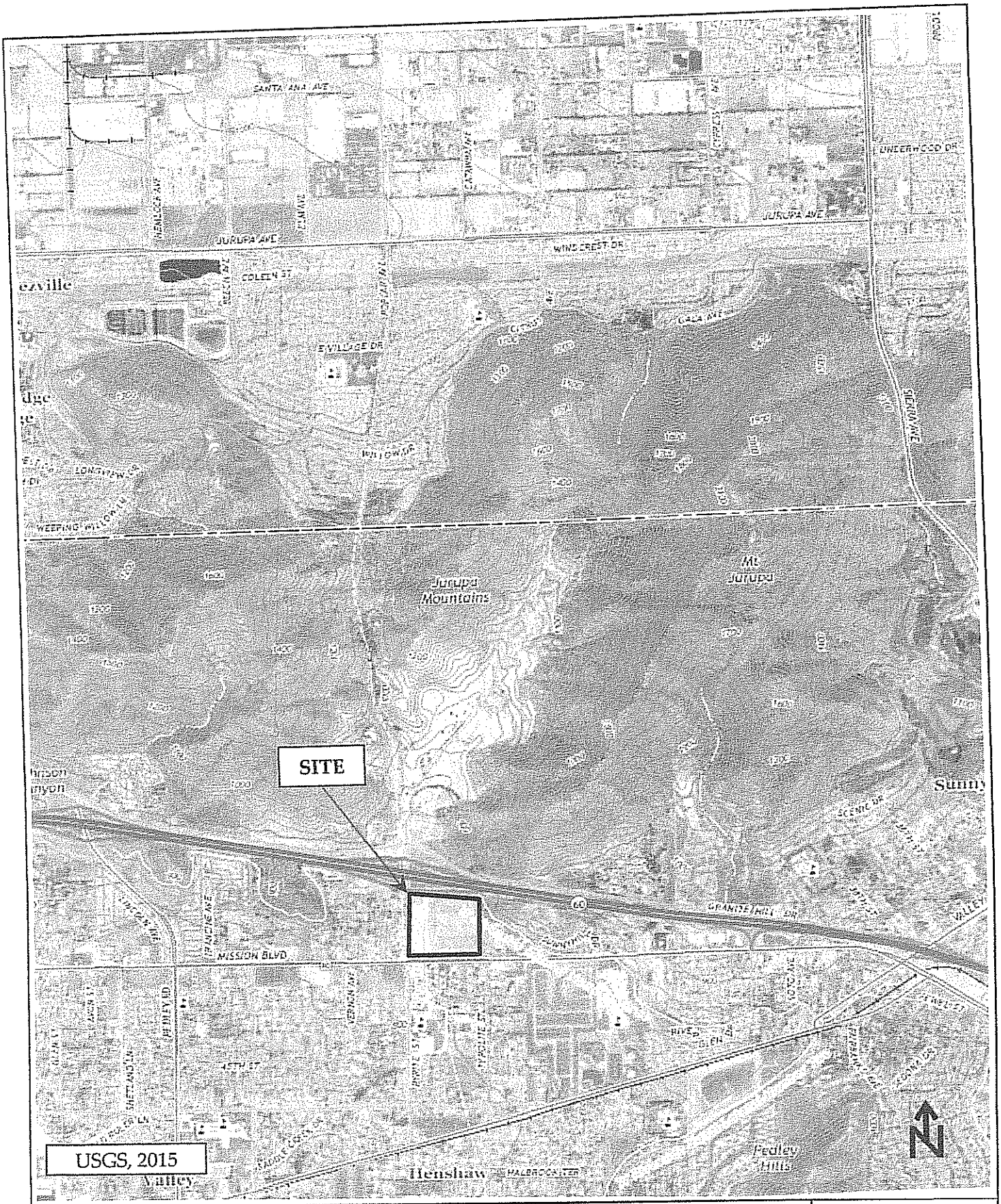
Structural Engineer Association (SEA), 2019, Seismic Design Maps; available at: https://seismicmaps.org/

United States Geological Survey (USGS), 2015, Fontana 7.5 Minute Quadrangle Map, 1:24000.

United States Geological Survey (USGS), 2019, Unified Hazard Tool; available at: https://geohazards.usgs.gov/hazards/interactive/

FIGURES

SITE LOCATION MAP
REGIONAL GEOLOGIC MAP
BOREHOLE LOCATION PHOTOGRAPH
SITE PLAN



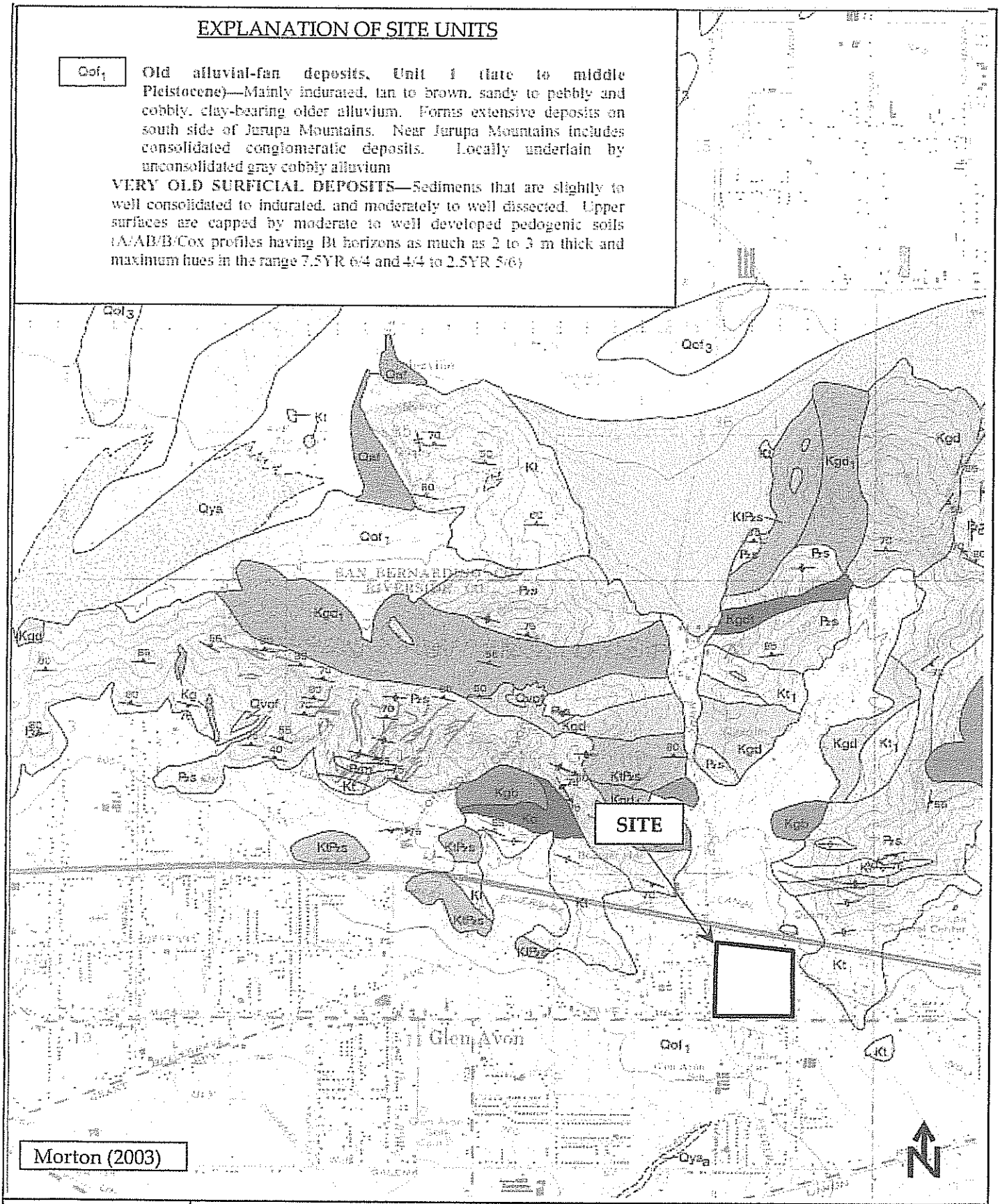
	SITE LOCATION MAP	FIGURE
Sladden Engineering		1

Project Number:	644-19049
Report Number:	19-10-081
Date:	October 28, 2019

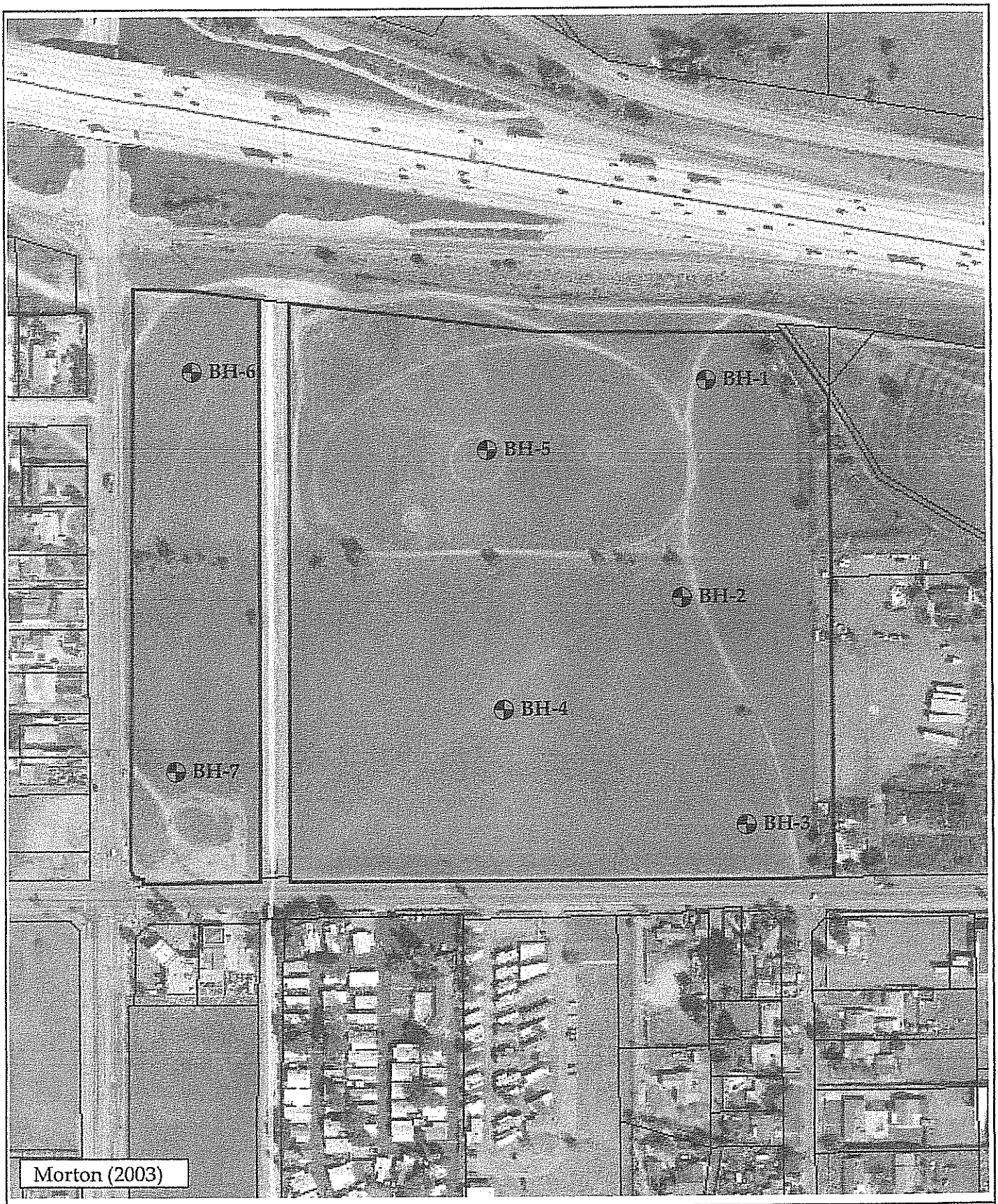
EXPLANATION OF SITE UNITS

Qof_1 **Old alluvial-fan deposits, Unit 1 (late to middle Pleistocene)**—Mainly indurated, tan to brown, sandy to pebbly and cobbly, clay-bearing older alluvium. Forms extensive deposits on south side of Jurupa Mountains. Near Jurupa Mountains includes consolidated conglomeratic deposits. Locally underlain by unconsolidated gray cobbly alluvium

VERY OLD SURFICIAL DEPOSITS—Sediments that are slightly to well consolidated to indurated, and moderately to well dissected. Upper surfaces are capped by moderate to well developed pedogenic soils (A/AB/B/Cox profiles having Bt horizons as much as 2 to 3 m thick and maximum hues in the range 7.5YR 6/4 and 4/4 to 2.5YR 5/6)



Sladden Engineering	REGIONAL GEOLOGIC MAP	FIGURE 2
	Project Number: 644-19049	
	Report Number: 19-10-081	
	Date: October 28, 2019	

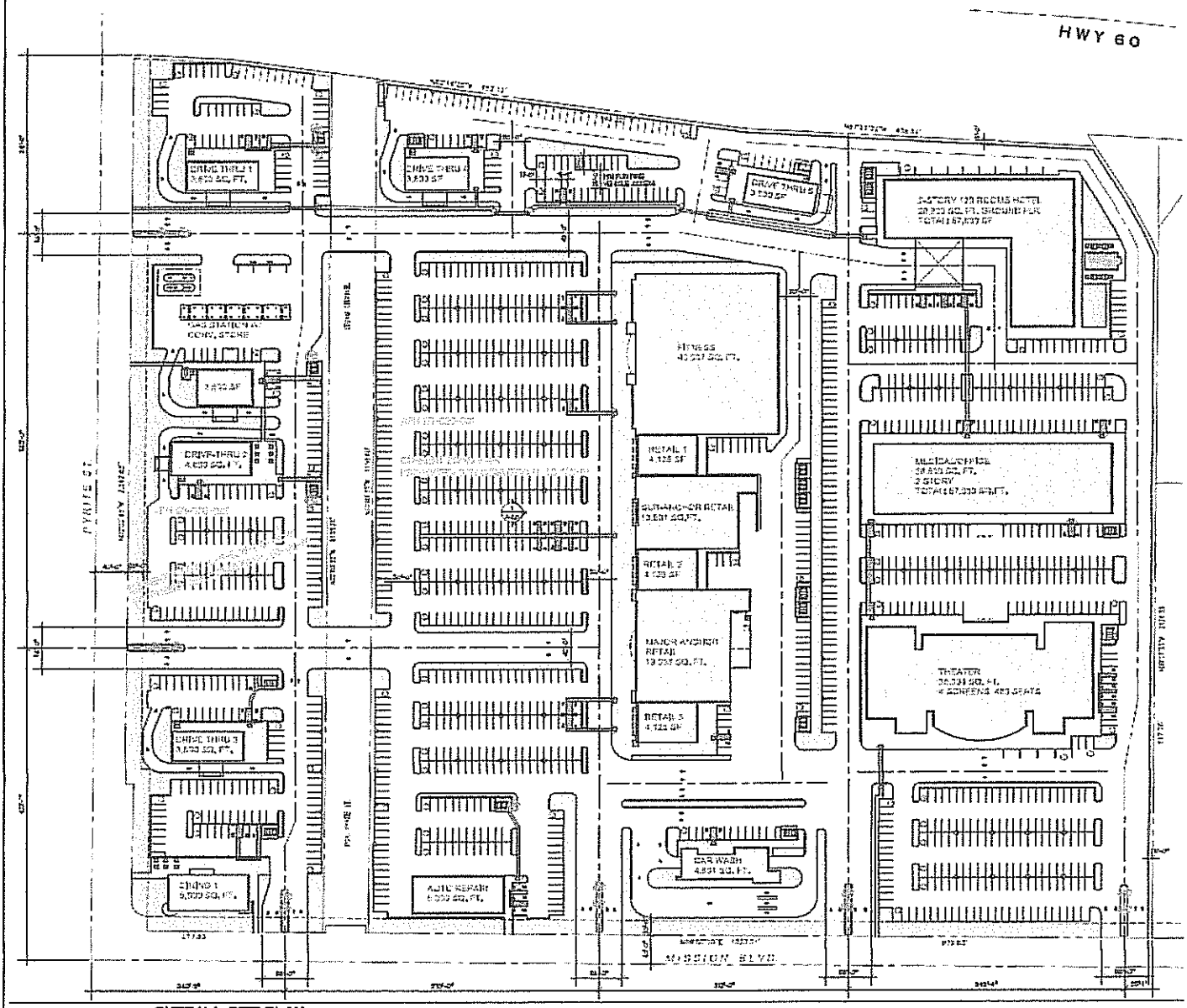


Sladden Engineering

BOREHOLE LOCATION PHOTOGRAPH

FIGURE 3

Project Number:	644-19049
Report Number:	19-10-081
Date:	October 28, 2019



OVERALL SITE PLAN

MM Architect (2019)

Sladden Engineering	SITE PLAN	FIGURE 4
	Project Number: 644-19049	
	Report Number: 19-10-081	
	Date: October 28, 2019	

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

For our field investigation seven (7) exploratory bores were excavated on October 2, 2019 utilizing a truck mounted hollow stem auger rig (Mobile B-61). Continuous logs of the materials encountered were made by a representative of Sladden Engineering. Materials encountered in the boreholes were classified in accordance with the Unified Soil Classification System which is presented in this appendix.

Representative undisturbed samples were obtained within our bores by driving a thin-walled steel penetration sampler (California split spoon sampler) or a Standard Penetration Test (SPT) sampler with a 140 pound automatic-trip hammer dropping approximately 30 inches (ASTM D1586). The number of blows required to drive the samplers 18 inches was recorded in 6-inch increments and blowcounts are indicated on the boring logs.

The California samplers are 3.0 inches in diameter, carrying brass sample rings having inner diameters of 2.5 inches. The standard penetration samplers are 2.0 inches in diameter with an inner diameter of 1.5 inches. Undisturbed samples were removed from the sampler and placed in moisture sealed containers in order to preserve the natural soil moisture content. Bulk samples were obtained from the excavation spoils and samples were then transported to our laboratory for further observations and testing.

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			TYPICAL NAMES	
COARSE GRAINED SOILS: MORE THAN HALF IS LARGER THAN No.200 SIEVE	GRAVELS: MORE THAN HALF COARSE FRACTION IS LARGER THAN No.4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY-GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS: MORE THAN HALF COARSE FRACTION IS SMALLER THAN No.4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS: MORE THAN HALF IS SMALLER THAN No.200 SIEVE	SILTS AND CLAYS: LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS & VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, CLEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS: LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

EXPLANATION OF BORE LOG SYMBOLS


California Split-spoon Sample


Unrecovered Sample


Standard Penetration Test Sample


Groundwater depth

Note: The stratification lines on the borelogs represent the approximate boundaries between the soil types; the transitions may be gradual.

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	10/2/2019
Elevation:	858 Feet (MSL)	Boring No:	BH-1

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Density, pcf	Depth (Feet)	Graphic Lithology	Description
	36/50-5"	1	16	34.0	7.2	126.5	2		Clayey Sand (SC); yellowish brown, slightly moist, very dense, fine- to coarse-grained (Qof).
	25/50-5"			34.1	6.1	140.3	6		Clayey Sand (SC); yellowish brown to olive brown, slightly moist, very dense, fine- to coarse-grained (Qof).
	12/14/14			29.8	6.1		10		Clayey Sand (SC); yellowish brown, slightly moist, medium dense, fine- to coarse-grained (Qof).
	11/13/23			20.6	4.4	119.9	16		Clayey Sand (SC); yellowish brown, slightly moist, medium dense, fine- to coarse-grained (Qof).
	9/10/15			22.5	6.5		20		Clayey Sand (SC); yellowish brown, slightly moist, medium dense, fine- to coarse-grained (Qof).
	50-3"						26		No Recovery.
							28		Terminated at ~26.0 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:

PROPOSED MIXED-USE DEVELOPMENT
NEC PYRITE STREET & MISSION BOULEVARD, JURUPA VALLEY

Project No: 644-19049
Report No: 19-10-081

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	10/2/2019
Elevation:	840 Feet (MSL)	Boring No:	BH-2

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Density, pcf	Depth (Feet)	Graphic Lithology	Description
							0		Clayey Sand (SC); yellowish brown, slightly moist, fine- to coarse-grained (Qof).
	11/12/15			40.4	9.5		5		Clayey Sand (SC); yellowish brown, moist, medium dense, fine- to coarse-grained (Qof).
	20/32/50-6"			31.0	7.1	131.6	10		Clayey Sand (SC); yellowish brown, moist, medium dense, fine- to coarse-grained (Qof).
	12/22/26			19.3	4.7		15		Clayey Sand (SC); yellowish brown, slightly moist, dense, fine- to coarse-grained (Qof).
	21/50-4"			17.4	8.7	109.0	20		Silty Sand (SM); yellowish brown, moist, very dense, fine- to coarse-grained (Qof).
									Terminated at ~21.0 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:

PROPOSED MIXED-USE DEVELOPMENT
NEC PYRITE STREET & MISSION BOULEVARD, JURUPA VALLEY

Project No: 644-19049
Report No: 19-10-081

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	10/2/2019
Elevation:	830 Feet (MSL)	Boring No:	BH-3

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Density, pcf	Depth (Feet)	Graphic Lithology	Description
							0		Clayey Sand (SC); yellowish brown, slightly moist, fine- to coarse-grained (Qof).
	9/15/15			17.4	5.5	122.2	5		Clayey Sand (SC); yellowish brown, slightly moist, medium dense, fine- to coarse-grained (Qof).
	9/11/13			4.2	2.0		10		Gravelly Sand (SP); yellowish brown, dry, medium dense, fine- to coarse-grained (Qof).
	15/26/41			3.2	1.7	110.2	15		Gravelly Sand (SP); yellowish brown, dry, dense, fine- to coarse-grained (Qof).
	16/24/32			30.4	6.5		20		Clayey Sand (SC); yellowish brown to olive brown, slightly moist to moist, very dense, fine- to coarse-grained (Qof).
	50-6"			14.2	7.7	109.3	25		Clayey Sand (SC); yellowish brown, moist, medium dense, fine- to coarse-grained (Qof).
							26		Terminated at ~25.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:

PROPOSED MIXED-USE DEVELOPMENT
NEC PYRITE STREET & MISSION BOULEVARD, JURUPA VALLEY

Project No: 644-19049
Report No: 19-10-081

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	10/2/2019
Elevation:	830 Feet (MSL)	Boring No:	BH-4

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Density, pcf	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); grayish brown, dry, fine- to coarse-grained with gravel (Qof).
	3/4/6			38.6	8.6		6		Clayey Sand (SC); dark yellowish brown, moist, loose, fine- to coarse-grained with gravel (Qof).
	8/16/38			25.6	11.9	117.7	10		Clayey Sand (SC); yellowish brown, moist, dense, fine- to coarse-grained with gravel (Qof).
	15/35/41			11.1	4.1		16		Sand (SP); olive brown, slightly moist, very dense, fine- to coarse-grained (Qof).
	50-5"			23.2	5.6	93.1	20		Clayey Sand (SC); yellowish brown, moist, dense, fine- to coarse-grained with gravel (Qof).
									Terminated at ~20.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:

PROPOSED MIXED-USE DEVELOPMENT
NEC PYRITE STREET & MISSION BOULEVARD, JURUPA VALLEY

Project No: 644-19049
Report No: 19-10-081

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	10/2/2019
Elevation:	845 Feet (MSL)	Boring No:	BH-5

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Density, pcf	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); grayish brown, dry, fine- to coarse-grained with gravel (Qof).
	3/11/21			25.5	7.4	121.2	6		Clayey Sand (SC); yellowish brown, slightly moist, medium dense, fine- to coarse-grained with gravel (Qof).
	8/10/14			21.6	6.0		10		Clayey Sand (SC); yellowish brown, slightly moist, medium dense, fine- to coarse-grained with gravel (Qof).
	9/14/20			12.8	3.5	119.1	16		Clayey Sand (SC); yellowish brown, dry, medium dense, fine- to coarse-grained with gravel (Qof).
	11/14/15			41.3	7.5		20		Clayey Sand (SC); yellowish brown, moist, medium dense, fine- to coarse-grained with gravel (Qof).
	19/39/50-5"			28.6	8.4	130.3	26		Clayey Sand (SC); yellowish brown to olive brown, moist, very dense, fine- to coarse-grained with gravel (Qof).
							28		Terminated at ~26.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:

PROPOSED MIXED-USE DEVELOPMENT
NEC PYRITE STREET & MISSION BOULEVARD, JURUPA VALLEY

Project No: 644-19049
Report No: 19-10-081

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	10/2/2019
Elevation:	845 Feet (MSL)	Boring No:	BH-6

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Density, pcf	Depth (Feet)	Graphic Lithology	Description
							0		Clayey Sand (SC); yellowish brown, dry, fine- to coarse-grained with gravel (Qof).
	8/9/9			36.4	4.7		6		Clayey Sand (SC); yellowish brown, dry to slightly moist, medium dense, fine- to coarse-grained with gravel (Qof).
	8/12/19			12.1	2.6	118.3	10		Silty Sand (SM); yellowish brown, dry, medium dense, fine- to coarse-grained (Qof).
	14/17/22			7.7	2.1		14		Gravelly Sand (SP); yellowish brown, dry, dense, fine- to coarse-grained with cobbles (Qof).
							16		Practical Auger Refusal at ~16.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:

PROPOSED MIXED-USE DEVELOPMENT
NEC PYRITE STREET & MISSION BOULEVARD, JURUPA VALLEY

Project No: 644-19049
Report No: 19-10-081

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	10/2/2019
Elevation:	825 Feet (MSL)	Boring No:	BH-7

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Density, pcf	Depth (Feet)	Graphic Lithology	Description
							2		Clayey Sand (SC); yellowish brown, dry, fine- to coarse-grained with gravel (Qof).
	7/8/9			17.0	5.1	114.3	6		Clayey Sand (SC): yellowish brown, dry to slightly moist, medium dense, fine- to coarse-grained (Qof).
	9/11/13			18.2	4.5		12		Clayey Sand (SC): yellowish brown, dry to slightly moist, medium dense, fine- to coarse-grained (Qof).
	15/29/50-5"			41.5	7.8	130.3	16		Clayey Sand (SC): yellowish brown, moist, very dense, fine- to coarse-grained (Qof).
	22/50-6"			29.1	9.1		20		Clayey Sand (SC): yellowish brown, moist, very dense, fine- to coarse-grained (Qof).
	19/31/50-6"			21.8	6.3	114.4	26		Clayey Sand (SC): yellowish brown, slightly moist, very dense, fine- to coarse-grained (Qof).
							28		Terminated at ~26.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:

PROPOSED MIXED-USE DEVELOPMENT
NEC PYRITE STREET & MISSION BOULEVARD, JURUPA VALLEY

Project No: 644-19049
Report No: 19-10-081

APPENDIX B

LABORATORY TESTING

APPENDIX B

LABORATORY TESTING

Representative bulk and relatively undisturbed soil samples were obtained in the field and returned to our laboratory for additional observations and testing. Laboratory testing was generally performed in two phases. The first phase consisted of testing in order to determine the compaction of the existing natural soil and the general engineering classifications of the soils underlying the site. This testing was performed in order to estimate the engineering characteristics of the soil and to serve as a basis for selecting samples for the second phase of testing. The second phase consisted of soil mechanics testing. This testing including consolidation, shear strength and expansion testing was performed in order to provide a means of developing specific design recommendations based on the mechanical properties of the soil.

CLASSIFICATION AND COMPACTION TESTING

Unit Weight and Moisture Content Determinations: Each undisturbed sample was weighed and measured in order to determine its unit weight. A small portion of each sample was then subjected to testing in order to determine its moisture content. This was used in order to determine the dry density of the soil in its natural condition. The results of this testing are shown on the Bore Logs.

Maximum Density-Optimum Moisture Determinations: Representative soil types were selected for maximum density determinations. This testing was performed in accordance with the ASTM Standard D1557-91, Test Method A. The results of testing are presented graphically in this appendix. The maximum densities are compared to the field densities of the soil in order to determine the existing relative compaction to the soil.

Classification Testing: Soil samples were selected for classification testing. This testing consists of mechanical grain size analyses. This provides information for developing classifications for the soil in accordance with the Unified Soil Classification System which is presented in the preceding appendix. This classification system categorizes the soil into groups having similar engineering characteristics. The results of this testing is very useful in detecting variations in the soils and in selecting samples for further testing.

SOIL MECHANIC'S TESTING

Expansion Testing: One (1) bulk sample was selected for Expansion testing. Expansion testing was performed in accordance with the UBC Standard 18-2. This testing consists of remolding 4-inch diameter by 1-inch thick test specimens to a moisture content and dry density corresponding to approximately 50 percent saturation. The samples are subjected to a surcharge of 144 pounds per square foot and allowed to reach equilibrium. At that point the specimens are inundated with distilled water. The linear expansion is then measured until complete (ASTM D4829).

Direct Shear Testing: One (1) bulk sample was selected for Direct Shear testing. This test measures the shear strength of the soil under various normal pressures and is used to develop parameters for foundation design and lateral design. Tests were performed using a recompacted test specimen that was saturated prior to tests. Tests were performed using a strain controlled test apparatus with normal pressures ranging from 800 to 2300 pounds per square foot (ASTM D3080-04).

Consolidation Testing: Two (2) relatively undisturbed samples were selected for consolidation testing. For this test, a one-inch thick test specimen was subjected to vertical loads varying from 575 psf to 11520 psf applied progressively. The consolidation at each load increment was recorded prior to placement of each subsequent load. The specimens were saturated at 575 psf or 720 psf load increment (ASTM D2435 & D5333).

Corrosion Series Testing: The soluble sulfate concentrations of the surface soil was determined in accordance with California Test Method Number (CA) 417. The pH and Minimum Resistivity were determined in accordance with CA 643. The soluble chloride concentrations were determined in accordance with CA 422.

Sladden Engineering
450 Egan Avenue, Beaumont CA 92223 (951) 845-7743 Fax (951) 845-8863

Maximum Density/Optimum Moisture

ASTM D698/D1557

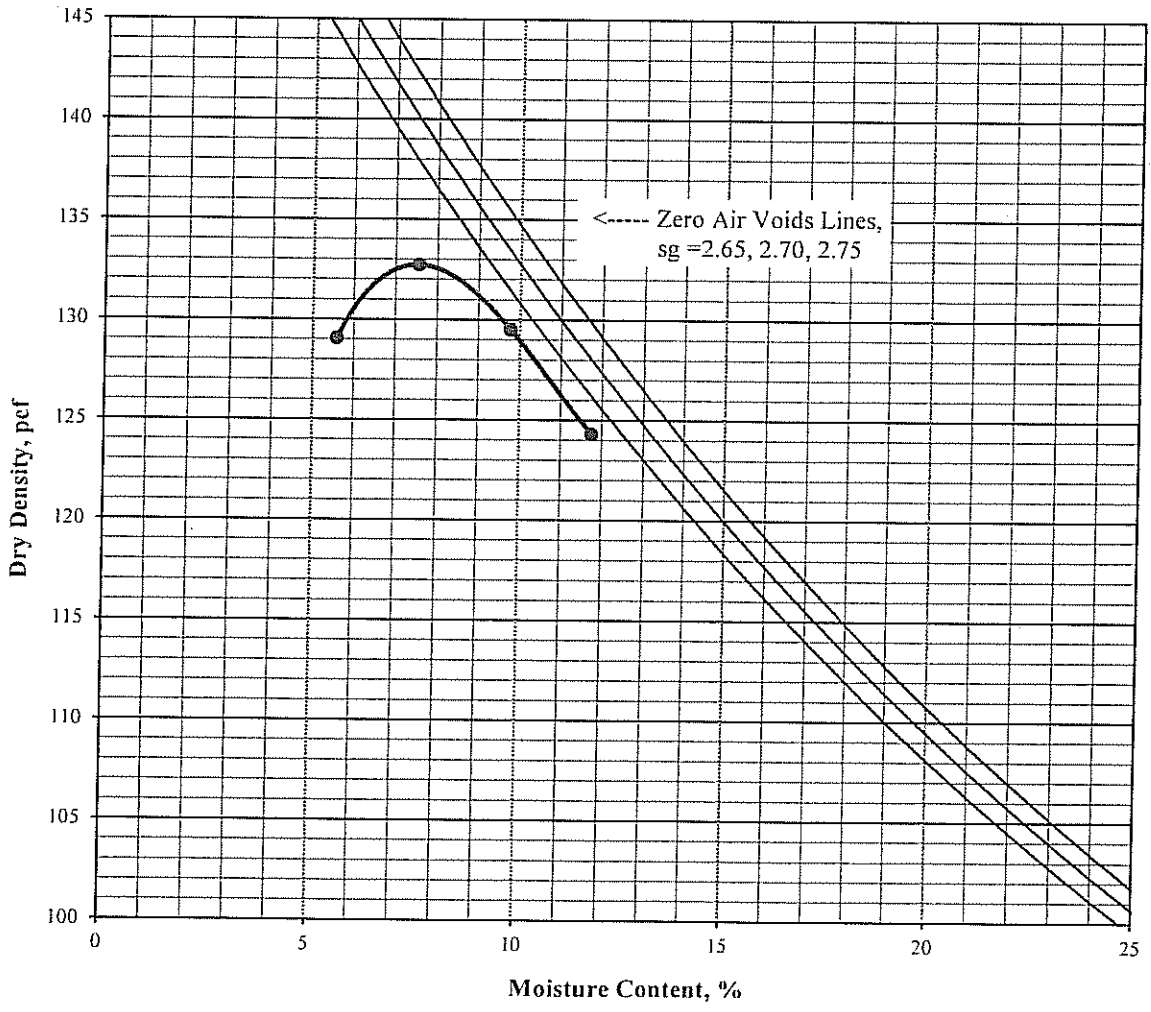
Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample Location: BH-1 Bulk 1 @ 0-5'
Description: Red Brown Clayey Sand (SC)

October 17, 2019

ASTM D-1557 A
Rammer Type: Machine

Maximum Density: 133 pcf
Optimum Moisture: 8%

Sieve Size	% Retained
3/4"	
3/8"	
#4	0.6



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Expansion Index

ASTM D 4829

October 17, 2019

Job Number: 644-19049
Job Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-1 Bulk 1 @ 0-5'
Soil Description: Red Brown Clayey Sand (SC)

Wt of Soil + Ring:	595.0
Weight of Ring:	191.1
Wt of Wet Soil:	403.9
Percent Moisture:	7.7%
Sample Height, in	0.95
Wet Density, pcf:	128.8
Dry Denstiy, pcf:	119.6

% Saturation:	50.9

Expansion **Rack # 3**

Date/Time	10/16/2019	3:00 PM
Initial Reading	0.0000	
Final Reading	0.0155	

Expansion Index **16**

(Final - Initial) x 1000

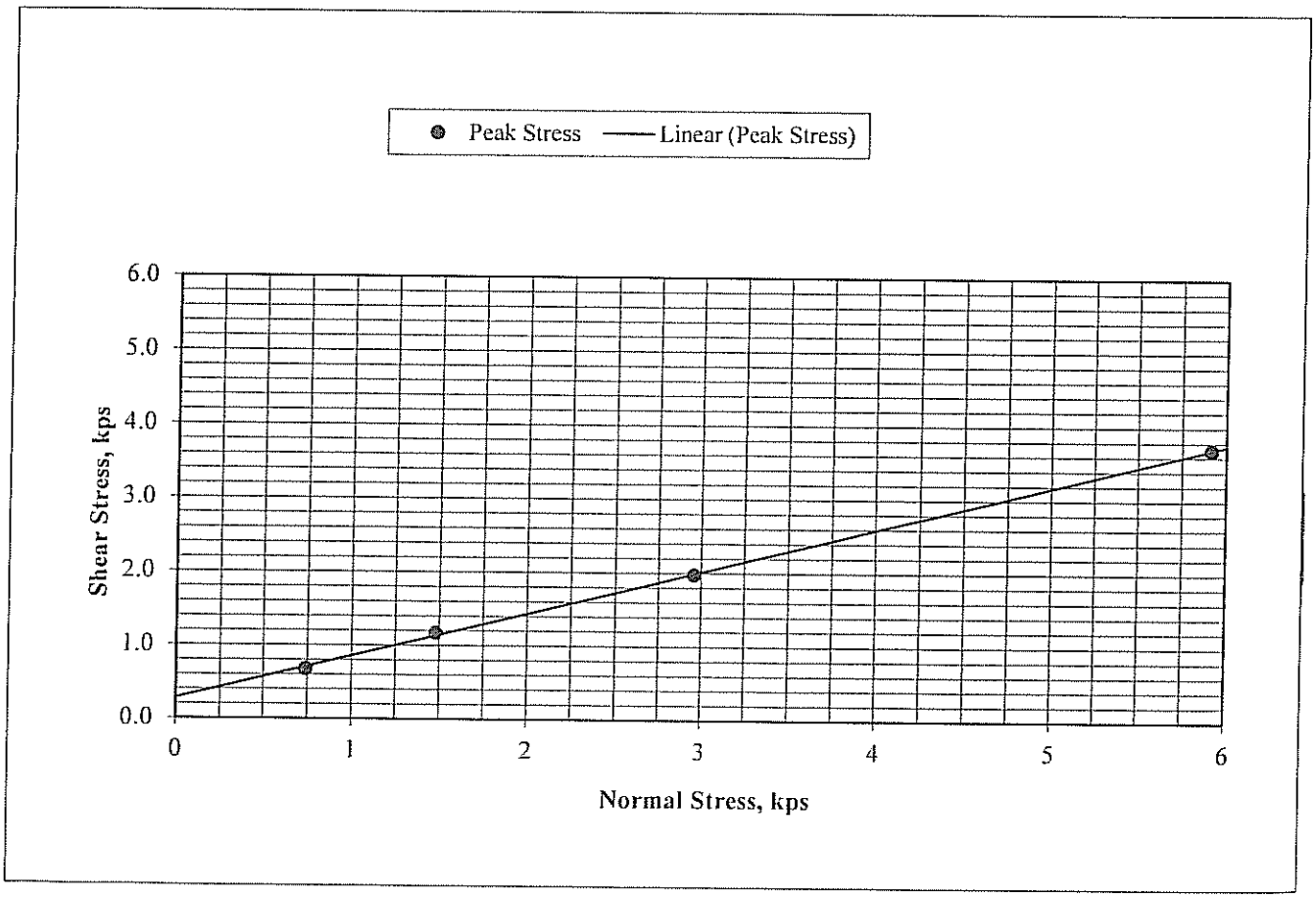
Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Direct Shear ASTM D 3080-04
(modified for unconsolidated condition)

Job Number:	644-19049
Job Name	NEC Pyrite Street & Mission Boulevard
Lab ID No.	LN6-19522
Sample ID	BH-1 Bulk 1 @ 0-5'
Classification	Red Brown Clayey Sand (SC)
Sample Type	Remolded @ 90% of Maximum Density

October 17, 2019
Initial Dry Density: 119.6 pcf
Initial Mosture Content: 8.2 %
Peak Friction Angle (Ø): 30°
Cohesion (c): 280 psf

Test Results	1	2	3	4	Average
Moisture Content, %	14.5	14.5	14.5	14.5	14.5
Saturation, %	95.5	95.5	95.5	95.5	95.5
Normal Stress, kps	0.739	1.479	2.958	5.916	
Peak Stress, kps	0.674	1.175	1.979	3.698	



Job Number: 644-19049
Job Name: NEC Pyrite Street & Mission Boulevard
Date: 10/17/2019

Moisture Adjustment		Remolded Shear Weight	
Wt of Soil:	1,000	Max Dry Density:	133.0
Moist As Is:	5.5	Optimum Moisture:	8.0
Moist Wanted:	8.0		
ml of Water to Add:	23.7	Wt Soil per Ring, g:	155.5

UBC

Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Gradation

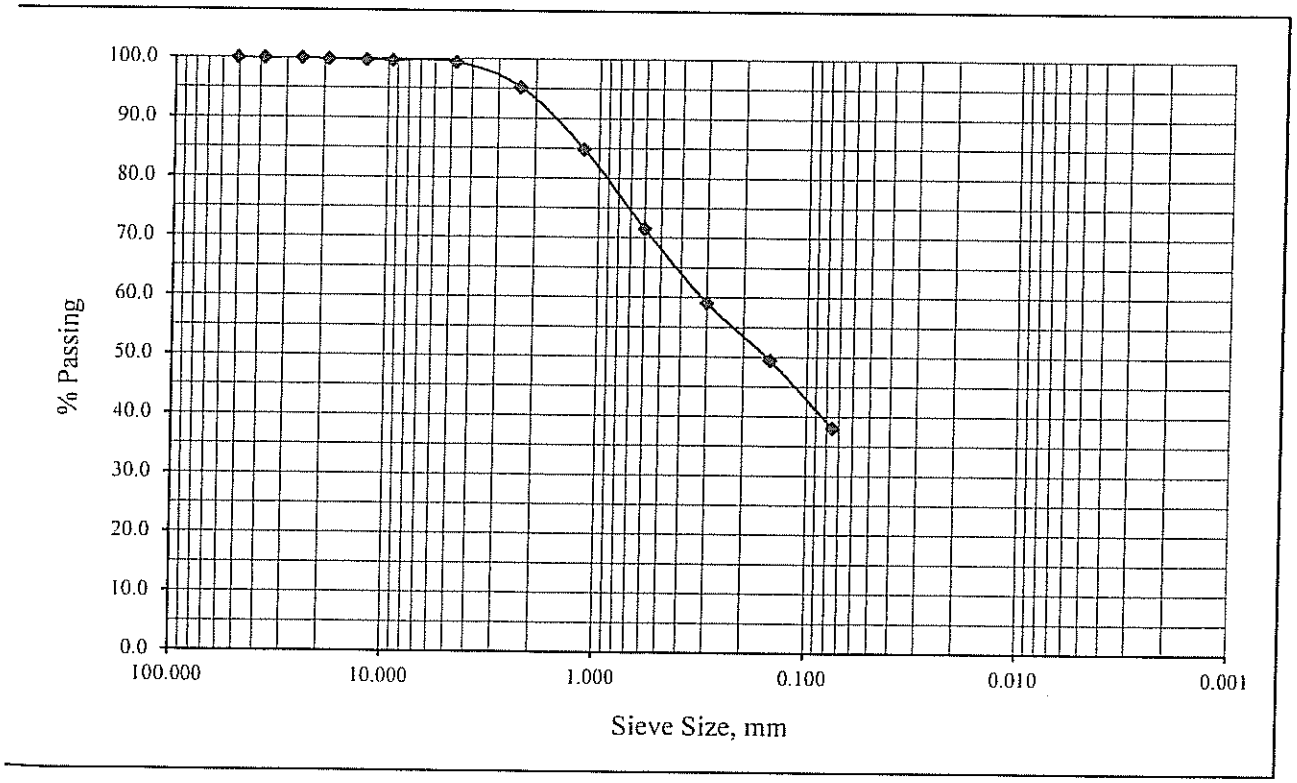
ASTM C117 & C136

Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-1 Bulk 1 @ 0-5'

October 17, 2019

Soil Classification: SC

Sieve Size, in	Sieve Size, mm	Percent Passing
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	99.8
1/2"	12.7	99.7
3/8"	9.53	99.7
#4	4.75	99.4
#8	2.36	95.3
#16	1.18	84.8
#30	0.60	71.5
#50	0.30	59.1
#100	0.15	49.5
#200	0.075	38.1



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Gradation

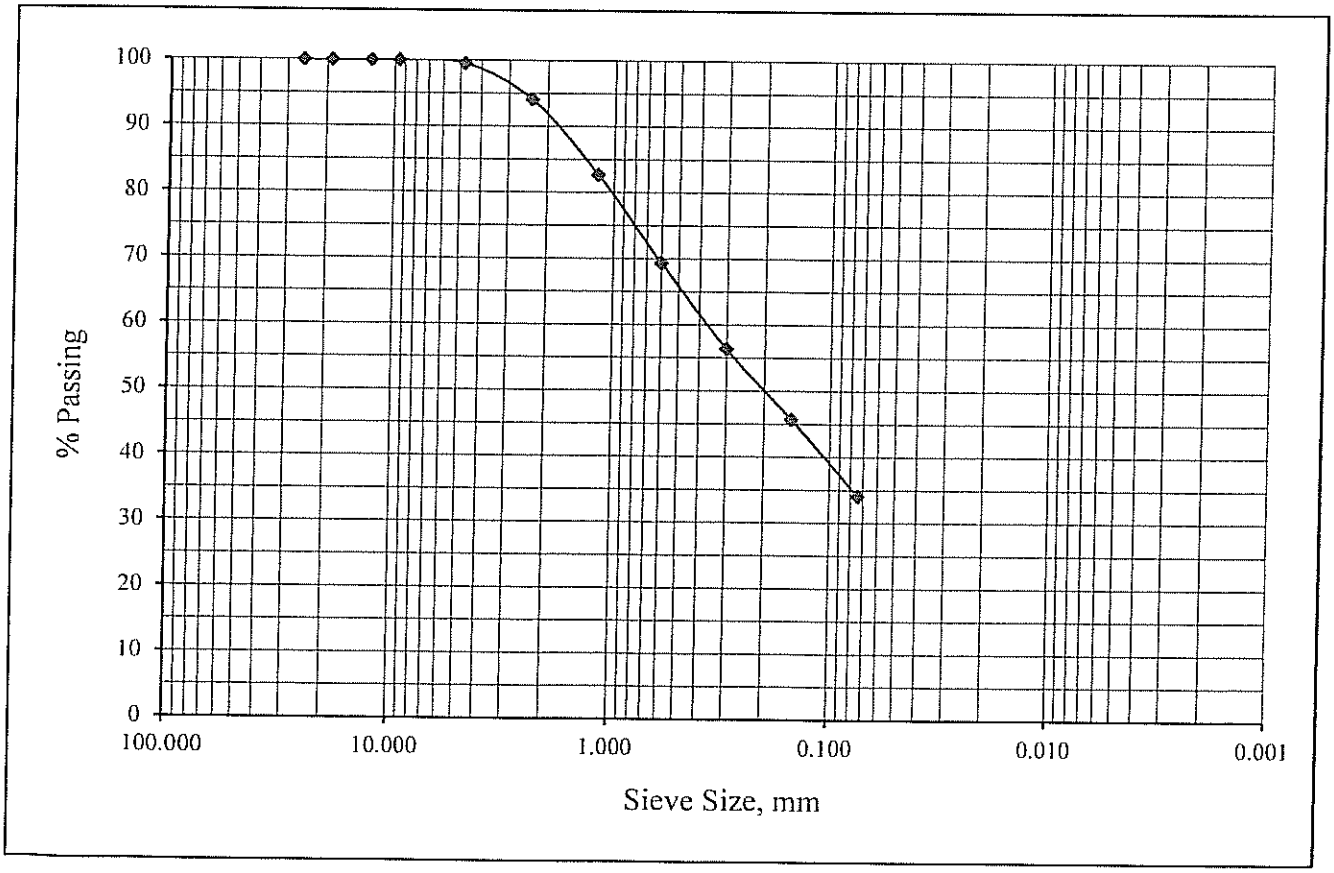
ASTM C117 & C136

Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-1 R-2 @ 5'

October 17, 2019

Soil Classification: SC

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.53	100.0
#4	4.75	99.5
#8	2.36	94.1
#16	1.18	82.7
#30	0.60	69.3
#50	0.30	56.4
#100	0.15	45.7
#200	0.074	34.1



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Gradation

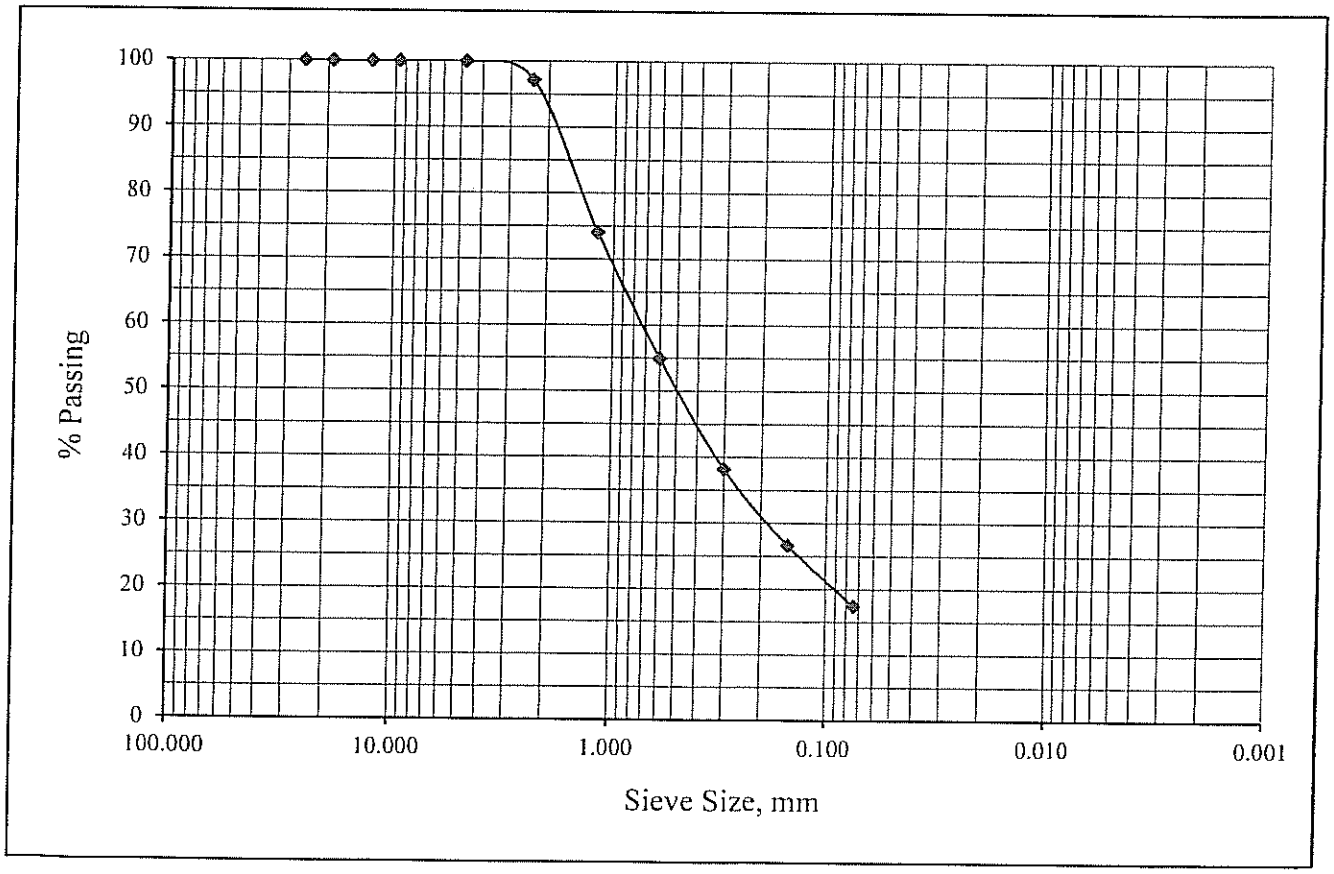
ASTM C117 & C136

Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-2 R-4 @ 20'

October 17, 2019

Soil Classification: SM

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.53	100.0
#4	4.75	100.0
#8	2.36	97.2
#16	1.18	74.1
#30	0.60	54.9
#50	0.30	38.2
#100	0.15	26.6
#200	0.074	17.4



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Gradation

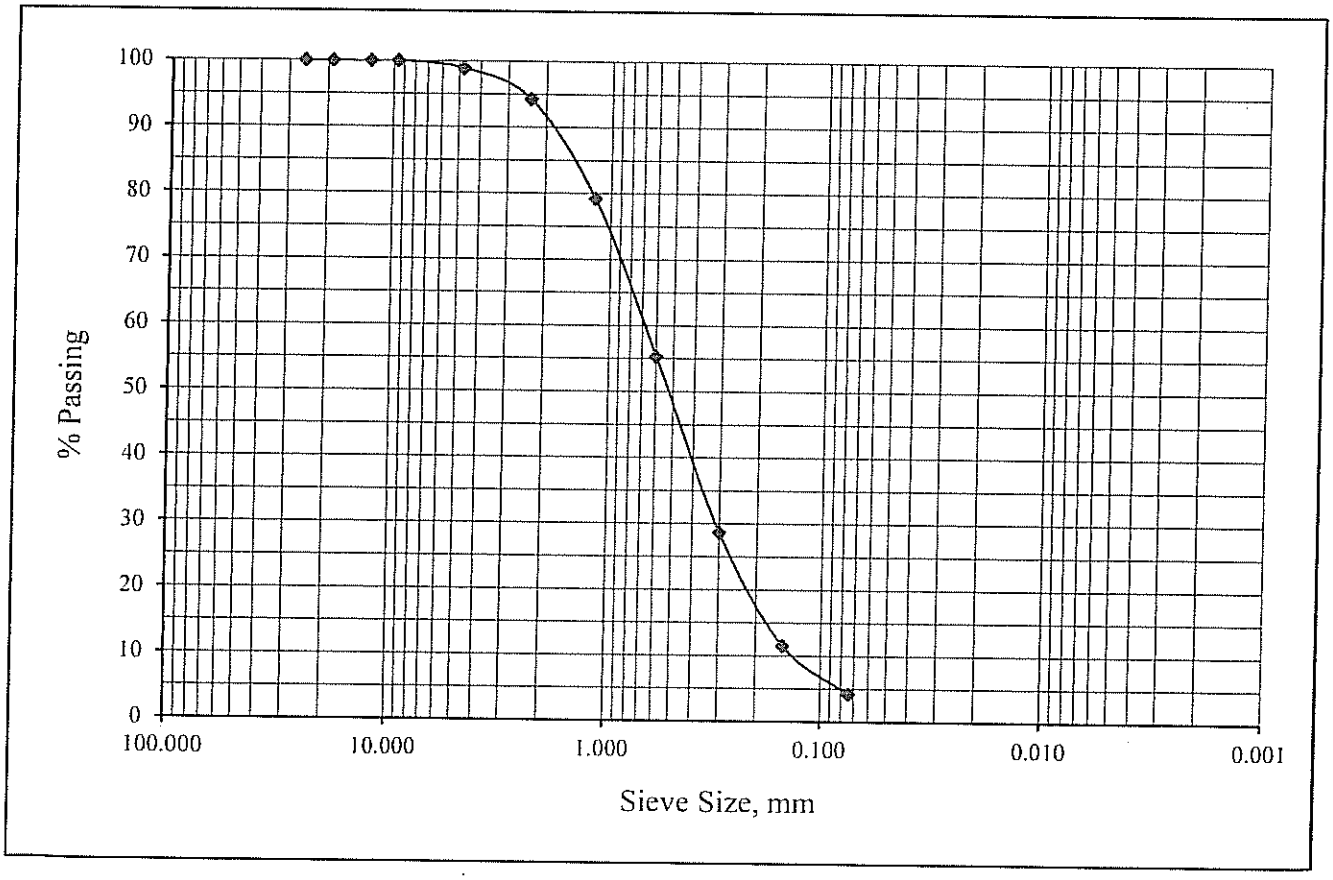
ASTM C117 & C136

Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-3 S-2 @ 10'

October 17, 2019

Soil Classification: SP

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.53	100.0
#4	4.75	98.9
#8	2.36	94.3
#16	1.18	79.2
#30	0.60	55.3
#50	0.30	28.7
#100	0.15	11.5
#200	0.074	4.2



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Gradation

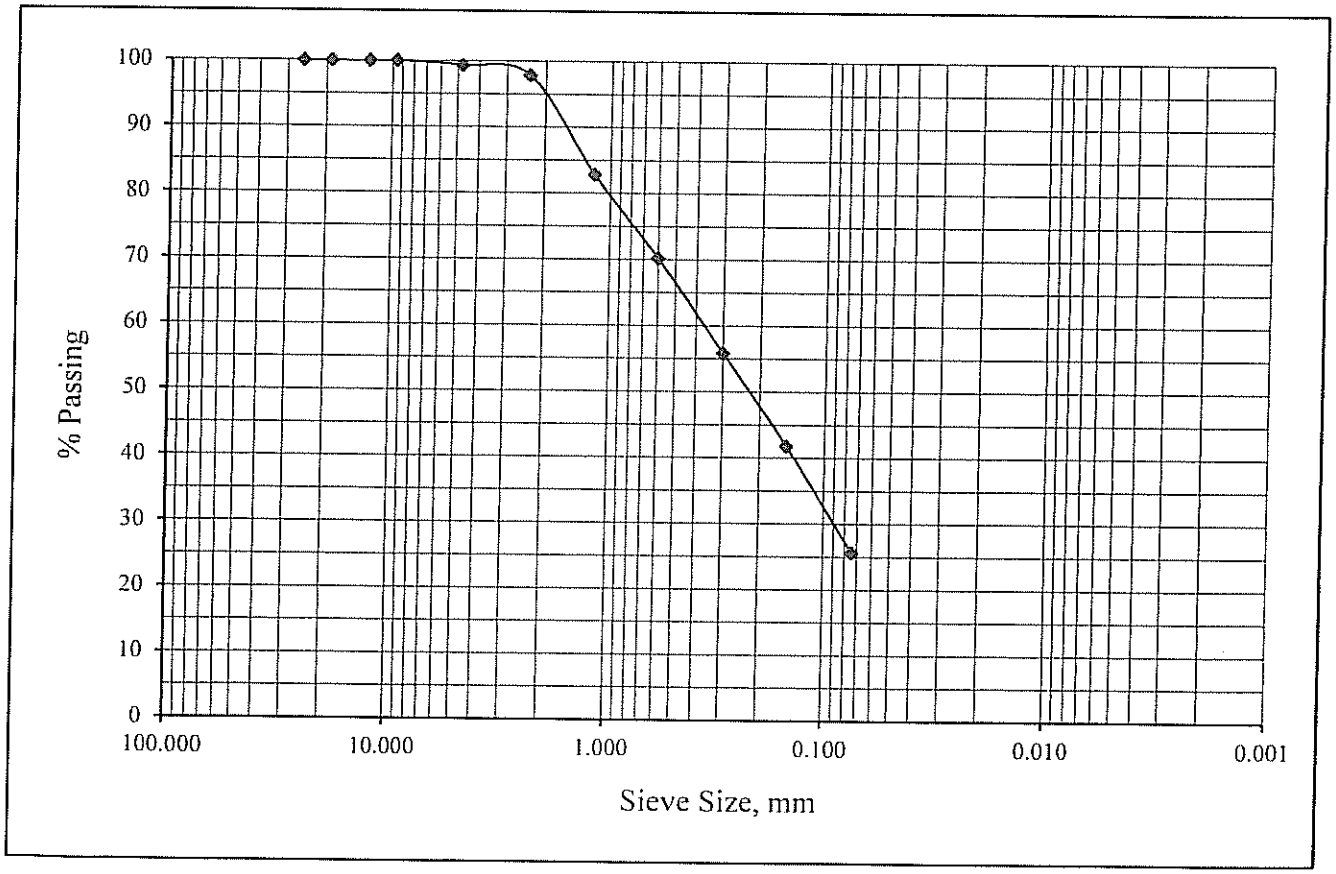
ASTM C117 & C136

Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-4 R-2 @ 10'

October 17, 2019

Soil Classification: SC

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.53	100.0
#4	4.75	99.3
#8	2.36	97.9
#16	1.18	82.8
#30	0.60	70.2
#50	0.30	55.8
#100	0.15	41.8
#200	0.074	25.6



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Gradation

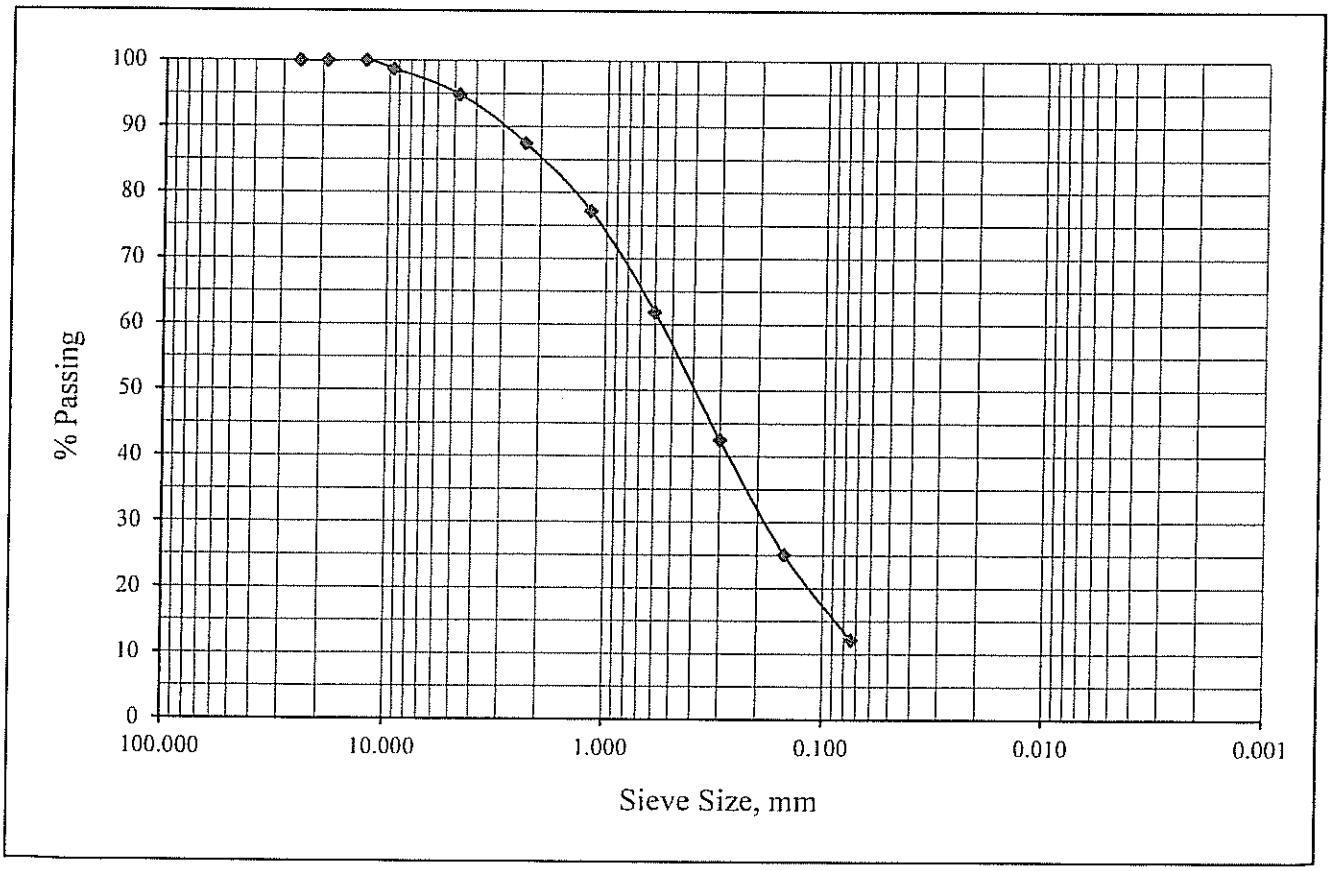
ASTM C117 & C136

Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-6 R-2 @ 10'

October 17, 2019

Soil Classification: SM

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.53	98.7
#4	4.75	94.8
#8	2.36	87.5
#16	1.18	77.2
#30	0.60	61.9
#50	0.30	42.5
#100	0.15	25.1
#200	0.074	12.1



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Gradation

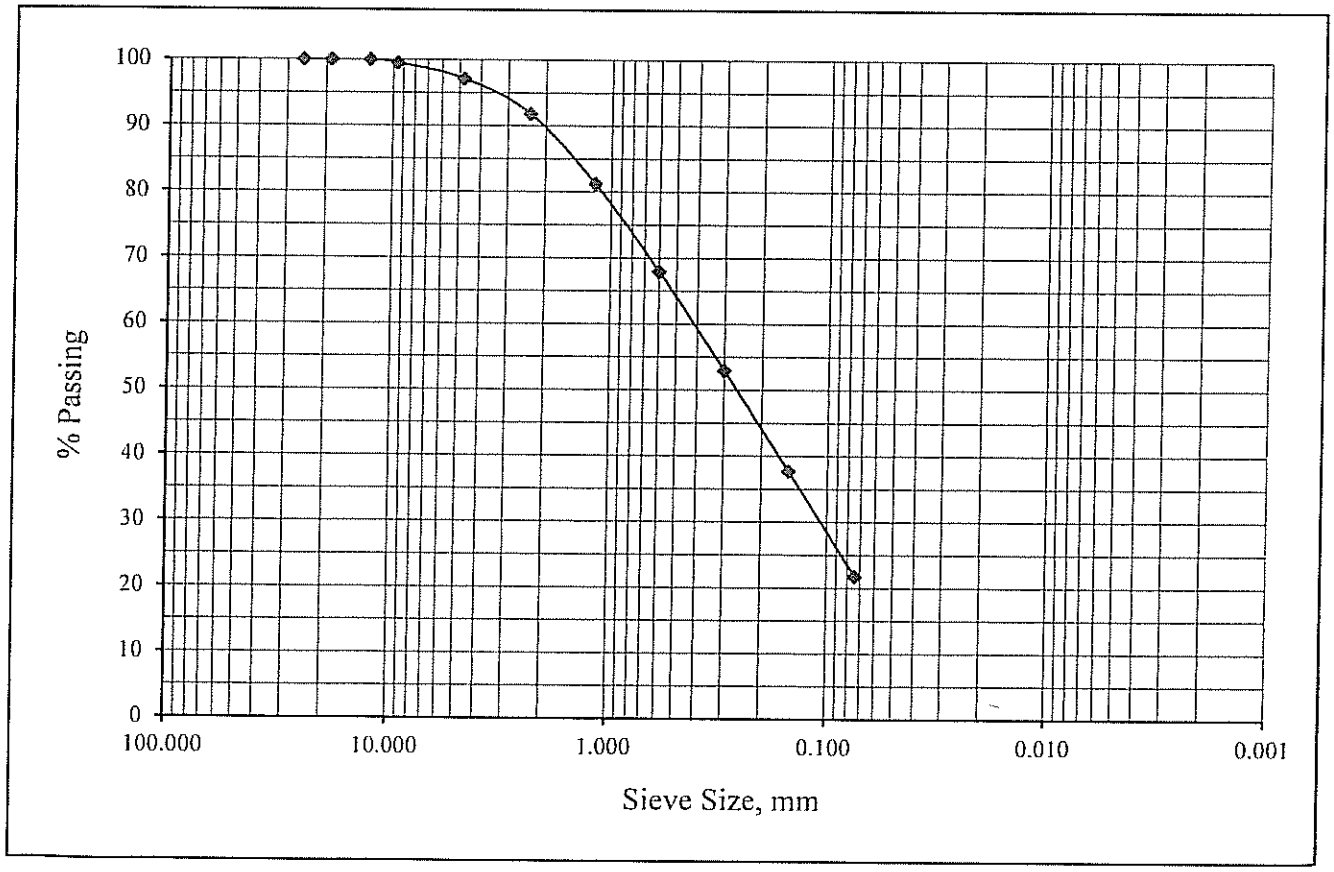
ASTM C117 & C136

Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-7 R-5 @ 25'

October 17, 2019

Soil Classification: SC

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.53	99.5
#4	4.75	97.1
#8	2.36	91.8
#16	1.18	81.2
#30	0.60	67.9
#50	0.30	53.0
#100	0.15	37.7
#200	0.074	21.8



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

One Dimensional Consolidation

ASTM D2435 & D5333

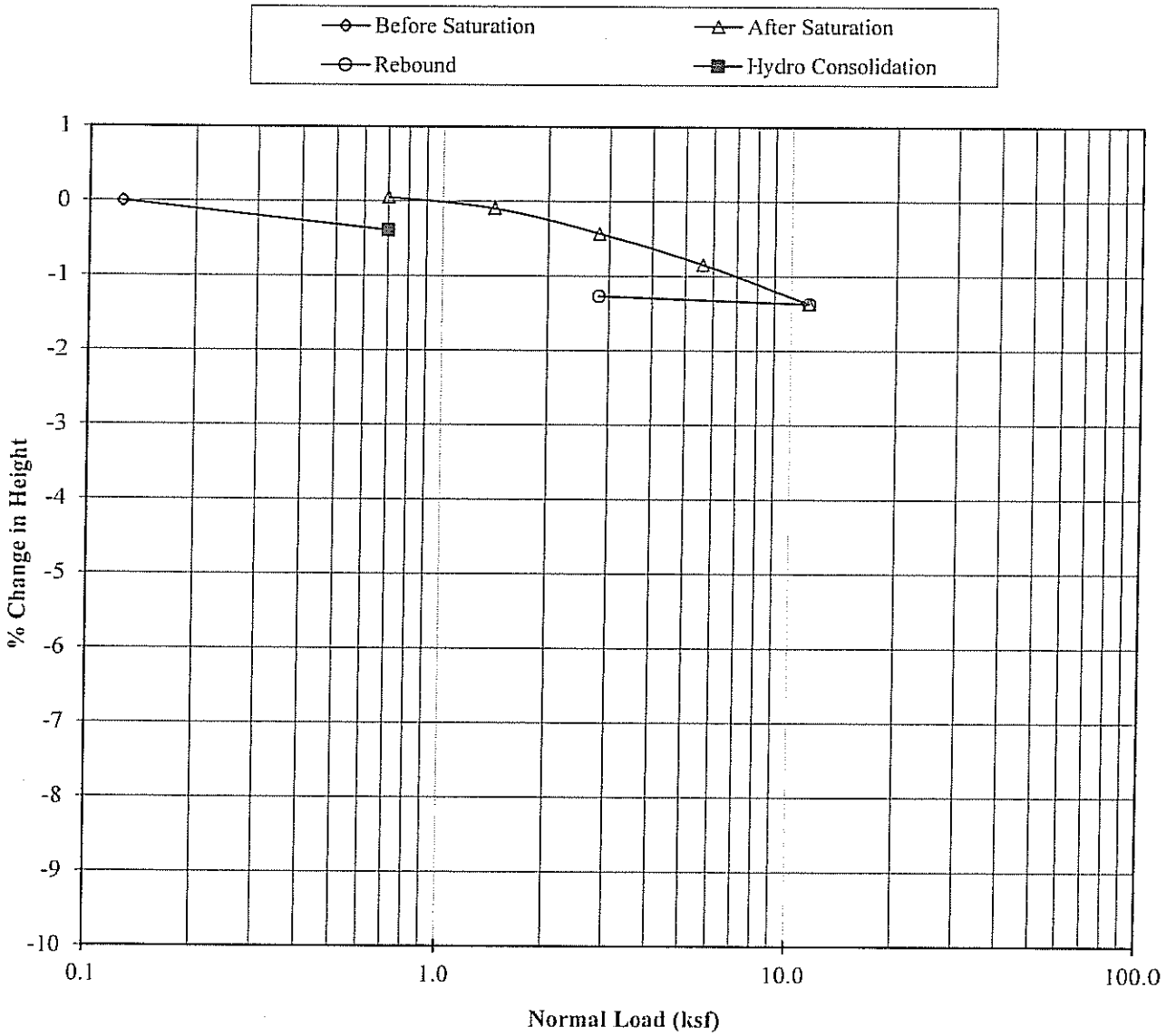
Job Number: 644-19049
Job Name: NEC Pyrite Street & Mission Boulevard

October 17, 2019

Lab ID Number: LN6-19522
Sample ID: BH-1 R-2 @ 5'
Soil Description: Red Brown Clayey Sand (SC)

Initial Dry Density, pcf:	136.7
Initial Moisture, %:	6.1
Initial Void Ratio:	0.219
Specific Gravity:	2.67

% Change in Height vs Normal Presssure Diagram



Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

One Dimensional Consolidation

ASTM D2435 & D5333

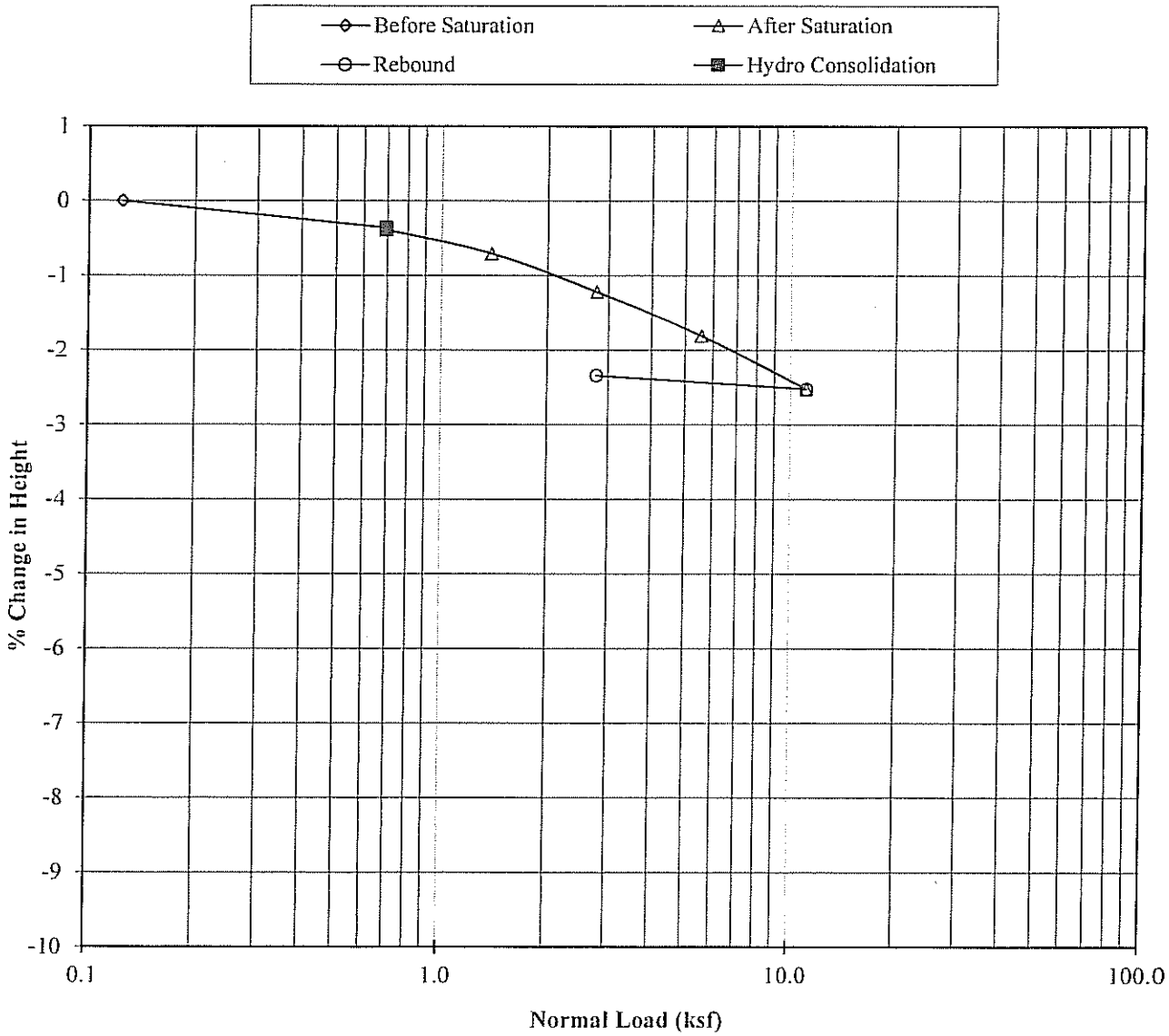
Job Number: 644-19049
Job Name: NEC Pyrite Street & Mission Boulevard

October 17, 2019

Lab ID Number: LN6-19522
Sample ID: BH-4 R-2 @ 10'
Soil Description: Red Brown Clayey Sand (SC)

Initial Dry Density, pcf:	113.0
Initial Moisture, %:	11.9
Initial Void Ratio:	0.476
Specific Gravity:	2.67

% Change in Height vs Normal Presssure Diagram



Sladden Engineering

450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

RESISTANCE '*R*' VALUE AND EXPANSION PRESSURE

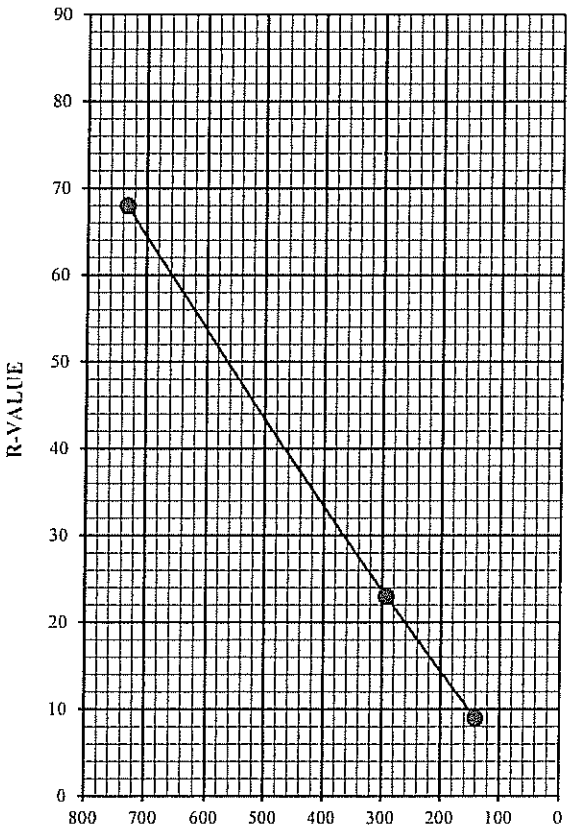
CTM 301

October 17, 2019

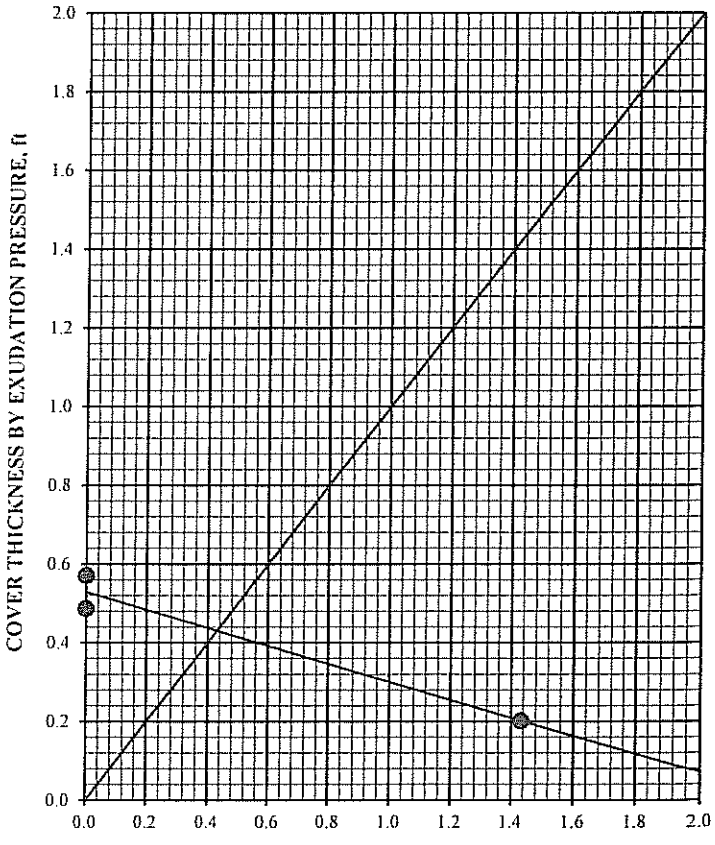
Project Number: 644-19049
Project Name: NEC Pyrite Street & Mission Boulevard
Lab ID Number: LN6-19522
Sample ID: BH-1 Bulk 1 @ 0-5'
Sample Description: Red Brown Clayey Sand (SC)
Specified Traffic Index: 5.0

Dry Density @ 300 psi Exudation Pressure: 124.2-pcf
%Moisture @ 300 psi Exudation Pressure: 11.3%
R-Value - Exudation Pressure: 24
R-Value - Expansion Pressure: 32
R-Value @ Equilibrium: 24

EXUDATION PRESSURE CHART



EXPANSION PRESSURE CHART



Sladden Engineering

6782 Stanton Ave., Suite A, Buena Park, CA 90621 (714) 523-0952 Fax (714) 523-1369
45090 Golf Center Pkwy, Suite F, Indio CA 92201 (760) 863-0713 Fax (760) 863-0847
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Date: October 17, 2019

Account No.: 644-19049

Customer: Panorama Development

Location: APN 171-020-001 & 025, NEC Pyrite Street & Mission Boulevard, Jurupa Valley

Analytical Report

Corrosion Series

	pH per CA 643	Soluble Sulfates per CA 417 ppm	Soluble Chloride per CA 422 ppm	Min. Resistivity per CA 643 ohm-cm
BH-1 @ 0-5'	9.1	280	80	2800

APPENDIX C

SEISMIC DESIGN MAP AND REPORT
DEAGGREGATION OUTPUT

OSHPD

Pyrite Street and Mission Boulevard

Latitude, Longitude: 34.013399, -117.460092

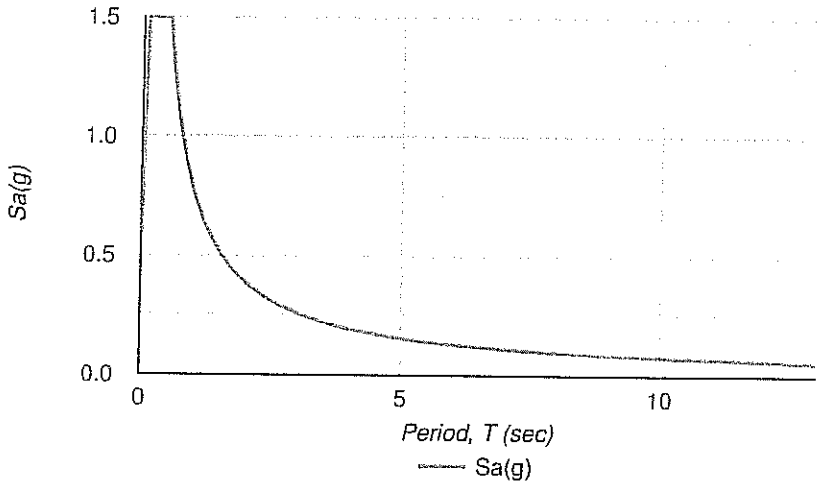
Date	10/7/2019, 12:52:34 PM
Design Code Reference Document	ASCE7-10
Risk Category	II
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	1.5	MCE_R ground motion. (for 0.2 second period)
S_1	0.6	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.5	Site-modified spectral acceleration value
S_{M1}	0.78	Site-modified spectral acceleration value
S_{DS}	1	Numeric seismic design value at 0.2 second SA
S_{D1}	0.52	Numeric seismic design value at 1.0 second SA

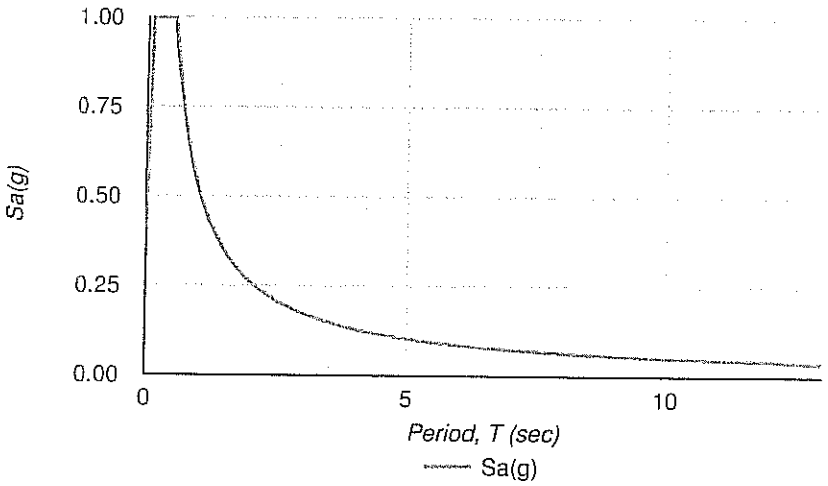
Type	Value	Description
SDC	D	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	1.3	Site amplification factor at 1.0 second
PGA	0.5	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.5	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
SsRT	1.931	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.727	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.74	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.686	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	1.118	Mapped value of the risk coefficient at short periods

Type	Value	Description
C_{R1}	1.079	Mapped value of the risk coefficient at a period of 1 s

MCER Response Spectrum



Design Response Spectrum



DISCLAIMER

While the information presented on this website is believed to be correct, SEAOC /OSHPD and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in this web application should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. SEAOC / OSHPD do not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the seismic data provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the search results of this webstie.

U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

^ Input

Edition

Dynamic: Conterminous U.S. 2014 ...

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.013399

Time Horizon

Return period in years

475

Longitude

Decimal degrees, negative values for western longitudes

-117.460092

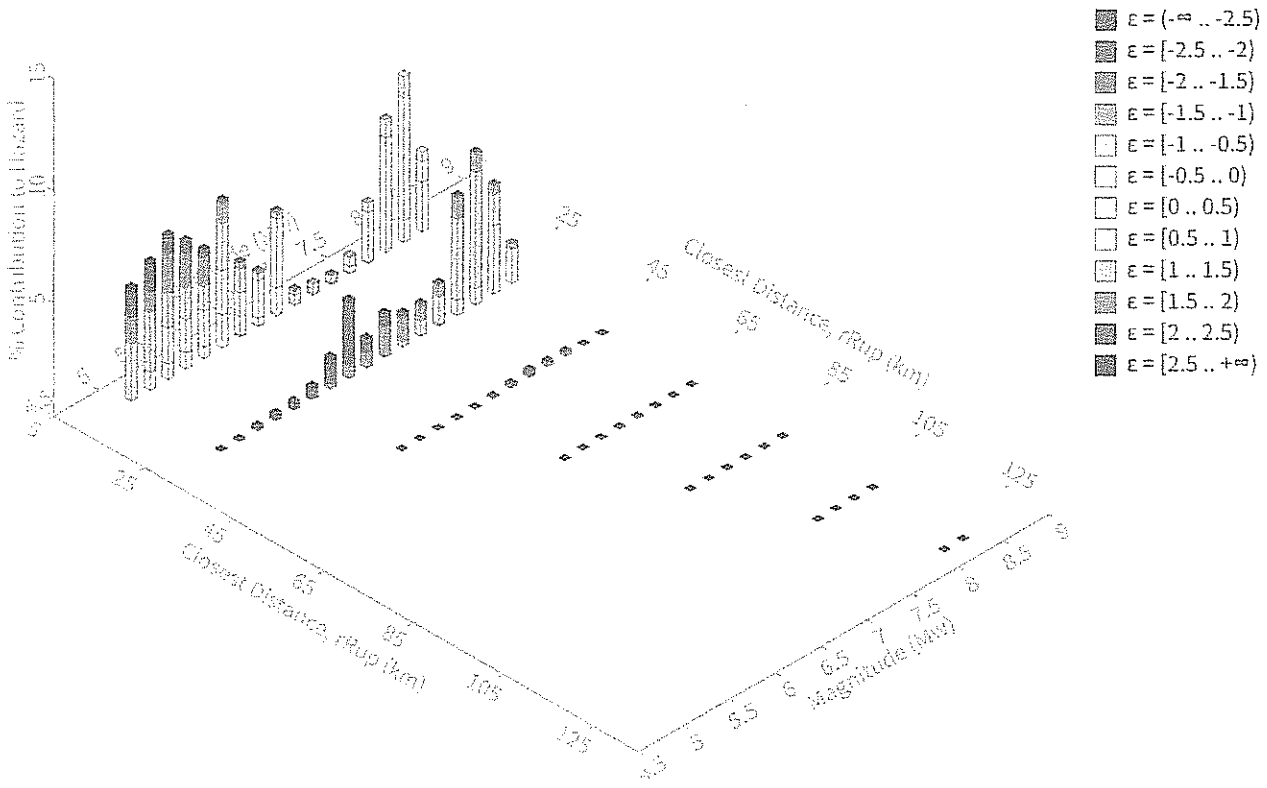
Site Class

360 m/s (C/D boundary)

^ Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 475 yrs
Exceedance rate: 0.0021052632 yr^{-1}
PGA ground motion: 0.48951827 g

Recovered targets

Return period: 515.33559 yrs
Exceedance rate: 0.0019404831 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.13 %

Mean (over all sources)

m: 6.82
r: 16.31 km
ε_0: 1.18 σ

Mode (largest m-r bin)

m: 8.1
r: 15.81 km
ε_0: 0.65 σ
Contribution: 7.39 %

Mode (largest m-r-ε_0 bin)

m: 8.1
r: 15.82 km
ε_0: 0.59 σ
Contribution: 5.5 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							29.20
San Andreas (San Bernardino N) [4]		24.16	7.83	1.20	117.323°W	34.199°N	31.36	7.73
San Jacinto (San Bernardino) [3]		15.87	8.03	0.69	117.322°W	34.099°N	53.16	7.44
Fontana (Seismicity) [1]		6.91	6.59	0.57	117.514°W	34.054°N	312.53	2.61
San Jacinto (Lytle Creek connector) [2]		15.53	8.00	0.67	117.357°W	34.123°N	37.76	1.93
Whittier alt 1 [0]		22.35	7.51	1.21	117.588°W	33.833°N	210.46	1.48
Elsinore (Glen Ivy) rev [0]		23.69	6.55	2.10	117.563°W	33.819°N	203.64	1.48
UC33brAvg_FM32	System							28.64
San Andreas (San Bernardino N) [4]		24.16	7.84	1.20	117.323°W	34.199°N	31.36	7.82
San Jacinto (San Bernardino) [3]		15.87	8.03	0.69	117.322°W	34.099°N	53.16	7.38
Fontana (Seismicity) [1]		6.91	6.59	0.57	117.514°W	34.054°N	312.53	2.16
San Jacinto (Lytle Creek connector) [2]		15.53	7.99	0.68	117.357°W	34.123°N	37.76	1.94
Whittier alt 2 [0]		22.96	7.59	1.19	117.588°W	33.832°N	210.44	1.50
Elsinore (Glen Ivy) rev [0]		23.69	6.54	2.11	117.563°W	33.819°N	203.64	1.50
UC33brAvg_FM31 (opt)	Grid							21.14
PointSourceFinite: -117.460, 34.063		7.36	5.69	0.95	117.460°W	34.063°N	0.00	2.89
PointSourceFinite: -117.460, 34.063		7.36	5.69	0.95	117.460°W	34.063°N	0.00	2.89
PointSourceFinite: -117.460, 34.045		6.26	5.59	0.82	117.460°W	34.045°N	0.00	2.57
PointSourceFinite: -117.460, 34.045		6.26	5.59	0.82	117.460°W	34.045°N	0.00	2.57
PointSourceFinite: -117.460, 34.117		12.03	5.72	1.58	117.460°W	34.117°N	0.00	1.02
PointSourceFinite: -117.460, 34.117		12.03	5.72	1.58	117.460°W	34.117°N	0.00	1.02
UC33brAvg_FM32 (opt)	Grid							21.02
PointSourceFinite: -117.460, 34.063		7.36	5.69	0.95	117.460°W	34.063°N	0.00	2.89
PointSourceFinite: -117.460, 34.063		7.36	5.69	0.95	117.460°W	34.063°N	0.00	2.89
PointSourceFinite: -117.460, 34.045		6.26	5.59	0.82	117.460°W	34.045°N	0.00	2.57
PointSourceFinite: -117.460, 34.045		6.26	5.59	0.82	117.460°W	34.045°N	0.00	2.57
PointSourceFinite: -117.460, 34.117		12.03	5.72	1.58	117.460°W	34.117°N	0.00	1.02
PointSourceFinite: -117.460, 34.117		12.03	5.72	1.58	117.460°W	34.117°N	0.00	1.02

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

PHASE 1 AND 2 ENVIRONMENTAL ASSESSMENTS

EnviroApplications, Inc.
Engineering & Consulting

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT FOR

PROPOSED PROMENADE AT GLEN AVON
Multi-Tenant Commercial Property
North & South Sides of State Route 60
East of the Pyrite Street Exit, Jurupa Valley
(North) Riverside County, CA 92509

EAI Project Number: 80.ECOSYS1.19
August 27, 2019

APNs: 171-020-001, 004, 015, 027, 028 and 030
171-030-001, 004, 005, 013 and 015
173-180-006

Prepared For:

David Urban, Managing Director
Ecosystem Investment Partners
Attn: Glen William, California Projects Director
1505 Bridgeway, Suite 107
Sausalito, CA 94965

Prepared by:

Frederic A. Allee
Chemical/Environmental Engineer

Reviewed by:

Bernard A. Sentianin, PG
senior Project Manager

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ATTACHMENTS

EXECUTIVE SUMMARY

EnviroApplications, Inc. (*EAI*) is pleased to present this Phase I Environmental Site Assessment (ESA) Report. The following table presents an overview of the project, including a summary of our significant findings:

Property Name (Subject Property):	Proposed Promenade At Glen Avon (Mixed Residential and Multi-Tenant Commercial Center Property).
Subject Property Address (and/or Other Physical Location Description):	North & South Sides of State Route 60, East of Pyrite Street, Jurupa Valley, (North) Riverside County, California (CA) 92509.
Subject Property and Area Description:	According to information provided by the Client, the subject property consists of roughly 97-acres of vacant land, including 47-acres to remain undeveloped and open and approximately 50-acres to be developed. The portion of the subject property located north of State Route 60 can be accessed from both Pyrite Street and Granite Hill Drive. The portion of the subject property located to the south of State Route 60 can be accessed from Pyrite Street and is crossed by the Pyrite Storm Water Channel. The subject property is located in a mixed residential, commercial, light-industrial and open reserve land use area of Jurupa Valley along its western boundary with Glen Avon.
Observed Current Subject Property Use/Operations:	The subject property is vacant, (mostly) graded land with no business use or operations currently occurring.

Years	Summary of Subject Property History
From At Least As Early As 1931 – circa 1947	Agricultural (citrus orchard) land in a rural, agricultural and aggregate mining area.
1948 – circa 1974	Agricultural (row crop) land in a rural, agricultural area divided by State route 60.
1975 - 2019	Vacant (fallow) agricultural land in a former rural, agricultural area that became increasingly developed for residential, commercial and light-industrial uses.

CONCLUSIONS AND RECOMMENDATIONS

EAI has performed a Phase I ESA in conformance with the Scope of Work (SOW) required by Title 40 CFR Part 312 (All Appropriate Inquiry; AAI) and ASTM E1527-13, of the Proposed Promenade At Glen Avon (Mixed residential and Multi-Tenant Commercial Center) Property located to the north and south of State Route 60 and East of Pyrite Street in Jurupa Valley, (North) Riverside County, CA 92509. Any exceptions to, or deviations from the SOW are described in this report, where applicable.

The subject property has not come to the attention of the Local (Riverside County DEH), State (Cal/EPA) or Federal (US EPA Region 9) environmental regulatory agencies in association with on-site hazardous materials storage and use or hazardous waste generation. No known manufacturing operations were found to have ever been located on the subject property.

The subject property has several groundwater monitoring wells located on it that are part of the large monitoring well network associated with the Stringfellow Acid Pits Superfund hazardous waste release site, located topographically (and hydrogeologically) up-gradient and adjacent side-gradient of the subject property. No other release sites that qualify as a potential adverse environmental contaminant impact source condition to the subject property were identified in the Environmental Data Resources, Inc. (EDR) government database search report (EDR Report) obtained and reviewed during performance of this ESA.

No issues associated with non-ASTM concerns such as the possible presence of lead-based paint (LBP), mold, asbestos containing material (ACM) or radon gas were identified.

This ESA has revealed the following evidence of ASTM controlled recognized environmental conditions (CRECs) of the subject property:

- Agricultural use (orchard and row crops) from at least as early as 1931 to circa 1974 (43 years) that typically results in the upper one to two feet of soil being impacted by pesticides (that would include DDT, DDE and other organochlorine compounds during this era) in excess of screening concentrations allowed by the agencies due to potential human health impacts.
- Impacts from the releases at the Stringfellow Acid Pits (Superfund) site that has impacted groundwater underlying the subject property with contaminants, including volatile organic compounds (VOCs), that could pose a human health threat due to vapor intrusion into future commercial and residential buildings.

These two ASTM CRECs require Phase II ESA soil and soil vapor sampling and analysis to determine if mitigation measures are required.

No evidence of an ASTM REC or historical REC (HREC) of the subject property was found. See the definitions of these ASTM terms in Attachment 4.

1.0 INTRODUCTION

1.1 Subject Property Name and Location

Subject Property Name:	Proposed Promenade At Glen Avon (Mixed Residential and Multi-Tenant Commercial Center Property).
Street Address:	None (the subject property is located on the north and south sides of State Route 60, East of Pyrite Street in Jurupa Valley, [North] Riverside County, California [CA] 92509).
Assessor's Parcel Nos.:	171-020-001, 004, 015, 027, 028 and 030; 171-030-001, 004, 005, 013 and 015; and 173-180-006.

1.2 Contact Information

Client (User):	Ecosystem Investment Partners.
Subject Property Owners (According to PTIR, See Attachment 2):	Tillie Goldring, Paul Garrett, and Henry S. Hendler, as Trustees under the Will of Max Goldring, Deceased, as to an undivided ½ interest; Irving L. Gronsky and Audrrey V. Gronsky, husband and wife as Community Property as to an undivided ¼ interest; and Henry S. Hendler, Trustee of The Henry S. Hendler Trust dated November 14, 1996, as to an undivided ¼ interest.
ASTM Key Site Manager:	None (vacant land),
Date Project Authorized:	July 23, 2019.

1.3 Objective

This Phase I ESA has been completed in accordance with the practices identified in the ASTM *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, ASTM Designation E1527-05 and pursuant to the terms set forth in the Authorization For Environmental Investigation And Contracting Services (AEICS) between the *EAI* and Ecosystem Investment Partners dated July 23, 2019.

1.4 Scope Of Work, Significant Assumptions, Terms and Conditions, Reliance

The scope of work, significant assumptions, and terms and conditions applicable to this Phase I ESA are identified in the following documents:
AEICS 01-087-19 For *EAI* Project 80.ECOSYS1.19.
ASTM E1527-13 and ASTM E2600-15.

Certifications are presented in Section 2 of this report.
This report was prepared for the exclusive use of the following:
Ecosystem Investment Partners.

2.0 SCOPE AND DECLARATIONS

2.1 Introduction

EAI has completed a Phase I ESA of the subject property. This Phase I ESA Report was prepared for Ecosystem Investment Partners for real estate environmental due diligence purposes. Photographs of the subject and surrounding properties are provided in Attachment 1. The regional and community locations of the subject property are depicted on Figure 1 (Regional Site Location Map) and Figure 2 (Site Location Map). Figure 3 is a Site Plan based on a recent aerial photograph showing the subject property and adjacent property uses. Figure 4 is a tentative map showing the proposed development planned for the subject property. Historical maps showing the subject property in its physiographic setting are included in Attachment 6.

2.2 Scope

The objective of this ESA was to perform all appropriate inquiry (AAI) into the past ownership and uses of the subject property consistent with good commercial or customary practice as outlined by the ASTM in Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation E1527-13. The purpose of this ESA work was to identify, to the extent feasible, adverse environmental conditions (including ASTM recognized environmental conditions; RECs) of the subject property that potentially have and/or may cause an adverse environmental impact to the subject property. The effective date of this ESA is the same as its date of issue. In accordance with ASTM E1527-13 Section 4.6, its continued viability extends to 180 days after its effective date. The viability of this ESA can be extended beyond 180 days, up to one (1) year, if the specific ESA components specified in ASTM E1527-13 Section 4.0 are updated.

2.3 Declarations

Frederic A. Allee and Craig A. Smith of *EAI* declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in Title 40 Code of Federal Regulations (CFR) Part 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in Title 40 CFR Part 312.

The term REC is defined by ASTM Standard E 1527-13 as:

"…the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property due to release to the environment; under conditions indicative of a release to the environment or under conditions that pose a material threat of future release."

The term does not include de minimis conditions, which generally do not present a material risk to human health or the environment and would not likely be subject to enforcement action if brought to the attention of governmental agencies. An example of such a de minimis condition would be the engine oil stains typically present on the pavement surfaces of parking spaces due to minor leaks from parked vehicles.

The SOW for this ESA consisted of a visual reconnaissance of the subject property, interviews, review of historical aerial photographs, maps and telephone directories, a current Environmental Data Resources, Inc. Report (EDR Report), and, a review of the practically available pertinent records of local, state, and federal agencies. The SOW did not include an assessment for historical overall environmental regulatory compliance of every facility or entity that ever operated at the subject property or sampling and analyzing of environmental media. *EAI* was not contracted to perform any independent evaluation of the purchase or lease price of the subject property and its relationship to current fair market value. The conclusions presented in this ESA Report are professional opinions based on data described herein. Any data gaps resulting from the ESA described in this report are listed and discussed in the following table:

Deletions or Exceptions From SOW Referenced in Section 1.4:	None.
Weather-Related Restrictions to Site Reconnaissance:	None.
Facility Access Restrictions to Site Reconnaissance:	None.
Other Site Reconnaissance Restrictions:	None.
Data Gaps from Environmental Records Review:	None.
Data Gaps from Historical records Review:	No historical Sanborn fire insurance industry map coverage was found for the subject property and surrounding area. This data gap does not alter the conclusions of this report, since adequate historical aerial photograph coverage was obtained.
Data Gaps from Interviews:	None.
Other Data Gaps:	No environmental cleanup lien search report was provided by the ASTM User for the subject property. This data gap does not affect the ESA findings since a Preliminary Title Insurance Report (PTIR) was provided that indicates no cleanup liens or other activity and use restrictions for the subject property.

No other entity may rely on the information presented in the report without the expressed written consent of *EAI*. Any use of this Phase I ESA report constitutes acceptance of the terms

and conditions under which it was prepared. The liability of *EAI* extends only to its Client, Ecosystems Investment Partners and their assigns, and not to any third or other parties who may obtain copies of this Phase I ESA Report.

3.0 USER-PROVIDED INFORMATION

Prior to initiating a reconnaissance visit to the subject property, *EAI* reviewed information relevant to performance of this Phase I ESA received from the Client/ASTM User Ecosystem Investment Partners for the subject property.

3.1 Information

1) Past Uses	Agricultural (farming and ranching).
2) Current Conditions	Vacant land.
Reason Why the User Wants to Have this Phase I ESA Performed:	Phase I ESA Report prepared as a requirement of Ecosystems Investment Partners for real estate development environmental due diligence purposes.

3.2 User-Provided Documents

The following documents were provided by Ecosystems Investment Partners to *EAI* and are summarized as follows:

PTIR, Orange Coast Title Co. of Ontario, CA, dated May 8, 2019 (includes Riverside County Assessor's Tax and other maps)	Provides current ownership information, property tax and title history, but contains no information regarding the environmental condition of the subject property parcels (Attachment 2).

4.0 SUBJECT PROPERTY AND AREA RECONNAISSANCE

The reconnaissance visit to the subject property was conducted by *EAI* on August 7, 2019. *EAI* was unaccompanied during the reconnaissance visit.

4.1 Site Reconnaissance Methodology

EAI utilized the following methodology to observe the subject property:
Walked the reasonably accessible exterior areas of the subject property and boundaries.
Observed adjacent property areas from public thoroughfares.

4.2 General Description

Subject Property and Area Description:	The subject property is undeveloped and divided in two by Highway 60. The portion north of Highway 60 consists of six legal parcels encompassing approximately 52 acres. This portion is bounded by Pyrite Street and industrial property to the west, industrial property and undeveloped land to the north, undeveloped land to the east, and by Granite Hill Drive and Highway 60 to the south. The portion of the subject property south of Highway 60 is undeveloped and consists of six legal parcels encompassing approximately 45 acres. This portion is bounded by Pyrite Street to the west, Highway 60 to the north, rural residential and commercial properties to the east, and by Mission Boulevard to the south.
Structures, Roads, Other Improvements:	There are no structures or paved roads on the subject property. Unpaved roads are present on both the northern and southern portions. Fencing is present along the State Route 60 right-of-way boundary with the subject property. A concrete-lined storm water drainage ditch called the Pyrite Channel is present across the western-end area on the southern portion (with fencing along both sides), approximately 250 east of Pyrite Street and oriented in a north-south direction. A concrete culvert and associated partially-lined drainage channel was also observed just south of Highway 60, approximately 1,200 feet east of Pyrite Street.
Subject Property Size:	Approximately 97 acres.
Estimated % of Property Covered by Buildings/Pavement:	0 (none, based on reconnaissance visit).

Observed Current Subject Property Use/Operations:	The subject property vacant and undeveloped. There were no observable operations or recognized uses noted.
Observed Evidence of Past Subject Property Use(s):	None observed or reported to be present.
Sewage Disposal Method (and age):	The Jurupa Community Services District (JCSD) services the subject property area.
Emergency Generator	None observed or reported to be present.
Potable Water Source:	The JCSD services the subject property area.
Gas & Electric Utility:	Southern California Edison (SCE) services the subject property area.

4.3 Hazardous Substances and Petroleum Products

EAI made the following visual observations during the subject property reconnaissance visit and identified the following information about hazardous substances at the subject property during the interview/records review portions of the ESA:

Observation	Description
Hazardous Substances and Petroleum Products:	None observed.
Drums (≥ 5 gallons):	None observed.
Strong, Pungent, or Noxious Odors:	None observed.
Pools of Liquid:	None observed.
Unidentified Substance Containers:	None observed.
PCB-Containing Equipment:	None observed.
Other Observed Evidence of Hazardous Substances or Petroleum Products:	None.

4.4 Interior Observations

There are no buildings or other structures on the subject property, therefore this ASTM ESA reconnaissance SOW item does not apply.

4.5 Exterior Observations

EAI made the following observations during the reconnaissance of exterior areas of the subject property and/or identified the following information during the interview or records review portions of the assessment:

Observation	Description
On-site Pits, Ponds, or Lagoons:	None observed.
Stained Soil or Pavement:	None observed.
Stressed Vegetation:	None observed. However, some minor past brush fire evidence was observed in the northeast portion of the subject property.
Waste Streams and Waste Collection Areas:	None observed.
Solid Waste Disposal:	None observed or reported to be occurring (see other observations).
Potential Areas of Fill Placement:	None observed or reported to exist.
Wastewater:	No potential sources observed.
Storm water:	Storm water appears to drain off the subject property southward into main-made drainage channels. The subject property is not listed on the National Pollutant Discharge and Elimination System (NPDES) database in the EDR Report (Attachment 3). No indication of a discharge that would require a NPDES permit was observed.
Wells:	No water supply wells were observed. Surface completions for groundwater monitoring wells associated with the west-adjacent Stringfellow Acid Pits hazardous waste release site and its associated contaminant plume were observed on the subject property. Two were observed on the portion north of Highway 60 (labeled MW-16 and MW-17B) and seven sets (clusters) of monitoring well surface completions were observed on the portion of the subject property south of Highway 60 (labeled MW-18b, C115A2, FC-1, FC-3, and SV, the rest were unlabeled or illegible).
Septic Systems:	None observed or reported to exist.
Electromagnetic Radiation Source:	No high-voltage electrical power transmission lines or other potential sources of elevated electromagnetic radiation were observed on the subject property. East-west trending distribution lines were noted just south of Highway 60.

Other Exterior Observations:	Numerous waste tires have been dumped on the subject property, with the majority located on the portion to the south of State Highway 60. Several loads of broken concrete demo material, along with old household appliances and furniture were also observed. What appeared to be an abandoned homeless encampment, burnt-out van and burned debris was noted in the eastern area of the subject property, just south of Highway 60.

4.6 Underground Storage Tanks/Structures

Existing USTs:	None observed.
Former USTs:	No evidence observed.
Other Underground Structures:	None observed, aside from existing storm ditches/channels.

4.7 Aboveground Storage Tanks

Existing ASTs:	None observed.
Former ASTs:	No evidence observed.

4.8 Adjoining Properties

4.8.1 Current Uses of Adjoining Properties

As viewed from the subject property and/or from public rights-of-way, *EAI* made the following observations about use and activities on adjoining properties:

North:	The Stringfellow Acid Pits remediation compound containing monitoring, observation, and extraction wells, parking lot for a nearby auto salvage yard and vacant land (subject property north of Highway 60). Highway 60 runs along the northern boundary of the subject property southern portion.
East:	Vacant Land (subject property portion north of Highway 60). Rural residential and commercial properties (portion South of Highway 60).
South:	Highway 60 and Granite Hill Drive run along the boundary of the subject property portion north of Highway 60. The Mission Boulevard roadway followed by single-family residences (SFRs) and the Jurupa Hills Mobile Park (portion south of Highway 60).
West:	Pyrite Street and the Stringfellow Acid Pits remediation system compound (subject property portion north of Highway 60). The Pyrite Street roadway followed by SFRs and the Molina Income Tax Services office (portion south of State Route 60).

4.8.2 Observed Evidence of Past Uses of Adjoining Properties

Observations of adjoining properties providing indications of past use and activities, if any, are described as follows:

North:	None observed.
South:	None observed.
East:	None observed.
West:	None observed.

4.8.3 Pits, Ponds or Lagoons on Adjoining Properties

As viewed from the subject property and/or from public right-of-ways, *EAI* made the following observations about the presence of pits, ponds and lagoons on adjoining properties:

North:	None observed.
South:	None observed.
East:	None observed.
West:	None observed.

4.9 Observed Physical Setting

Topography of the Subject Property and Surrounding Area:	The topography of the subject property and surrounding area is moderately to steeply sloped downward from north to south (portion north of State Highway 60) and relatively flat with a gradual, overall slope downward to the south (portion south of Highway 60).

4.10 Summary of Findings From Subject Property Reconnaissance

There were no observed potential adverse environmental conditions and no evidence of an ASTM REC or Historic REC (HREC) of the subject property based on the reconnaissance visit. The presence of groundwater monitoring wells on the subject property and the close proximity of the former Stringfellow Acid Pits (as evidenced by the adjacent remediation system compound) qualifies as an ASTM controlled REC (CREC) of the subject property.

5.0 PHYSICAL SETTING

Topography:	The subject property has an approximate, average surface elevation of 957 feet above mean sea level (AMSL). Area topography slopes downward to the south toward the Santa Ana River, located approximately 4-miles away.
Soil/Bedrock Data:	The subject property lies within the Peninsular Ranges Geomorphic Province. This region is underlain predominately by Cretaceous-age undifferentiated granitic rocks of the Southern California Batholith. Overlying the tonalite and granodiorite batholiths (bedrock) in the area of the subject property is recent alluvium deposited by Pyrite Creek. The alluvium is described as sand, silt and gravel in multiple, previously-existing streambeds.
Estimated Depth to Groundwater:	Based on data collected for the Stringfellow Acid Pits environmental release site, depth to groundwater would be expected to average 80 feet below ground surface (bgs) beneath the portion of the subject property north of Highway 60 and 65 feet bgs south of Highway 60. The subject property is located in a semi-arid climate and the depth to groundwater can vary greatly depending on seasonal rainfall.
Estimated Direction of Gradient:	Groundwater movement is to the south toward the Santa Ana River.
Known Regional Groundwater Impairment:	The Stringfellow Acid Pits environmental release site has an associated groundwater contaminant plume that extends from the former hazardous waste disposal pits area to the north of the subject property in Pyrite Canyon all the way past both portions of the subject property and south-southwestward to the Santa Ana River.

Sources of this information:

- California Department of Conservation, Division of Mines and Geology, Geology of the Fontana, CA, Topographic Quadrangle, 2006, Reprint.
- 2018 Annual Groundwater Sampling And Analysis Report, Stringfellow Superfund Site, Riverside, CA, February 2019, US EPA and Cal/EPA.
- USGS Topographic Map, Fontana, CA Quadrangle, 2012 (Attachment 6).
- EDR Report (Attachment 3).
- Santa Ana Regional Water Quality Control Board (SARWQCB), 2013, Basin Plan.

6.0 ENVIRONMENTAL RECORDS REVIEW

6.1 Federal, State and Tribal Environmental Records

A government agency database search report was obtained from Environmental Data Resources, Inc. (EDR), a third-party environmental database search firm. A complete copy of the database search report, including the date the report was prepared, the date the information was last updated, and the definition of databases searched, is provided in Attachment 3.

EAI evaluated the properties listed within the EDR Report on the basis of their potential to environmentally impact the subject property. As part of this process, inferences have been made regarding the likely groundwater movement direction (south toward the Santa Ana River). The following table summarizes the listings:

Agency List/Database	Search Radius	Number of Listed Sites	ASTM REC?
Federal NPL Sites	**1.0 mile**	**1**	**No (CREC)**
Federal Delisted NPL Sites	1.0 mile	0	No.
Federal CERCLIS List	0.5 mile	1 (SEMS)	No.
Federal CERCLIS NFRAP List	0.5 mile	0	No.
Federal RCRA CORRACTS Facilities	1.0 mile	0	No.
Federal RCRA Non-CORRACTS TSDF	0.5 mile	0	No.
Federal RCRA SQG Generators	0.25 mile	2	No.
Federal RCRA CESQG/LQG Generators	0.25 mile	0 (LQG) 1 (CESQ)	No.
Federal RCRA Non-Gen/NLR	0.25 mile	0	No.
Federal ERNS	Subject Property	Not Listed.	No.
State and Tribal - Equivalent NPL (a.k.a. RESPONSE)	1.0 mile	0	No.
State and Tribal - Equivalent CERCLIS (a.k.a. ENVIROSTOR)	1.0 mile	4	No.
State and Tribal Solid Waste Facilities (a.k.a. SWF/LF); Toxic Pits (TP)	0.5 mile	0	No.
State and Tribal Registered Storage Tank Sites (a.k.a. UST & AST)	0.25 mile	0	No.

Agency List/Database	Search Radius	Number of Listed Sites	ASTM REC?
State and Tribal Leaking Storage Tank Sites (a.k.a. SLIC & LUST)	0.5 mile	1 LUST 1 SLIC	No.
State and Tribal Voluntary Cleanup Sites	0.5 mile	1 (State) 0 (Tribal)	No.
Brownfield Sites	0.5 mile	0	No.
Local Lists of Registered USTs (a.k.a. CA FID / HIST / SWEEPS / CERS)	0.5 mile	0 / 0 / 0 / 2	No.
SWRCY	0.5 mile	0	No.
Local Lists of Hazardous Waste/Contaminated Sites (a.k.a. Riverside County DEH)	0.25 mile Subject Property	0 Not Listed	No.
Local Land Records (Liens 2)	Subject Property	Not Listed	No.
Drycleaners	0.25 mile	0	No.
EDR Historical Cleaners	0.25 mile	0	No.
EDR Historical Auto Stations	0.25 mile	0	No.
EPA FINDS, NPDES, EMI, HAZNET	Subject Property	Not Listed	No.

6.1 Listings For Subject Property

The subject property parcels are not included in the EDR Report maps or listings. The adjacent US EPA Stringfellow Superfund Site and its associated contaminant plume qualifies as an ASTM CREC of the subject property. See Page 112 of the EDR Report for a complete listing of the confirmed contaminants of concern (COC) and potential COC associated with the hazardous waste release site.

6.2 Listings for Nearby Sites with Potential to Impact Subject Property

The listings (including those with poor or inadequate address information a.k.a. Orphan Sites) in the EDR Report, provided in Attachment 3, were evaluated in accordance with the *Database Assessment Criteria* presented in Attachment 4 and determined to not qualify as potential sources of impact and/or ASTM RECs of the subject property.

Oil & Gas Wells

The California Department of Conservation, Division of Oil, Gas and Geothermal Resources database and confirmed that there are no existing or abandoned oil/gas wells or dry holes present on, or within a 1-mile radius of the subject property.

6.3 Local/Regional Environmental Records

EAI checked the following sources to obtain information pertaining to subject property use and/or indicative of potential RECs in connection with the subject property.

6.4 Local Environmental Health Department

Agency Name, Contact Information	Finding
Riverside County Department of Environmental Health (RCDEH) California Unified Program Agency (CUPA): Service Counter – (951) 358-5055, 4065 County Circle Drive, Riverside, CA 92503	*EAI* visited the public service counter of the RCDEH and confirmed (as indicated in the EDR Report) that there are no CUPA or other RCDEH records for the subject property listed in their customer databases.

6.5 Fire Department

Agency Name, Contact Information	Finding
Riverside County Fire Department (RCFD): Service Counter – (951) 358-5055, 210 W. San Jacinto Ave., Perris, CA 92570	*EAI* visited the public service counter at the RCFD Administrative Headquarters and confirmed that there were no records for the subject property APNs.

6.6 Building Department

Agency Name, Contact Information	Finding
Jurupa Valley Development Services Department (JVDSD): Deidra Mendoza – (951) 332-6464, 8930 Limonite Ave., Jurupa Valley, CA92509	*EAI* visited the public service counter at the JVDSD and confirmed that there were no records for the subject property APNs.

6.7 State Environmental Departments

Agency Name, Contact Information	Finding
DTSC (Cal/EPA): Jone Barrio - Jone.Barrio@dtsc.ca.gov	The response from the DTSC indicates they have no files pertaining to the subject property APNs (Attachment 5).

SARWQCB (Cal/EPA): File Review Desk – Filereview8@ waterboards.ca.gov	The SARWQCB responded that they have no records associated with the subject property (Attachment 5).

6.8 Air District

Agency Name, Contact Information	Finding
South Coast Air Quality Management District (SCAQMD): Facility Information Detail (FIND)	*EAI* conducted a mapped permitted facility search on the SCAQMD FINDS web-based public records database for the subject property area. No records were found (Attachment 5).

6.9 Industrial Wastewater Agency

The subject property is vacant land with no manufacturing, or other types of processes, that produce industrial wastewater.

6.10 Discussion and Summary of Findings from Environmental Records Review

There are no subject property listings in the EDR Report. The SMFD and SMBD records do not indicate an ASTM REC of the subject property. No records for the subject property were found at the DEH, CA DHCD, Cal/EPA, APCD or SMIWD.

7.0 HISTORICAL RECORDS REVIEW

7.1 Land Title Records/Deeds

The Client provided a copy of a PTIR for the subject property prepared by Orange Coast Title Co. of Ontario, CA, dated May 8, 2019. The PTIR indicates that ownership of the subject property parcels is vested in Tillie Goldring, Paul Garrett, and Henry S. Hendler, as Trustees under the Will of Max Goldring, Deceased, as to an undivided ½ interest; Irving L. Gronsky and Audrrey V. Gronsky, husband and wife as Community Property as to an undivided ¼ interest; and Henry S. Hendler, Trustee of The Henry S. Hendler Trust dated November 14, 1996, as to an undivided ¼ interest.

7.2 Environmental Cleanup Lien Search

A search for environmental cleanup lien(s) which might exist against the subject property parcel was not conducted by the ASTM User, since there is no indication that any environmental release or subsequent cleanup has ever occurred at the subject property. The PTIR provided by the Client does not indicate that there are any liens or activity and use restrictions on the the subject property parcels.

7.3 Aerial Photographs

EAI contracted with EDR to provide historical aerial photographs of the subject property and surrounding area (all at a scale of 1" = 500'). The following table summarizes the features observed during a review of the photographs:

Year(s)	Observations, Subject Property and Adjoining Properties
1931 1938	The subject property appears to be fruit tree (citrus) orchard land in an open, rural, agricultural and aggregate mining land use area. Highway 60 does not yet exist through the area. Pyrite Canyon and Creek are clearly visible.
1948 1953 1959	The subject property now appears to be agricultural row crop land. Highway 60 is present as is Pyrite Street to the west and Mission Blvd. to south. The orchards are being replaced by SFRs in the area by the 1959 photo.
1967 1975	The subject property still appears to be farmland in the 1967 photo, but is fallow by the time of the 1975 photo. The currently existing Pyrite Street on and off ramps for Highway 60 are present in the 1975 photo.
1985, 1990 1994, 2006 2009, 2012 2016	The subject property and surrounding area appear similar to the way they did during the reconnaissance visit for this ESA.

No potential environmental impact concerns were observed in the aerial photographs. Copies of the 1931 – 2016 photographs are included in Attachment 6.

7.4 City Directories

EAI retained EDR to review available Polk's, Frye & Smith, Pacific Telephone, Haines and other reverse city telephone directories for the area of the subject property. EDR found directories for the years 1921 through 2014. The following table summarizes the listings found for the subject property area in the directories (the subject property is vacant land and has no associated addresses):

Directory Year(s) Listed	Listed Addresses	Occupant(s) Listed
1921 – 1954	No Listings In Area.	None.
1955	3812 Pyrite Street	WJ Durette
1986 - 2002	3851 Pyrite Street	Appliance Recycling An Appliance Recycling Factory, Clarke Family, TLC Refinishing
2001 -2002	3873 Pyrite Street	Texaco
2003 - 2014	No Listings In Area.	None.

No business or other listings for the subject property were found in the directories. The listings for the surrounding area do not indicate a potential environmental impact consequence to the subject property.

7.5 Historical Fire Insurance Maps

Fire insurance maps were developed for use by insurance companies to depict facilities, properties, and their uses for many locations throughout the United States. These maps provide prior land use history and assist in assessing whether or not there may be potential environmental contamination in a given location. These maps, which were periodically updated from the late 19th Century into the 1980s (when they were replaced with high definition aerial and satellite photography-based maps), often provide valuable insights into historical property uses. *EAI* contracted with EDR to provide copies of historical Sanborn® fire insurance maps covering the subject and immediately adjacent properties.

There is no historical fire insurance industry (Sanborn) map coverage for the subject property area according to EDR. A copy of their no maps found notification is included in Attachment 6.

7.6 Historical Topographic Maps

EAI reviewed U.S. Geological Survey (USGS) maps of the subject property and surrounding area provided by EDR. The following table summarizes the USGS map review results:

Year(s)	Scale(s)	Observations
1896	1:24,000	The subject property and surrounding area are open land.

1898 1901	1:52,000	The subject property and surrounding area are open land. Pyrite Creek is depicted but not labeled. Unlabeled roadways are shown on the 1901 map.
1942 1953	1:24,000	The subject property and surrounding area are open land. Mission Blvd. is present and labeled as State Highway 60. Quarries are depicted in Pyrite Canyon and along Pyrite Creek. The CAMWD aqueduct is shown where it passes through the area. State Highway 60 is present on the 1953 Map in its current alignment.
1967, 1973 1975, 1980 2012	1:24,000	The subject property and surrounding area are open land. The hazardous waste dumping ponds at the Stringfellow Superfund Site (not labeled) are shown in the northern end of Pyrite Canyon.

There are no indicators of potential ASTM RECs depicted on the maps. Copies of the topographic maps are included in Attachment 6.

7.7 Other Historical Sources

No other historical sources were found during this ESA.

7.8 Summary of Findings from Historical Records Review

The historical records reviewed indicate that the subject property was historically agricultural (orchards, row crops) land from at least as early as 1931 until circa 1974. It has been vacant, graded land since 1975. The surrounding area was originally agricultural and aggregate mining land that became developed with residential and commercial buildings and yards. The use of the subject property as farmland during the organochlorine pesticide use era (including DDT and DDE) qualifies as an ASTM CREC of the subject property since the pesticides (and other agricultural chemicals) were (presumably) applied to the subject property in accordance with manufacturers specifications and government regulations in effect at the time. Additionally, no agricultural chemical mixing sheds or yards were observed on the subject property in the historical aerial photos.

No historical records or information reviewed indicated a potential ASTM HREC or REC of the subject property.

8.0 INTERVIEWS

8.1 Findings From Interview With Client/ ASTM User

Responses to the AAI questions asked during the arrangements to receive the previously prepared environmental assessment documents are summarized as follows:

Name, Title, Telephone, Years Familiar with subject property:	Glen Williams, California Projects Director, 1.415.465.4423, familiar with the subject property for more than six months.
Are you aware of any environmental cleanup liens against the subject property that are filed or recorded under federal, tribal, state or local law? If yes, explain:	No.
Are you aware of any environmental cleanup liens against the subject property that are filed or recorded under federal, tribal, state or local law? If yes, explain:	No.
Are you aware or any activity and land use limitations (ALLs), such as engineering controls, land use restrictions or institutional controls that are in place at the subject property and/or have been filed or recorded in a registry under federal, tribal, state or local law? If yes, explain:	No.
Do you have any specialized knowledge or experience related to the subject property or nearby properties?	Yes, have reviewed 2018 ESA, Soil Vapor Survey and other reports (copies provided to *EAI*).

In your opinion does the purchase price being paid for the subject property reasonable reflect the fair market value of the property?	No opinion.
Are you aware of commonly known or reasonably ascertainable information about the subject property that would help the environmental professional to identify conditions indicative of releases or threatened releases?	Yes, copies of previous environmental assessment reports and documentation provided to *EAI*.
Do you know anything about the past use of subject property?	Yes, farming uses described in previous reports.
Do you know of specific chemicals that are present or once present at the subject property?	No.
Do you know of spills or other chemical releases that have taken place at the subject property?	No.
Do you know of any environmental cleanups that have taken place at the subject property?	No.

Based on your knowledge and experience related to the subject property, are there any obvious indicators that point to the presence or likely presence of contamination at the subject property?	No, although the Stringfellow Superfund site is adjacent to the subject property.
Are you aware of any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the subject property?	No.
Are you aware of any correspondence from any government agency relating to past or current violations of environmental laws with respect to the subject property?	No.
Do you know whether any documents such as reports, environmental reports, permits, registrations, manifests exist related to the subject property? If so, list:	Yes, copies of previous environmental assessment reports and documentation provided to *EAI*.

8.2 Summary of Findings from Interview

Based on the interview responses summarized above, the interview information obtained does not indicate the existence of a potential ASTM REC and/or HREC of the subject property.

9.0 SUMMARY OF HISTORICAL SUBJECT AND ADJOINING PROPERTY USES

The following summary of the historical uses of the subject property and adjoining properties was compiled from the referenced materials and interviews detailed in Sections 5.0, 6.0, and 7.0.

9.1 Subject Property Use

Year	Summary of Subject Property Use
From At Least As Early As 1931 – circa 1947	Agricultural (citrus orchard) land in a rural, agricultural and aggregate mining area.
1948 – circa 1974	Agricultural (row crop) land in a rural, agricultural area divided by State route 60.
1975 - 2019	Vacant (fallow) agricultural land in a former rural, agricultural area that became increasingly developed for residential, commercial and light-industrial uses.

9.2 Surrounding Property Use

Direction	Summary of Historical Adjoining Property Use
North:	Originally open land with portions quarried for aggregate that became occupied by the Stringfellow Acid Pits Superfund release site remediation compound containing monitoring, observation, and extraction wells, parking lot for a nearby auto salvage yard and vacant land (subject property north of Highway 60). Highway 60 runs along the northern boundary of the subject property southern portion.
East:	Vacant Land (subject property portion north of Highway 60). Former agricultural orchard land that became redeveloped with rural residential and commercial properties (portion South of Highway 60).
South:	Highway 60 and Granite Hill Drive run along the boundary of the subject property portion north of Highway 60. The Mission Boulevard roadway followed by former agricultural orchard land that became redeveloped SFRs and the Jurupa Hills Mobile Park (portion south of Highway 60).
West:	Pyrite Street and former agricultural land that became fallow and is now occupied the Stringfellow Superfund Site release remediation system compound (subject property portion north of Highway 60). The Pyrite Street roadway followed by former orchard land that became developed with SFRs and the Molina Income Tax Services office (portion south of State Route 60).

10.0 OTHER AND NON-ASTM ENVIRONMENTAL CONSIDERATIONS

10.1 Lead-Based Paint

There are no structures and no known concerns regarding lead-based paint (LBP) associated with the subject property.

10.2 Asbestos

There are no structures and no known concerns regarding asbestos containing materials (ACMs) associated with the subject property.

10.3 Flood Zones

EAI reviewed the Federal Emergency Management Agency (FEMA) flood insurance rate maps information for the subject property presented in the EDR Report. They indicate the subject property is not located in either a 100-year or 500-year flood zone. A copy of the EDR Report is included as Attachment 3 of this report. The information is summarized on the following table:

FLOOD INSURANCE RATE MAPS	
Map Source & Name:	EDR Report – FEMA Panel 06065C 0039G - DFIRM Flood Data.
Subject Property Within 100-Year Flood Plain:	No.
Subject Property Within 500-Year Flood Plain:	No.

10.4 Wetlands

Wetlands cannot be definitively identified through visual observation alone. Defensible wetland delineations require taxonomic classification of subject site vegetation, an investigation into the surface and subsurface hydrology of the subject property, and identification of hydric soils. This level of delineation is outside of the scope or work for this assessment. However, *EAI* reviewed US Fish and Wildlife Service National Wetland Inventory maps and USDA Soil Survey reports included in the EDR Report. No wetlands are mapped on or near the subject property.

10.5 Indoor Air Quality

EAI identified the Stringfellow Superfund Site as a volatile organic compound (VOC) release site located hydrogeologically up-gradient, and immediately side-gradient, of the subject property that could act as a source of contamination to soil gas underlying the subject property.

Based on the data contained in the EDR Report (Attachment 3), the potential for subsurface contaminant vapor having reached the subject property boundaries, defined by ASTM Standard E2600-15 as a Vapor Encroachment Condition (VEC), is moderate to high. An

ASTM VEC is a concern due to potential VOC vapor intrusion from the subsurface upwards and into one or more of the future subject property commercial and residential buildings.

10.6 Radon

Radon is a colorless, tasteless radioactive gas with a U.S. Environmental Protection Agency (EPA) specified action level of 4.0 picocuries per liter (pCi/L) of air. Radon gas has a very short half-life of 3.8 days. The health risk potential of radon is associated with its rate of accumulation within confined areas, particularly confined areas near to the ground, where vapors can readily transfer to indoor air from the ground through foundation cracks or other pathways. Large, adequately ventilated rooms generally present limited risk for radon exposure. According to the EPA, the radon concentrations in buildings and homes depend on many factors, including soil types, temperature, barometric pressure, and building construction.

EAI reviewed the California Department of Health Services (CDHS) Radon Database for California (last updated in May 2010) and found that in zip code area 92509 where the subject property is located, twelve (12) tests were taken as part of the survey. The 92509 zip code area test results indicated none (0) of the air samples in the zip code area of the subject property had a radon level that was greater than 4.0 pCi/L, the concentration beyond which EPA recommends action be taken to lower radon gas exposure as indicated in the following summary table:

Subject property Location:	**State**	**County & Zip Codes**
	California	Riverside 92509
EPA Radon Zones (with Average Measured Indoor Radon Concentrations)		
Zone 1 – High (> 4.0 pCi/L)	Zone 2 - Moderate (2 to 4 pCi/L)	Zone 3 – Low (< 2 pCi/L)
No.	No.	Yes.
Normally-occupied sub grade areas (i.e., basements, etc.)?		
No (None Exist).		

Information regarding the presence of radon at the subject property relies on regional data and does not represent site-specific data. Based on the Federal EPA Radon Zone rating and CDHS survey results, radon is not expected to represent an environmental impact risk at the subject property and no further consideration appears to be warranted.

10.7 Dry-Cleaning Operations

No dry-cleaning operations were reported or observed to be at or near the subject property. The EDR Report and historical review did not indicate a potential for past dry-cleaning shops operating solvent-based equipment on the subject property or in the vicinity.

10.8 Pesticides & Other Agricultural Chemicals

The historical research for this ESA indicate that the subject property was agricultural land (orchard and row crops) from at least as early as 1931 to circa 1974 (43 years). The use of

land for farming typically results in the upper one to two feet of soil being impacted by pesticides (that would include DDT, DDE and other organochlorine compounds during the 1930s through early 1970s era) in excess of screening concentrations allowed by the agencies due to potential human health impacts.

10.9 Mold

There are no structures and no known concerns regarding mold associated with the subject property.

11.0 OPINION AND CONCLUSIONS

EAI has performed a Phase I ESA in conformance with the SOW required by Title 40 CFR Part 312 (All Appropriate Inquiry; AAI) and ASTM E1527-13, of the Proposed Promenade At Glen Avon (Mixed Multi-Tenant Commercial Center and Residential) Property located to the north and south of State Route 60 and East of Pyrite Street in Jurupa Valley, (North) Riverside County, CA 92509. Any exceptions to, or deviations from the SOW were described in this report, where applicable.

The subject property has not come to the attention of the RCDEH, Cal/EPA or US EPA Region 9 environmental regulatory agencies in association with on-site hazardous materials storage and use or hazardous waste generation. No known manufacturing operations were found to have ever been located on the subject property.

The subject property has several groundwater monitoring wells located on it that are part of the large monitoring well network associated with the Stringfellow Acid Pits Superfund hazardous waste release site located topographically (and hydrogeologically) up-gradient and adjacent side-gradient of the subject property. No other release sites that qualify as a potential adverse environmental contaminant impact source condition to the subject property were identified in the EDR Report obtained and reviewed during performance of this ESA.

No issues associated with non-ASTM concerns such as the possible presence of LBP, mold, ACMs or radon gas were identified.

This ESA has revealed the following evidence of ASTM CRECs of the subject property:

- Agricultural use (orchard and row crops) from at least as early as 1931 to circa 1974 (43 years) that typically results in the upper one to two feet of soil being impacted by pesticides (that would include DDT, DDE and other organochlorine compounds during this era) in excess of screening concentrations allowed by the agencies due to potential human health impacts.
- Impacts from the releases at the Stringfellow Acid Pits (Superfund) site that have impacted groundwater underlying the subject property with contaminants, including volatile organic compounds (VOCs), that could pose a human health threat due to vapor intrusion into future commercial and residential buildings.

These two ASTM CRECs require Phase II ESA soil and soil vapor sampling and analysis to determine if mitigation measures are required.

No evidence of an ASTM REC or HREC of the subject property was found. See the definitions of these ASTM terms in Attachment 4.

12.0 LIMITATIONS

The conclusions and recommendations contained in this report/assessment are based upon professional opinions with regard to the subject matter. These opinions were prepared in accordance with generally accepted environmental consulting and engineering standards and practices applicable to this location and existing at this time. The use of this report is subject to the following limitations:

1. The data and findings presented in this report are valid as of the dates when the investigations were performed. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration at the Subject Property, analysis of the data, and reevaluation of the findings, observations, and conclusions expressed in the report.
2. The data reported and the findings, observations, and conclusions expressed in the report are limited by the Scope of Work, budget, site access and schedule, as defined in EnviroApplications's Proposal for the work.
3. This report is based, in part, on unverified information supplied to EnviroApplications by third-party sources, such as regulatory agencies, prior owners or operators of the property, analytical laboratories, subcontractors, etc. Whereas efforts may have been made to substantiate this third-party information, EnviroApplications cannot guarantee the completeness or accuracy of this information.
4. The findings, observations, and conclusions expressed by EnviroApplications in this report are not, and should not be, considered an opinion concerning the compliance of any past or present owner or operator of the Subject Property with any Federal, state or local law or regulation.
5. No warranty or guarantee, whether expressed or implied, is made with respect to the data or the reported findings, observations, and conclusions, which are based solely upon conditions in existence at the time of investigation.
6. EnviroApplications reports present professional opinions and findings of a scientific and technical nature. Whereas attempts were made to relate the data and findings to applicable environmental laws and regulations, the report shall not be construed to offer a legal opinion or representations as to the requirements of, nor compliance with, environmental laws, rules, regulations or policies of Federal, state or local governmental agencies. Issues raised by the report should be reviewed by appropriate legal counsel.
7. This report is intended for the use of EnviroApplications Client, Ecosystem Investment Partners; any other use must be approved by EnviroApplications and the Client in writing. If any such unauthorized use occurs, it shall be at the user's sole risk without liability to EnviroApplications.

FIGURES

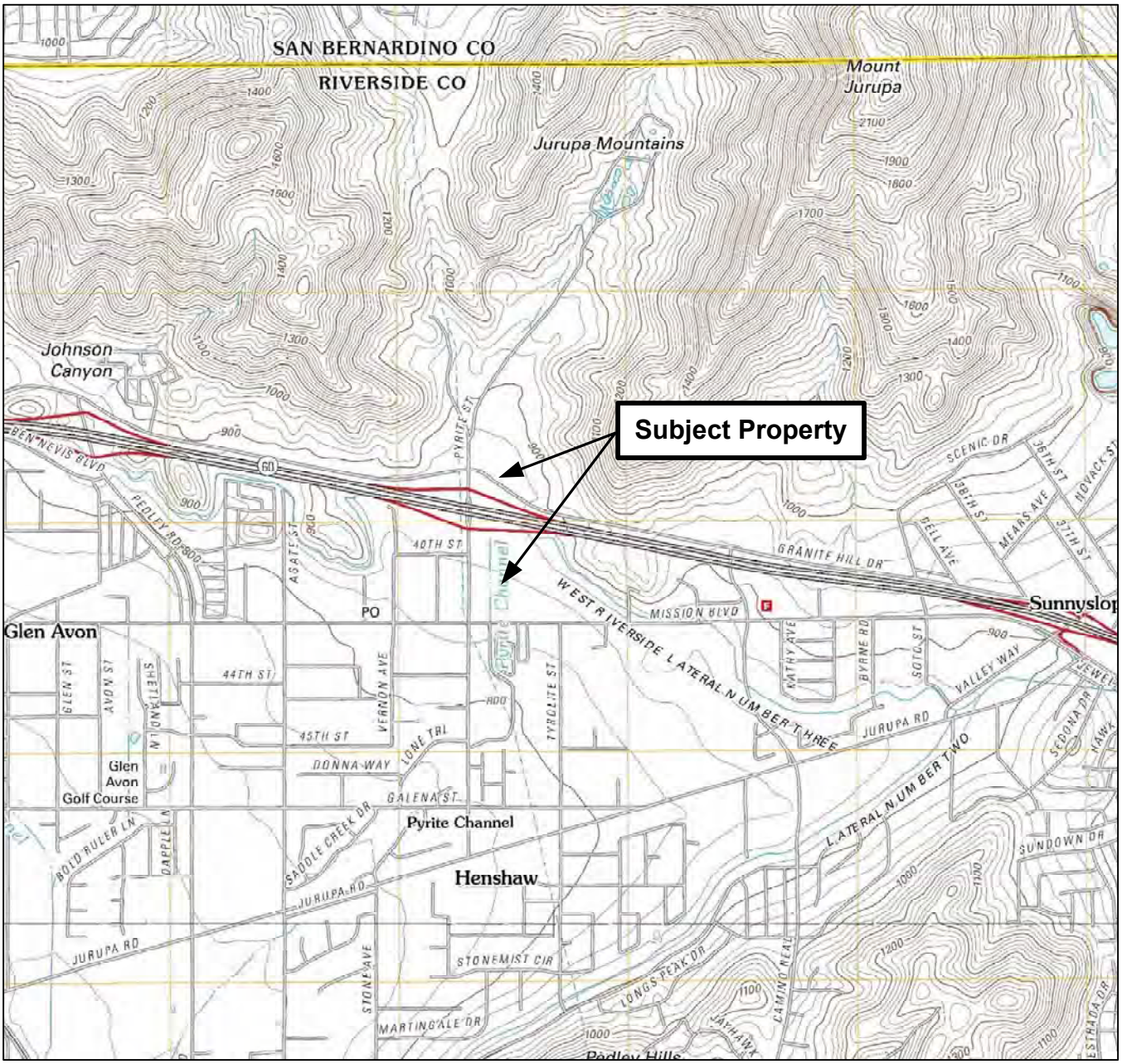
PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

Promenade At Glen Avon Property
North & South Sides of State Route 60
East of The Pyrite Street Exit, Jurupa Valley
(North) Riverside County, CA 92509

August 27, 2019

EAI Project No.: 80.ECOSYS1.19

APNs: 171-020-001, 004, 015, 027, 028 and 030
171-030-001, 004, 005, 013 and 015
173-180-006



Relative Location

Project No.: 80.ECOSYS2.19

SITE LOCATION MAP
VACANT LAND
Granite Hill Drive & Pyrite Street
Riverside CA 92509

EnviroApplications, Inc.
Engineering & Consulting

2831 Camino Del Rio South
Suite 214, Mission Valley
San Diego, CA 92108-3828

Date: 8-21-2019	Source: USGS, Riverside, West (2012)	Scale: 1" = 2,500'	FIGURE 1
Client: Ecosystem Investment Partners	By: Bernard Sentianin, PG		Revision: 1

Project No.: 80.ECOSYS2.19

SAMPLE LOCATION MAP
VACANT LAND
Granite Hill Drive & Pyrite Street
Riverside CA 92509

EnviroApplications, Inc.
Engineering & Consulting
2831 Camino Del Rio South
Suite 214, Mission Valley
San Diego, CA 92108-3828

Date: 8-21-2019	Source: GoogleEarth (2018)	Scale: 1" = 500'	FIGURE 3

Client: Ecosystem Investment Partners

By: Bernard Sentianin, PG

Revision: 1

ATTACHMENT 1

PHOTOGRAPHS OF THE SUBJECT & ADJACENT PROPERTIES

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

Promenade At Glen Avon Property
North & South Sides of State Route 60
East of The Pyrite Street Exit, Jurupa Valley
(North) Riverside County, CA 92509

August 27, 2019

EAI Project No.: 80.ECOSYS1.19

APNs: 171-020-001, 004, 015, 027, 028 and 030
171-030-001, 004, 005, 013 and 015
173-180-006

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 1 of 20

View looking west across portion of subject property between Granite Hill Drive and Highway 60.

Photograph No. 2 of 20

View of Monitoring Well box labaled MW-7B, located adjacent to Granite Hill Drive.

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 3 of 20

View looking north from Granite Hill Drive across northern portion of subject property.

Photograph No. 4 of 20

View looking southwest across northern portion of subject property.

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 5 of 20

Looking northeast across northern magin of subject property.

Photograph No. 6 of 20

Looking north at adjacent property (auto salvage lot).

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 7 of 20

Looking west at remediation compound for Stringfellow Acid Pits site.

Photograph No. 8 of 20

Looking south across northern poriton of subject property at concrete-filled steel casing set in a concrete pad).

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 9 of 20

Looking west across northern portion of subject property.

Photograph No. 10 of 20

Looking west across southern portion of subject property.

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 11 of 20

Looking east from Pyrite Street across southern poriton of subject property.

Photograph No. 12 of 20

Looking south along Pyrite Street across southern portion of subject property.

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 13 of 20

Looking south across southern portion subject property. Several monitoring wells are present in the foreground.

Photograph No. 14 of 20

Looking southwest at monitoring well (unlabeled) in southern portion of subject property.

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 15 of 20

Looking south along concrete drainage channel in southern portion of subject property.

Photograph No. 16 of 20

Looking southwest across southern portion of subject property. Numerous tires and trash were noted.

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 17 of 20

Looking south at burned van and debris in abandoned encampment in northeast corner of subject property.

Photograph No. 18 of 20

Looking west along Mission Boulevard across southern portion of subject property.

ENVIROAPPLICATIONS, INC.
PHOTOGRAPHIC RECORD

Client:	Ecosystem Investment Partners	**Job Number:**	80.ECOSYS1.19
Subject Name:	Promenade at Glen Avon	**Location:**	Pyrite Street & Granite Hill Drive, Riverside, California
Photographer:	Bernard Sentianin	**Date:**	August 8, 2019

Photograph No. 19 of 20

Looking west toward Pyrite Street in southern portion of subject property (note several monitoring wells in this area).

Photograph No. 20 of 20

Looking southwest toward intersection of Pyrite Street and Misson Boulevard. Two gas stations were noted there.

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

PROMENADE AT GLEN AVON
GRANITE HILL DR & PYRITE ST
RIVERSIDE, CA 92509

TARGET PROPERTY COORDINATES

Latitude (North):	34.018572 - 34° 1' 6.86''
Longitude (West):	117.458012 - 117° 27' 28.84''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	457711.7
UTM Y (Meters):	3764115.2
Elevation:	957 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5619058 FONTANA, CA
Version Date:	2012
South Map:	5641332 RIVERSIDE WEST, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

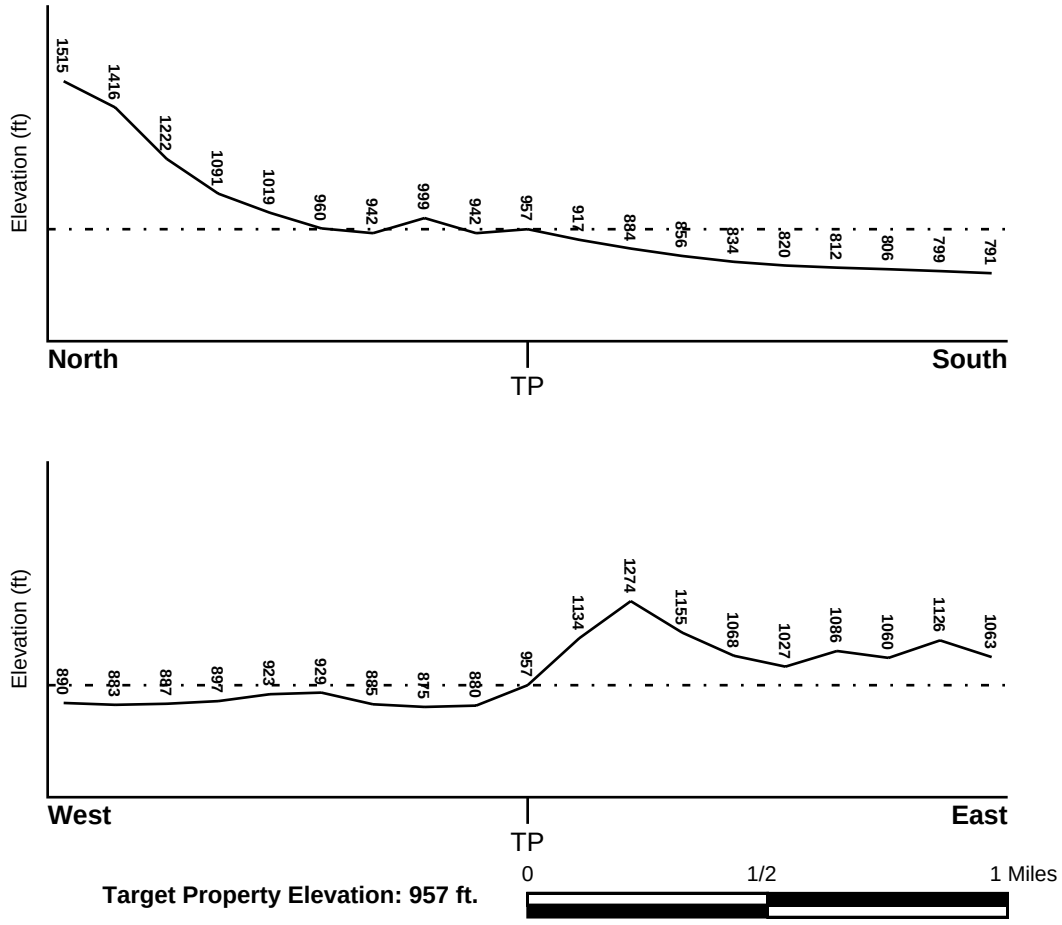
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General West

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 957 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06065C0039G	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06071C8665H	FEMA FIRM Flood data
06065C0038G	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
FONTANA	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
1	1/2 - 1 Mile SSW	S
1G	1/2 - 1 Mile SSW	S

For additional site information, refer to Physical Setting Source Map Findings.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

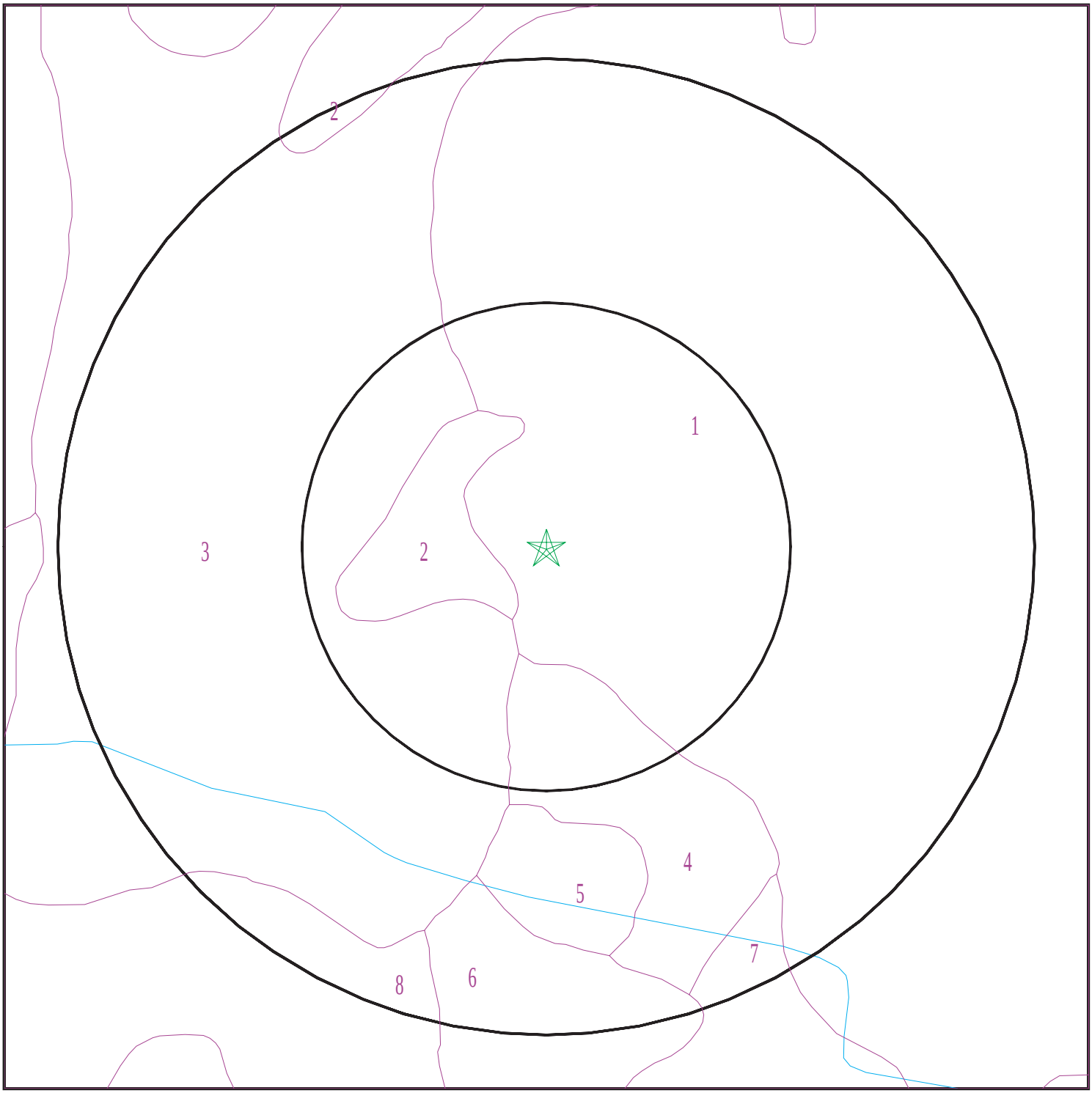
Era:	Paleozoic
System:	Pennsylvanian
Series:	Upper Paleozoic
Code:	uPze *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Eugeosynclinal Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 5730452.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Promenade At Glen Avon	CLIENT:	Enviroapplications Inc.
ADDRESS:	Granite Hill Dr & Pyrite St Riverside CA 92509	CONTACT:	Fred Allee
LAT/LONG:	34.018572 / 117.458012	INQUIRY #:	5730452.2s
		DATE:	July 26, 2019 1:14 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Cieneba

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
2	14 inches	22 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 2

Soil Component Name: MADERA

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Moderately well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.4
2	14 inches	20 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.4
3	20 inches	31 inches	indurated	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.4
4	31 inches	59 inches	stratified coarse sandy loam to clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.4

Soil Map ID: 3

Soil Component Name: DELHI

Soil Surface Texture: fine sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Somewhat excessively drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	fine sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 6.1
2	9 inches	48 inches	sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 6.1
3	48 inches	59 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 6.1

Soil Map ID: 4

Soil Component Name: HANFORD

Soil Surface Texture: coarse sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Somewhat excessively drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.6
2	7 inches	40 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.6
3	40 inches	59 inches	stratified loamy sand to coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.6

Soil Map ID: 5

Soil Component Name: CIENEBA

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
2	14 inches	22 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 6

Soil Component Name: RAMONA

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	7 inches	16 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6
3	16 inches	68 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6
4	68 inches	74 inches	gravelly sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Map ID: 7

Soil Component Name: VISTA

Soil Surface Texture: coarse sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
2	14 inches	24 inches	coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	24 inches	27 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 8

Soil Component Name: HANFORD

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.6
2	7 inches	40 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.6
3	40 inches	59 inches	stratified loamy sand to coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

No PWS System Found

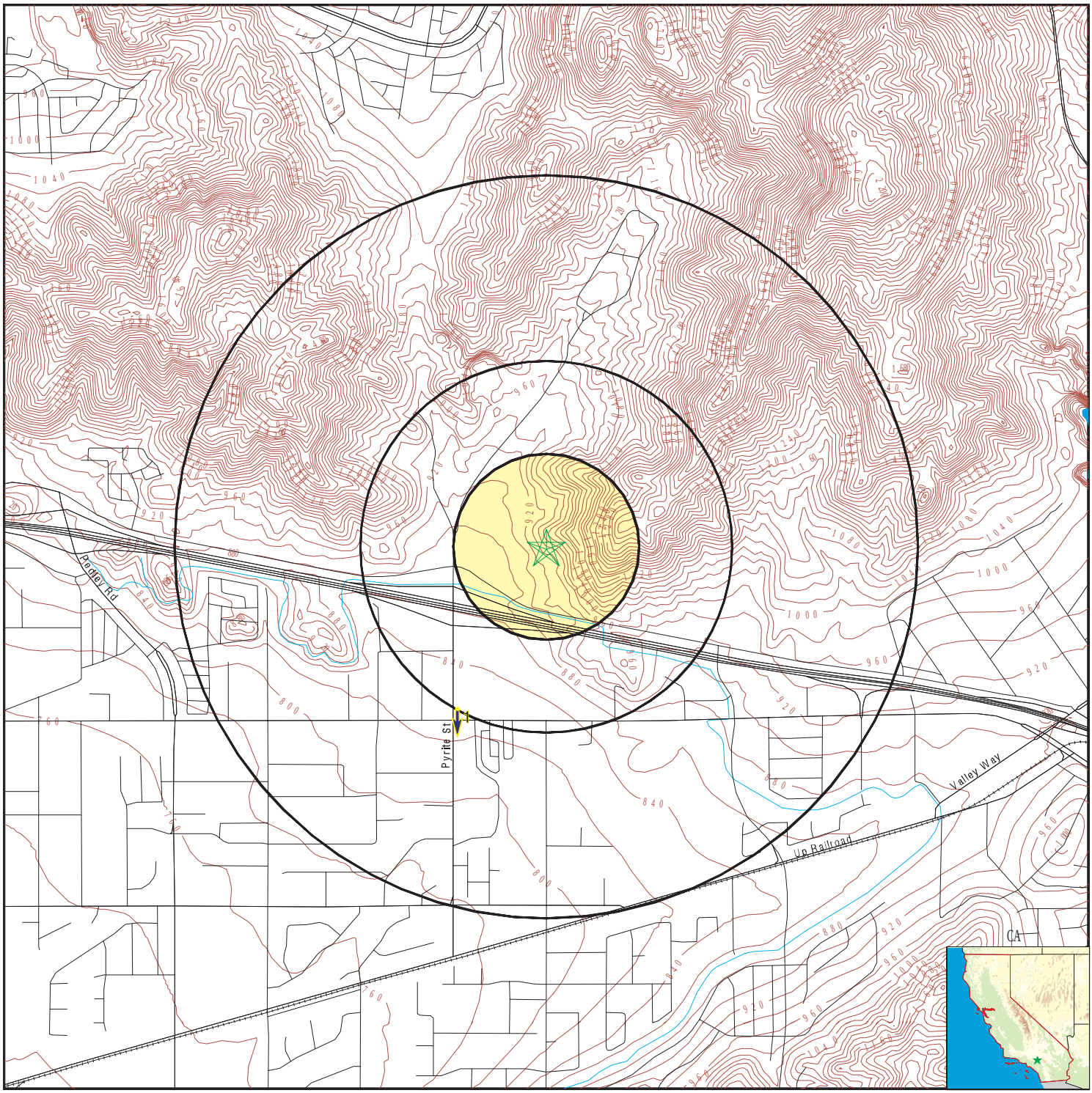
Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

No Wells Found

PHYSICAL SETTING SOURCE MAP - 5730452.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Promenade At Glen Avon	CLIENT:	Enviroapplications Inc.
ADDRESS:	Granite Hill Dr & Pyrite St Riverside CA 92509	CONTACT:	Fred Allee
		INQUIRY #:	5730452.2s
LAT/LONG:	34.018572 / 117.458012	DATE:	July 26, 2019 1:14 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
1 **SSW** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083303194T S 40 50 Not Reported 09/03/1998	**AQUIFLOW**	**37865**
1G **SSW** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083303194T S 40 50 Not Reported 09/03/1998	**AQUIFLOW**	**37865**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92509	12	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 92509

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.900 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

ATTACHMENT 4

DATABASE ASSESSMENT CRITIERA

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

Promenade At Glen Avon Property
North & South Sides of State Route 60
East of The Pyrite Street Exit, Jurupa Valley
(North) Riverside County, CA 92509

August 27, 2019

EAI Project No.: 80.ECOSYS1.19

APNs: 171-020-001, 004, 015, 027, 028 and 030
171-030-001, 004, 005, 013 and 015
173-180-006

DATABASE ASSESSMENT CRITERIA

EnviroApplications, Inc. (*EAI*) used a commercial government database search service in the preparation of this report. Specifically, research into environmental regulatory agency database listings was performed by a third-party database search firm. The purpose of the review was to identify reported environmental issues for the subject property (SP) and other properties in the vicinity. The database search firm utilized the more stringent of the approximate minimum search distances specified in the Scope of Work described in Section 1.4 for each of the referenced Local, State and Federal environmental agency and other databases. The definition of the databases searched and the associated search radius distances from the SP are identified in the regulatory agency database search report.

The regulatory agency database search report commonly lists a number of sites identified as "unmappable and/or orphan." The database search firm was unable to confirm the physical locations of these sites relative to the SP or to assess whether they were located within the designated search radii. *EAI* independently reviewed the locations of these "unmappable" sites, to the extent possible, using various maps and our knowledge of the SP area. Any of the "unmappable" sites determined to be within the designated search radii were included in our evaluation of the various listed release sites that might result in a potential ASTM *recognized environmental condition* (REC) of the SP.

An ASTM REC refers to the presence or likely presence of any hazardous substances or petroleum products in, on, or at the SP: due to release into the environment; under conditions indicative of a release into the environment; or under conditions that pose a material threat of a future release into the environment.

An ASTM *controlled recognized environmental condition (CREC)* refers to a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory agency authorities, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

An ASTM *historical recognized environmental condition (HREC)* refers to a past release of any hazardous substances or petroleum products that has occurred in connection with the SP and has been addressed to the satisfaction of the applicable regulatory agency authorities, or meeting unrestricted use criteria established by a regulatory authority, without subjecting the SP or its improvements to any required engineering or other types of controls.

EAI reviewed the results of the database search report to note reported environmental release sites in the vicinity of the SP that were considered to have a potential to have adversely impacted the SP (i.e., are known to have or are expected to result in an ASTM REC). Reported release sites identified in the regulatory agency database search report were evaluated with respect to the nature and extent of a given release, the distance of the reported release site from the SP, the stratigraphy of soils, the expected soil permeability, and the topographic position of a reported release site with respect to known or expected local and/or regional groundwater movement direction. Those release sites that were considered likely to have impacted the SP are identified in the report as ASTM RECs, as defined in the latest version of ASTM Standard 1527. Sites that were listed in the database search report, but not identified as a release site (for example, a site listed as a hazardous waste generator but not as having had a release), and release sites that were listed as being "closed" by the regulatory agencies were not considered likely to have impacted the SP.

ATTACHMENT 5

AGENCY RECORD REQUESTS AND INFORMATION RESPONSES

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

Promenade At Glen Avon Property
North & South Sides of State Route 60
East of The Pyrite Street Exit, Jurupa Valley
(North) Riverside County, CA 92509

August 27, 2019

EAI Project No.: 80.ECOSYS1.19

APNs: 171-020-001, 004, 015, 027, 028 and 030
171-030-001, 004, 005, 013 and 015
173-180-006

Jared Blumenfeld
Secretary for
Environmental Protection

Department of Toxic Substances Control

Meredith Williams, Acting Director
5796 Corporate Avenue
Cypress, California 90630

Gavin Newsom
Governor

August 21, 2019

Mr. Fred Allee
EnviroApplications, Inc.
Mission Valley, SD
fallee@enviroapplications.com

Site: Proposed Promenade At Glen Avon, Jurupa Valley, Riverside County, CA 92509
APNs: 171-020-001, 004, 015, 027, 028 and 030; 171-030-001, 004, 005, 013 and 015; and 173-180-006-00

PR4-072632-06

Dear: Mr. Allee:

We have received your Public Records Act Request dated July 24, 2019, for records from the Department of Toxic Substances Control.

After a thorough review of our files we have found that, no such records exist at this office pertaining to the site/facilities/parcels referenced above.

We would like to inform you about Envirostor, a database that provides information and documents on over 5,000 DTSC cleanup sites including the Stringfellow NPL Site. Envirostor can be accessed at: http://www.envirostor.dtsc.ca.gov/public.

Cypress is excited to announce the creation of Cypress regional file room email box. Please begin using our email box to request records. These boxes will also allow other regions to provide support regarding PRARs when needed. Please let me know if you have any questions or concerns. All future PRARs (Public Records Act Requests) are to be emailed to:
CypressFileRoom@dtsc.ca.gov
and if needed, please continue to fax all requests to 714-484-5318.

If you have any questions, would like further information regarding your request, please contact our Regional Records Coordinator at (714) 484-5336

Sincerely,

Jone Barrio

Jone Barrio
Regional Records Coordinator
DTSC-Cypress Administrative Services

Fred Allee

To: WB-RB8-FileReview8
Subject: RE: SARWQCB Public Records Request - Thank You!

I appreciate your checking that address to make sure. Blessings, Fred

---

From: WB-RB8-FileReview8 <FileReview8@waterboards.ca.gov>
Sent: Monday, August 19, 2019 10:20 AM
To: Fred Allee <fallee@enviroapplications.com>
Subject: RE: SARWQCB Public Records Request – Promenade at Glen Avon, Riverside County, CA 92509

Good afternoon,

After careful review of our records, we show we have no files for the following site:

Promenade at Glen Avon, Riverside County, CA 92509

Additionally, we do not maintain our files using APN numbers or cross streets. We only use facility names and/or physical address numbers to locate files.

If we can be of further assistance please do not hesitate to contact us again.

File Review Desk

From: Fred Allee [mailto:fallee@enviroapplications.com]
Sent: Wednesday, July 24, 2019 10:11 AM
To: WB-RB8-FileReview8 <FileReview8@waterboards.ca.gov>
Cc:
Subject: SARWQCB Public Records Request – Promenade at Glen Avon, Riverside County, CA 92509

Hi Mary, hope you are doing well. We have just been asked to do an environmental assessment of a vacant property in Jurupa Valley, Riverside:

Promenade at Glen Avon, Riverside County, CA 92509
(APNs: 171-020-001, 004, 015, 027, 028 and 030; 171-030-001, 004, 005, 013 and 015; and 173-180-006-00).

I would appreciate it if you could check to see if there are any SARWQCB records associated with this name and/or parcels? I searched GeoTracker and could not find anything but wanted to check with you to make sure.

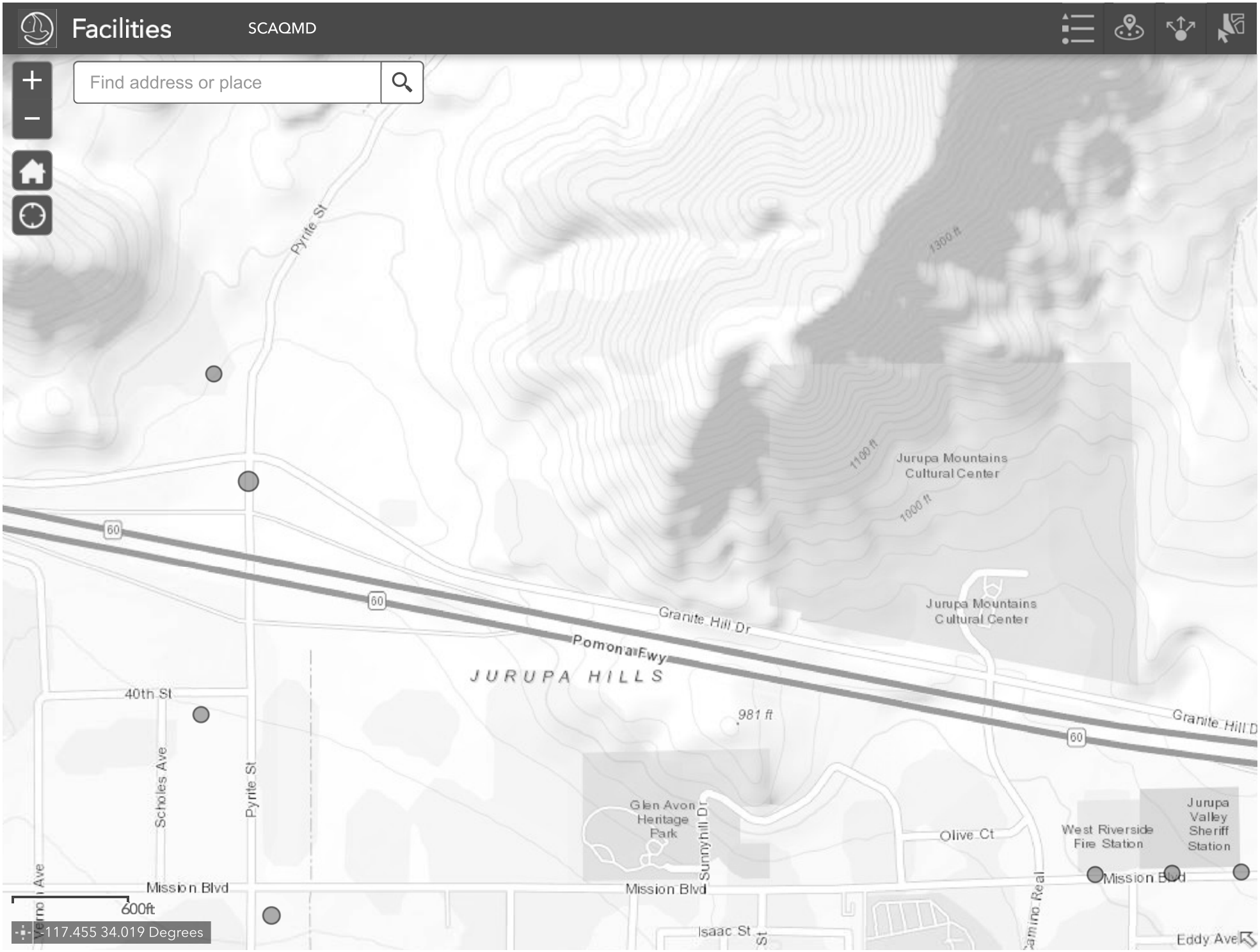
Thank you,

Fred Allee
Senior Chemical/Environmental Engineer
EnviroApplications, Inc.
Rio Sur Office Complex, Mission Valley
2831 Camino Del Rio South, Suite 214

mobile: 619.347.2761
office: 619.291.3636
fax: 619.291.3639

Please consider the impact on the environment before printing this message.
To care for the earth is Biblical, as it is to care for ourselves, each other and
care about those who come after us.

Save the Earth....it's the only known planet with chocolate!


Facilities
SCAQMD
Find address or place
Pyrite St
1300 ft
1100 ft
1000 ft
Jurupa Mountains Cultural Center
60
Granite Hill Dr
Pomona Fwy
JURUPA HILLS
981 ft
40th St
Scholes Ave
Pyrite St
Glen Avon Heritage Park
Sunnyhill Dr
Olive Ct
West Riverside Fire Station
Jurupa Valley Sheriff Station
Mission Blvd
Isaac St
Eddy Ave
600ft
-117.455 34.019 Degrees

ATTACHMENT 6

HISTORICAL INFORMATION REGARDING THE SUBJECT PROPERTY

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

Promenade At Glen Avon Property
North & South Sides of State Route 60
East of The Pyrite Street Exit, Jurupa Valley
(North) Riverside County, CA 92509

August 27, 2019

EAI Project No.: 80.ECOSYS1.19

APNs: 171-020-001, 004, 015, 027, 028 and 030
171-030-001, 004, 005, 013 and 015
173-180-006

Promenade At Glen Avon

Granite Hill Dr & Pyrite St

Riverside, CA 92509

Inquiry Number: 5730452.8

July 26, 2019

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

07/26/19

Site Name:

Promenade At Glen Avon
Granite Hill Dr & Pyrite St
Riverside, CA 92509
EDR Inquiry # 5730452.8

Client Name:

Enviroapplications Inc.
2831 Camino Del Rio South
San Diego, CA 92108
Contact: Fred Allee

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1994	1"=500'	Acquisition Date: June 01, 1994	USGS/DOQQ
1990	1"=500'	Flight Date: September 06, 1990	USDA
1985	1"=500'	Flight Date: September 13, 1985	USDA
1975	1"=500'	Flight Date: August 01, 1975	USGS
1967	1"=500'	Flight Date: May 15, 1967	USDA
1959	1"=500'	Flight Date: October 15, 1959	USDA
1953	1"=500'	Flight Date: September 22, 1953	USDA
1948	1"=500'	Flight Date: July 10, 1948	USGS
1938	1"=500'	Flight Date: June 03, 1938	USDA
1931	1"=500'	Flight Date: September 18, 1931	FAIR

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.


INQUIRY #: 5730452.8
YEAR: 2016
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 2012
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 2009
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 2006
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1994
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1990
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1985
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1975
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1967
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1959
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1953
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1948
= 500'
N
EDR


INQUIRY #: 5730452.8
YEAR: 1938
= 500'
N
EDR

INQUIRY #: 5730452.8

YEAR: 1931

= 500'

N

EDR

Promenade At Glen Avon

Granite Hill Dr & Pyrite St

Riverside, CA 92509

Inquiry Number: 5730452.3

July 26, 2019

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

07/26/19

Site Name:

Promenade At Glen Avon
Granite Hill Dr & Pyrite St
Riverside, CA 92509
EDR Inquiry # 5730452.3

Client Name:

Enviroapplications Inc.
2831 Camino Del Rio South
San Diego, CA 92108
Contact: Fred Allee

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Enviroapplications Inc. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 517E-4C54-AE7A

PO # 01.ECOSYS1.19.02.0

Project Promenade At Glen Avon

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 517E-4C54-AE7A

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

Enviroapplications Inc. (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

Promenade At Glen Avon
Granite Hill Dr & Pyrite St
Riverside, CA 92509

Inquiry Number: 5730452.5
July 26, 2019

The EDR-City Directory Abstract

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals.

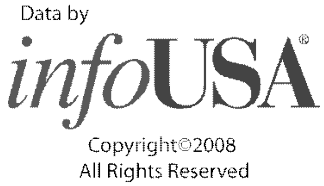
Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1921 through 2014. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 660 feet of the target property.

A summary of the information obtained is provided in the text of this report.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

EDR is licensed to reproduce certain City Directory works by the copyright holders of those works. The purchaser of this EDR City Directory Report may include it in report(s) delivered to a customer. Reproduction of City Directories without permission of the publisher or licensed vendor may be a violation of copyright.



RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

Year	Source	TP	Adjoining	Text Abstract	Source Image
2014	EDR Digital Archive	-	-	-	-
2010	EDR Digital Archive	-	-	-	-
2005	EDR Digital Archive	-	-	-	-
2002	SBC PACIFIC BELL	-	X	X	-
2001	Haines & Company, Inc.	-	X	X	-
1996	Pacific Bell	-	X	X	-
1993	Pacific Bell	-	X	X	-
1990	Pacific Bell	-	X	X	-
1986	Pacific Bell Yellow Pages	-	X	X	-
1981	Pacific Telephone	-	-	-	-
1977	Pacific Telephone	-	-	-	-
1970	Pacific Telephone	-	-	-	-

EXECUTIVE SUMMARY

Year	Source	TP	Adjoining	Text Abstract	Source Image
1967	Luskey Brothers & Co.	-	-	-	-
1966	Luskey Brothers & Company Inc.	-	-	-	-
1961	Luskey Brothers & Co.	-	-	-	-
1960	Luskeys Brothers & Co., Publishers	-	-	-	-
1956	Luskey Brothers & Co.	-	-	-	-
1955	Luskeys Brothers & Co., Publishers	-	X	X	-
1951	Los Angeles Directory Co.	-	-	-	-
1946	Southern California Telephone Company	-	-	-	-
1945	Los Angeles Directory Co.	-	-	-	-
1941	Pacific Directory Co.	-	-	-	-
1939	Los Angeles Directory Co.	-	-	-	-
1936	Los Angeles Directory Co.	-	-	-	-
1931	Southern California Telephone Co.	-	-	-	-
1930	Los Angeles Directory Co.	-	-	-	-
1927	Los Angeles Directory Co.	-	-	-	-
1925	Los Angeles Directory Co.	-	-	-	-
1924	Kaasen Directory Co.	-	-	-	-
1921	Riverside Directory Co.	-	-	-	-

FINDINGS

TARGET PROPERTY INFORMATION

ADDRESS

Granite Hill Dr & Pyrite St
Riverside, CA 92509

FINDINGS DETAIL

Target Property research detail.

FINDINGS

ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

PYRITE

3851 PYRITE

Year	Uses	Source
2002	A RECONDITIONING FACTORY	SBC PACIFIC BELL

3873 PYRITE

Year	Uses	Source
2002	TEXACO	SBC PACIFIC BELL

PYRITE ST

3812 PYRITE ST

Year	Uses	Source
1955	Durette W J	Luskeys Brothers & Co., Publishers

3851 PYRITE ST

Year	Uses	Source
2001	AAPPLIANCE	Haines & Company, Inc.
	RECYCLING FACTORY A RECONDITIONING	Haines & Company, Inc.
	FACTORY APPLIANCE	Haines & Company, Inc.
	RECONDITIONING FCTY	Haines & Company, Inc.
	APPLIANCE	Haines & Company, Inc.
	RECYCLING CLARK WILLS RCYCLG	Haines & Company, Inc.
	WILLISCLARKAPLNC	Haines & Company, Inc.
	RECYCLINGA APPLOC	Haines & Company, Inc.
1996	Holmes Fred	Pacific Bell
	A APPLIANCE RECYCLING FACTORY	Pacific Bell
1993	A APPLIANCE RECYCLING FACTORY	Pacific Bell
1990	TLC RESTORATION	Pacific Bell
	Holmes Fred	Pacific Bell
	A APPLIANCE RECYCLING FACTORY	Pacific Bell
	TLC REFINISHING	Pacific Bell
1986	Appliance Recycling A Appliance Recycling Factory	Pacific Bell Yellow Pages
	Appiction Unl	Pacific Bell Yellow Pages

FINDINGS

Year	Uses	Source
1986	Clark Willis	Pacific Bell Yellow Pages
	Clarke Aden M & Barbara A	Pacific Bell Yellow Pages
	Clarke C	Pacific Bell Yellow Pages
	Recycling Factory	Pacific Bell Yellow Pages

3873 PYRITE ST

Year	Uses	Source
2001	TEXACO	Haines & Company, Inc.

FINDINGS

ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

Address Researched	Address Not Identified in Research Source
3812 PYRITE ST	2014, 2010, 2005, 2002, 2001, 1996, 1993, 1990, 1986, 1981, 1977, 1970, 1967, 1966, 1961, 1960, 1956, 1951, 1946, 1945, 1941, 1939, 1936, 1931, 1930, 1927, 1925, 1924, 1921
3851 PYRITE	2014, 2010, 2005, 2001, 1996, 1993, 1990, 1986, 1981, 1977, 1970, 1967, 1966, 1961, 1960, 1956, 1955, 1951, 1946, 1945, 1941, 1939, 1936, 1931, 1930, 1927, 1925, 1924, 1921
3851 PYRITE ST	2014, 2010, 2005, 2002, 1981, 1977, 1970, 1967, 1966, 1961, 1960, 1956, 1955, 1951, 1946, 1945, 1941, 1939, 1936, 1931, 1930, 1927, 1925, 1924, 1921
3873 PYRITE	2014, 2010, 2005, 2001, 1996, 1993, 1990, 1986, 1981, 1977, 1970, 1967, 1966, 1961, 1960, 1956, 1955, 1951, 1946, 1945, 1941, 1939, 1936, 1931, 1930, 1927, 1925, 1924, 1921
3873 PYRITE ST	2014, 2010, 2005, 2002, 1996, 1993, 1990, 1986, 1981, 1977, 1970, 1967, 1966, 1961, 1960, 1956, 1955, 1951, 1946, 1945, 1941, 1939, 1936, 1931, 1930, 1927, 1925, 1924, 1921

TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

Address Researched	Address Not Identified in Research Source
Granite Hill Dr & Pyrite St	2014, 2010, 2005, 2002, 2001, 1996, 1993, 1990, 1986, 1981, 1977, 1970, 1967, 1966, 1961, 1960, 1956, 1955, 1951, 1946, 1945, 1941, 1939, 1936, 1931, 1930, 1927, 1925, 1924, 1921

Promenade At Glen Avon

Granite Hill Dr & Pyrite St

Riverside, CA 92509

Inquiry Number: 5730452.4

July 26, 2019

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

07/26/19

Site Name:

Promenade At Glen Avon
Granite Hill Dr & Pyrite St
Riverside, CA 92509
EDR Inquiry # 5730452.4

Client Name:

Enviroapplications Inc.
2831 Camino Del Rio South
San Diego, CA 92108
Contact: Fred Allee

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Enviroapplications Inc. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.# 01.ECOSYS1.19.02.0

Project: Promenade At Glen Avon

Coordinates:

Latitude:	34.018572 34° 1' 7" North
Longitude:	-117.458012 -117° 27' 29" West
UTM Zone:	Zone 11 North
UTM X Meters:	457712.62
UTM Y Meters:	3764309.77
Elevation:	957.19' above sea level

Maps Provided:

2012	1901
1980	1898
1975	1896
1973	
1967	
1954	
1953	
1942, 1943	

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

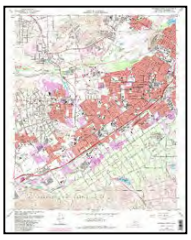
2012 Source Sheets

Riverside West
2012
7.5-minute, 24000

Fontana
2012
7.5-minute, 24000

1980 Source Sheets

Fontana
1980
7.5-minute, 24000
Aerial Photo Revised 1978

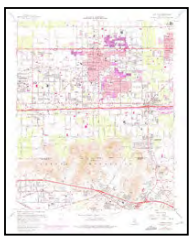


Riverside West
1980
7.5-minute, 24000
Aerial Photo Revised 1978

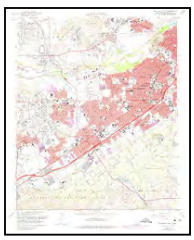
1975 Source Sheets

SAN BERNARDINO
1975
15-minute, 50000

1973 Source Sheets



Fontana
1973
7.5-minute, 24000
Aerial Photo Revised 1973

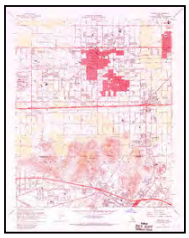


Riverside West
1973
7.5-minute, 24000
Aerial Photo Revised 1973

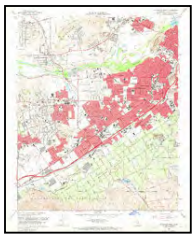
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1967 Source Sheets

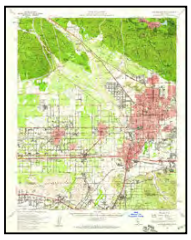


Fontana
1967
7.5-minute, 24000
Aerial Photo Revised 1966



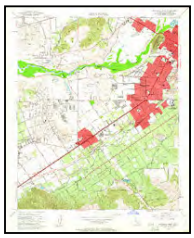
Riverside West
1967
7.5-minute, 24000
Aerial Photo Revised 1966

1954 Source Sheets

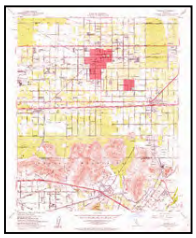


San Bernardino
1954
15-minute, 62500
Aerial Photo Revised 1952

1953 Source Sheets



Riverside West
1953
7.5-minute, 24000
Aerial Photo Revised 1951



Fontana
1953
7.5-minute, 24000
Aerial Photo Revised 1952

1942, 1943 Source Sheets

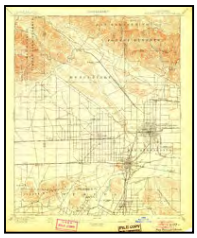
RIVERSIDE VICINITY
1942
7.5-minute, 31680

Fontana
1943
7.5-minute, 31680

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1901 Source Sheets



San Bernardino
1901
15-minute, 62500

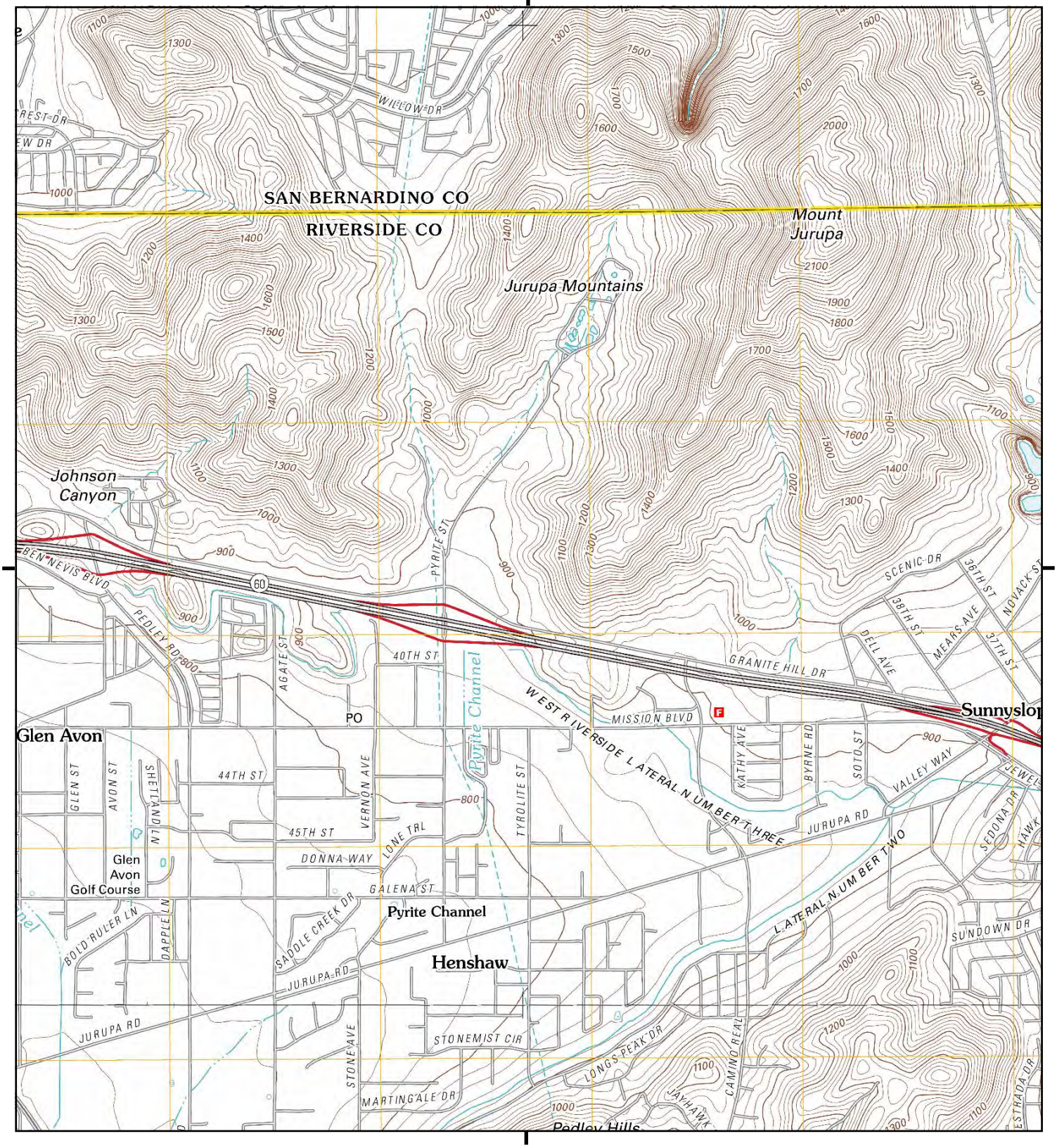
Riverside
1901
15-minute, 62500

1898 Source Sheets

San Bernardino
1898
15-minute, 62500

1896 Source Sheets

San Bernardino
1896
15-minute, 62500



This report includes information from the following map sheet(s).

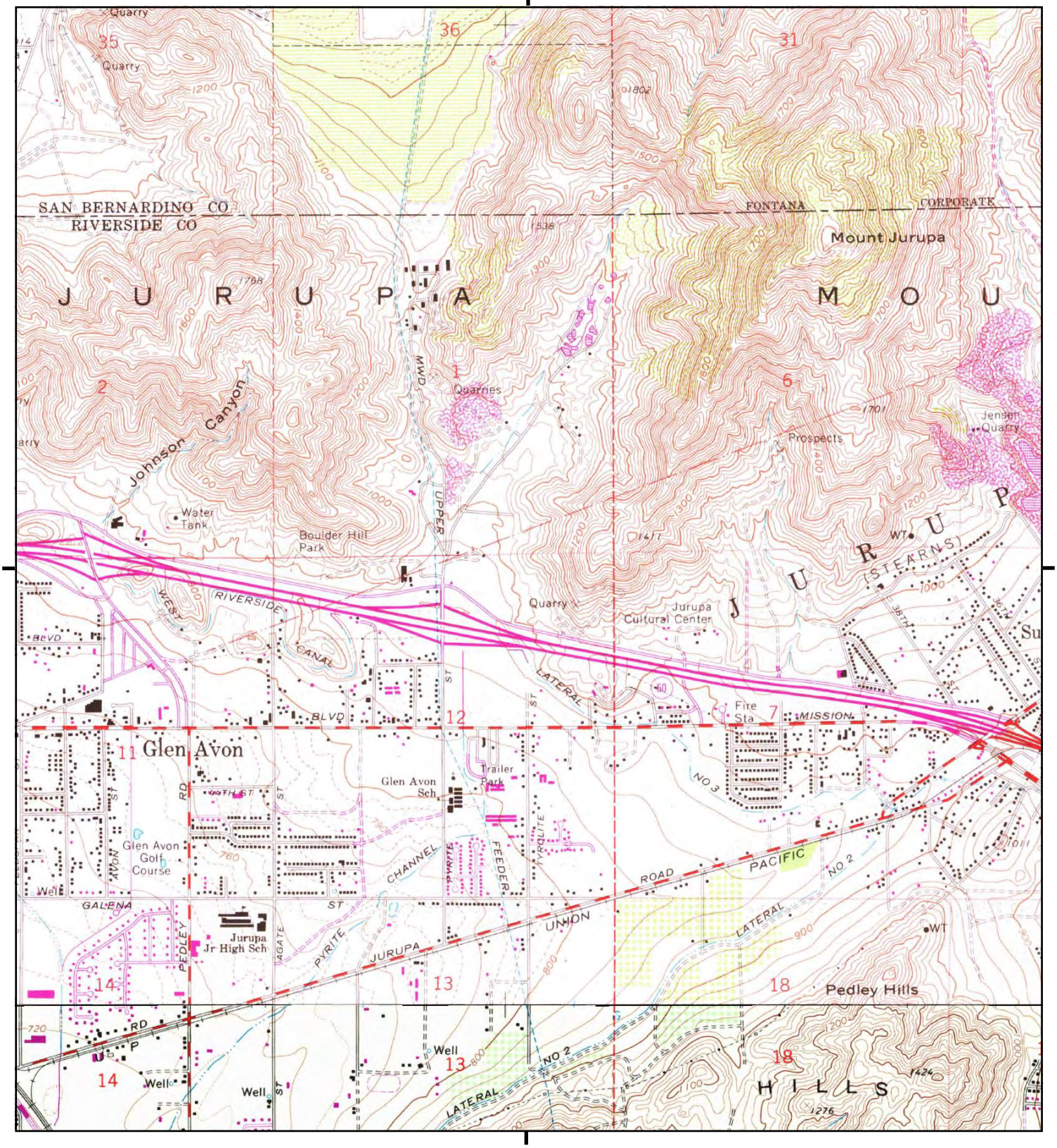
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Fontana, 2012, 7.5-minute
S, Riverside West, 2012, 7.5-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

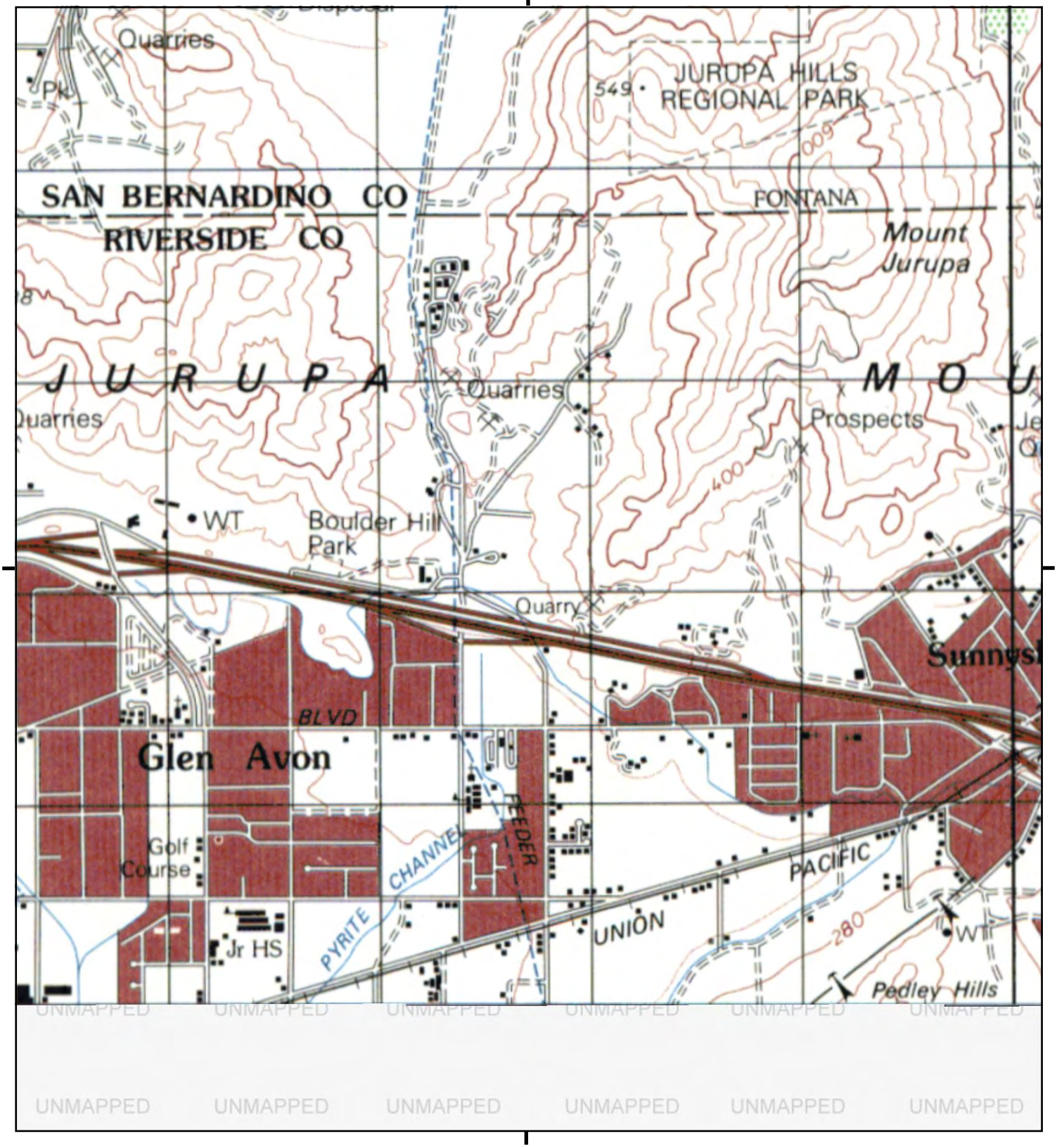
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Fontana, 1980, 7.5-minute
S, Riverside West, 1980, 7.5-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

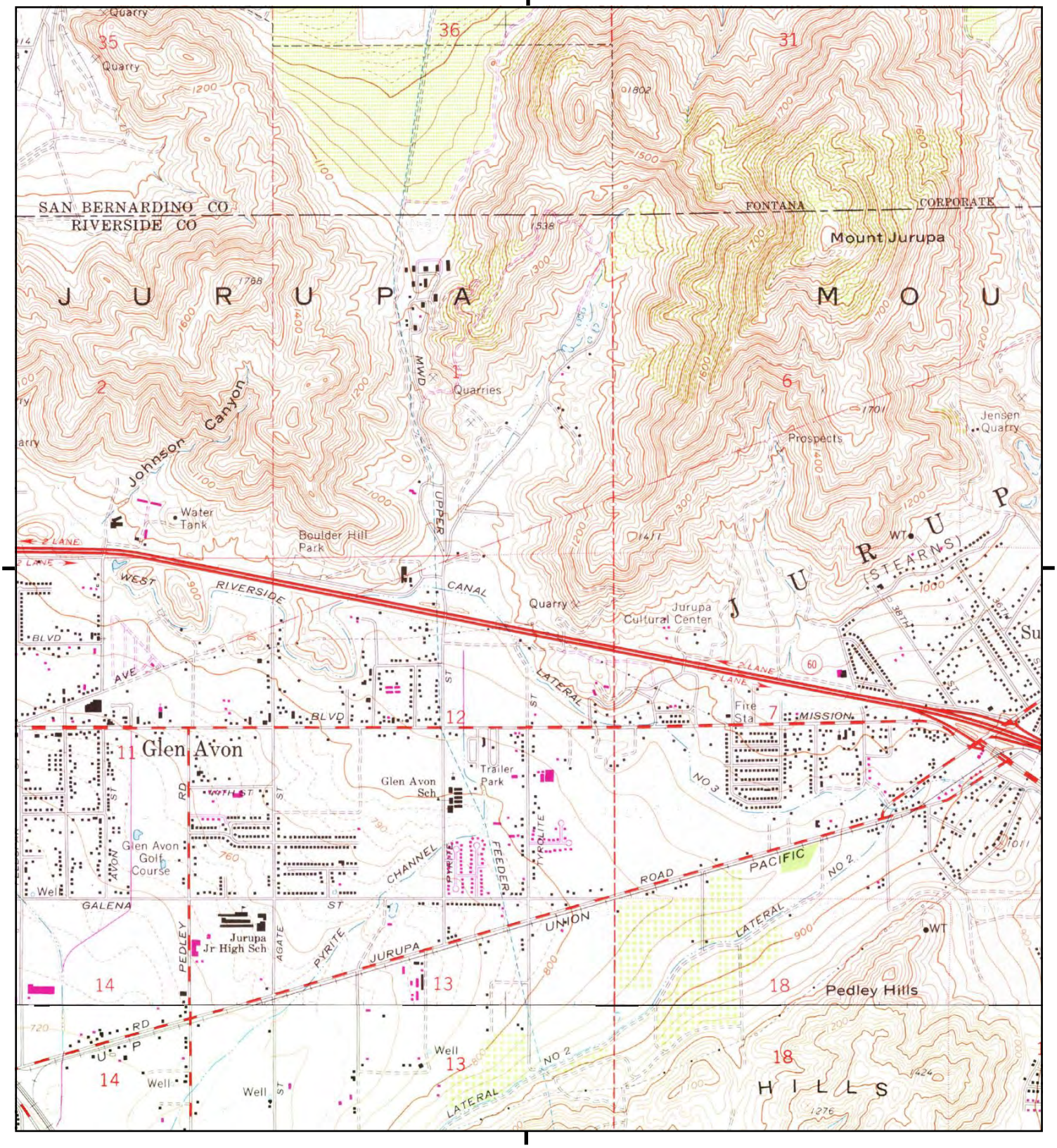
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, SAN BERNARDINO, 1975, 15-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

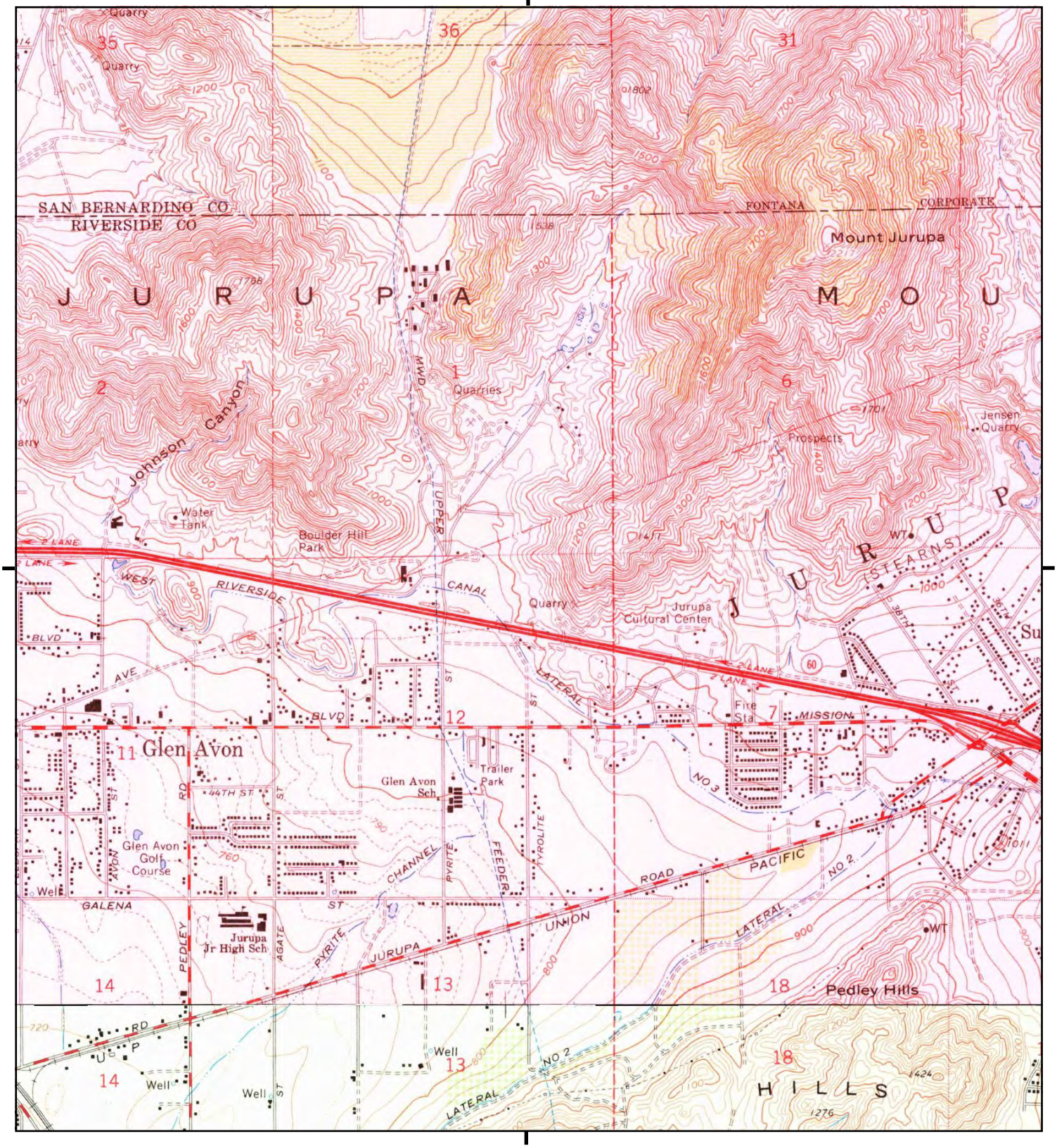
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Fontana, 1973, 7.5-minute
S, Riverside West, 1973, 7.5-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

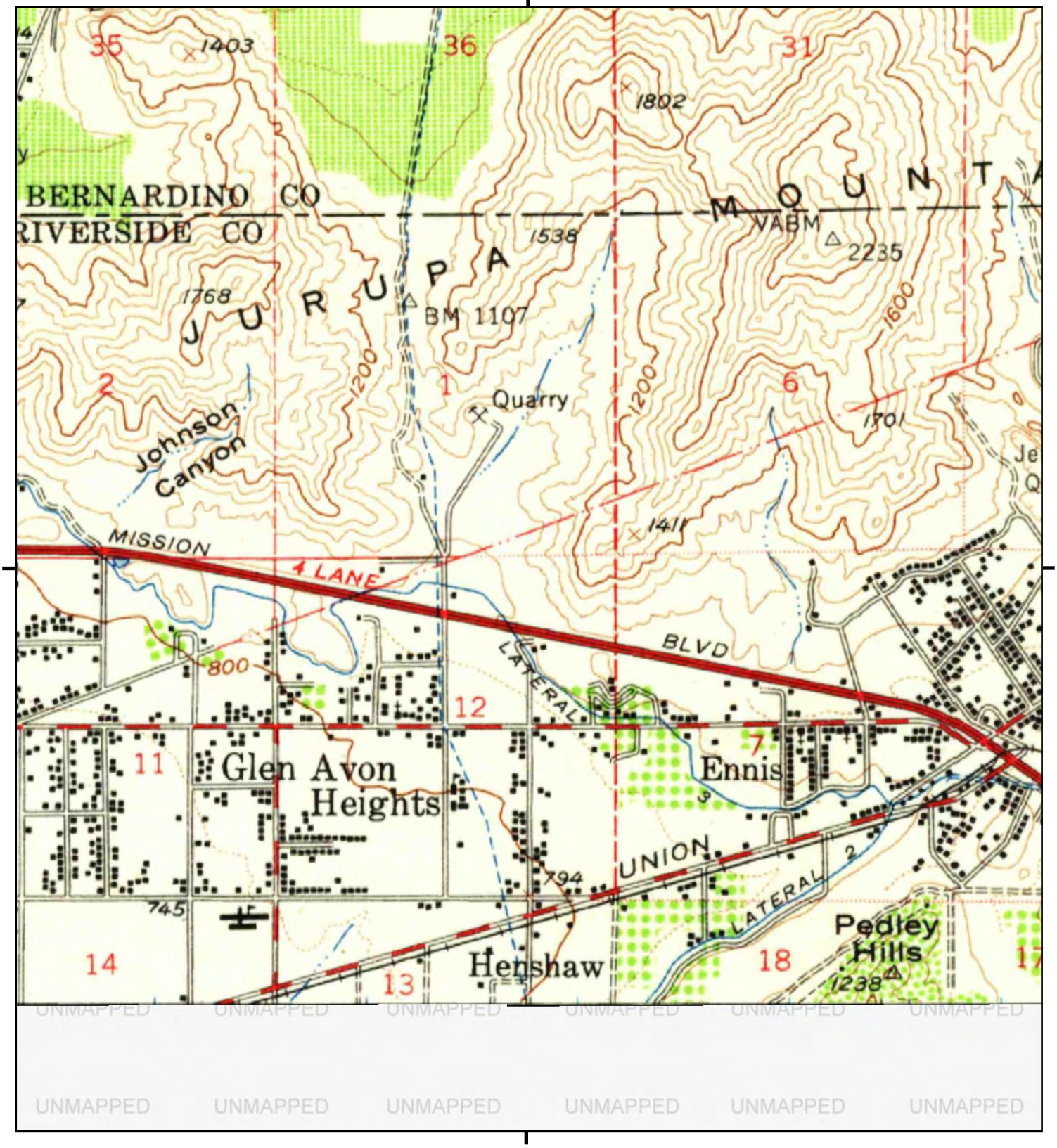
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Fontana, 1967, 7.5-minute
S, Riverside West, 1967, 7.5-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

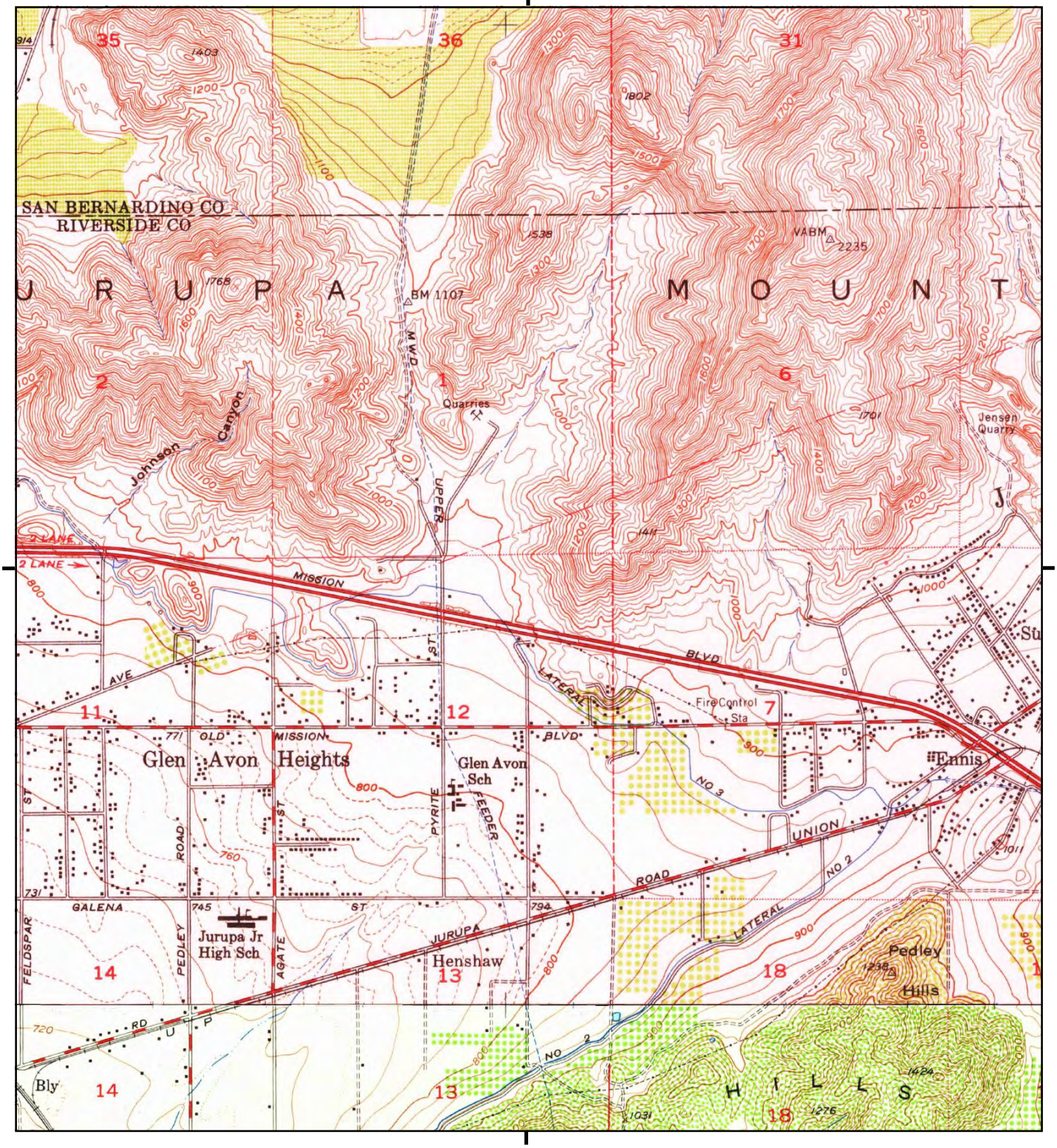
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, San Bernardino, 1954, 15-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

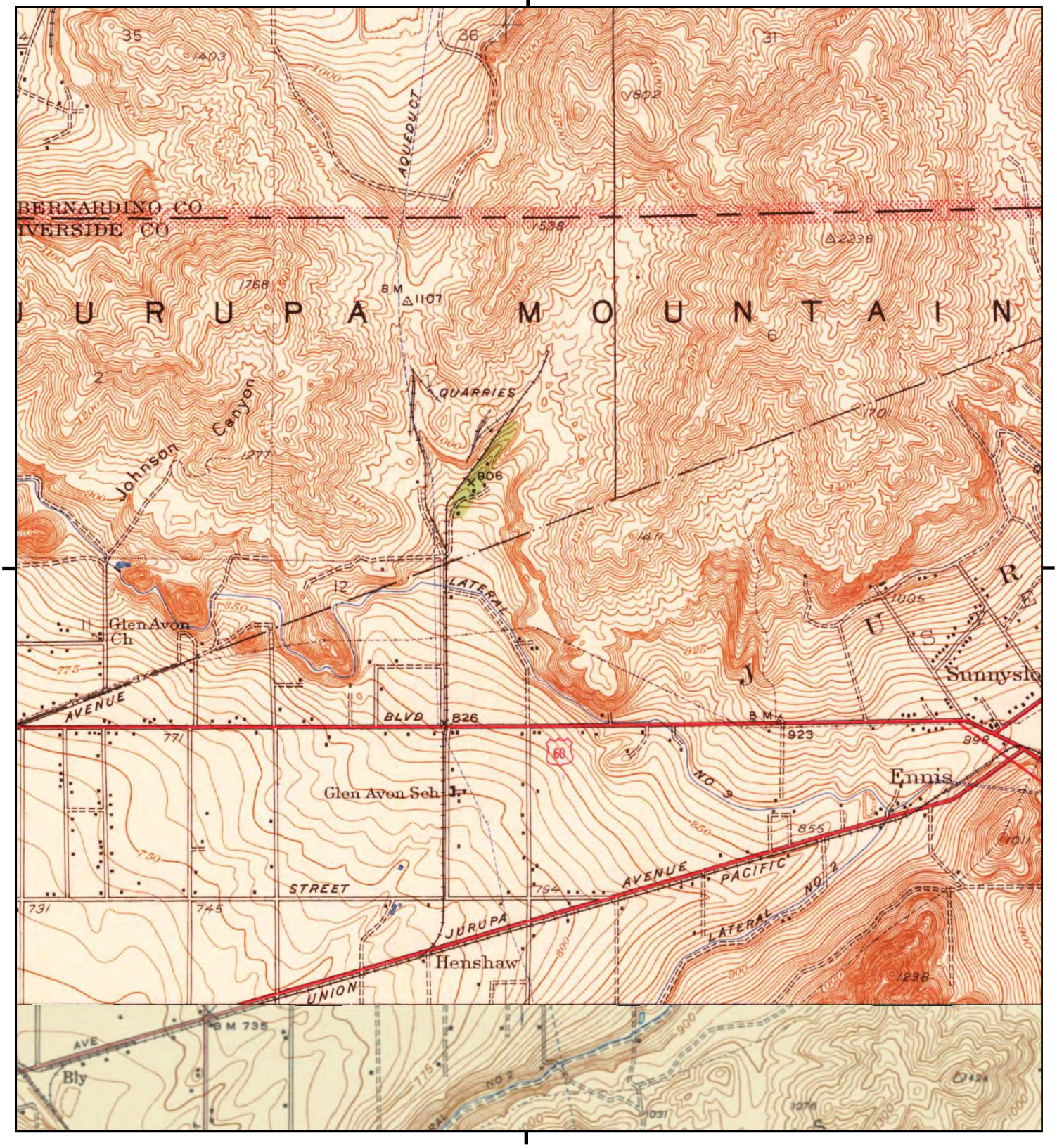
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Fontana, 1953, 7.5-minute
S, Riverside West, 1953, 7.5-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

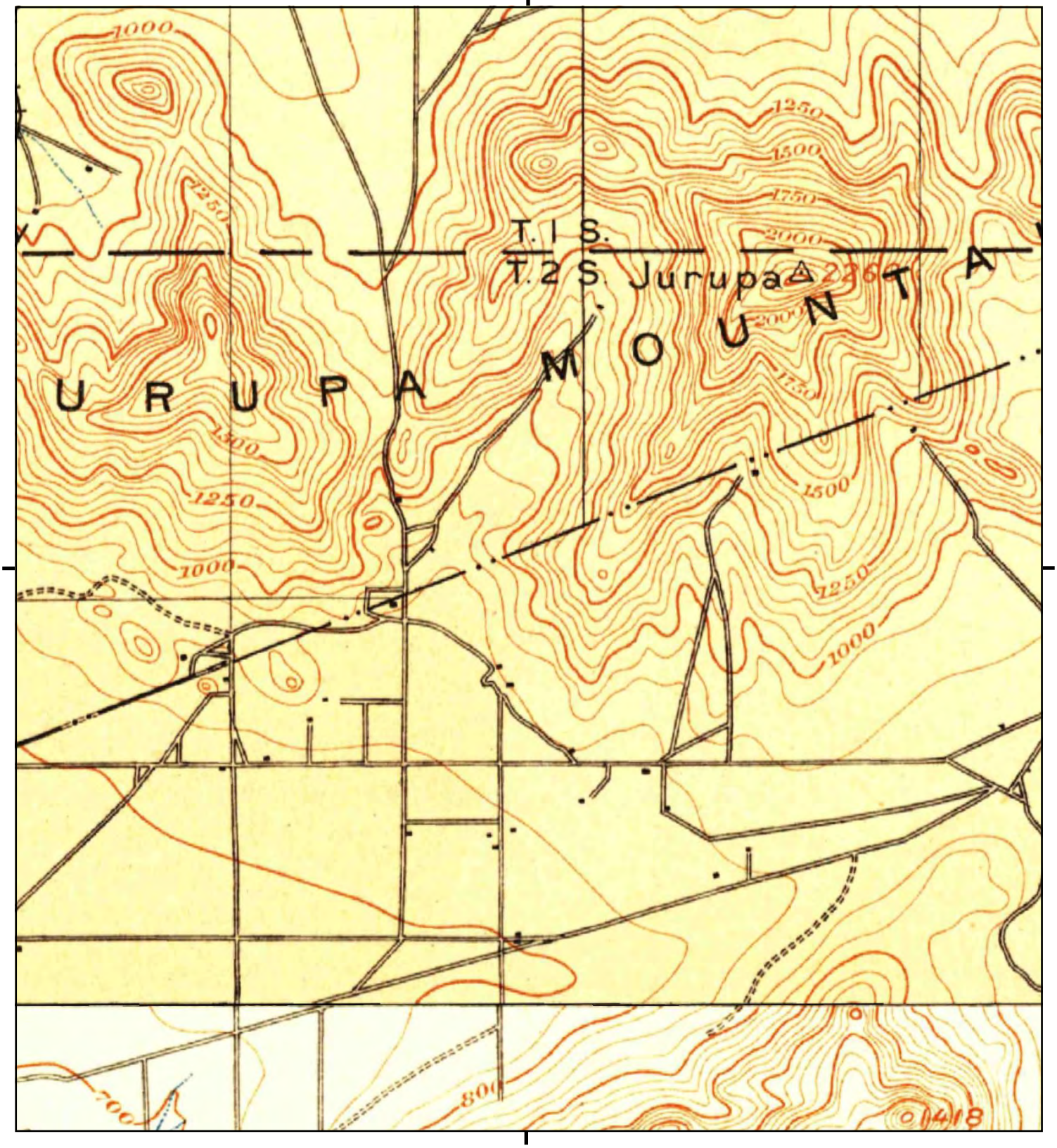
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Fontana, 1943, 7.5-minute
SE, RIVERSIDE VICINITY, 1942, 7.5-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

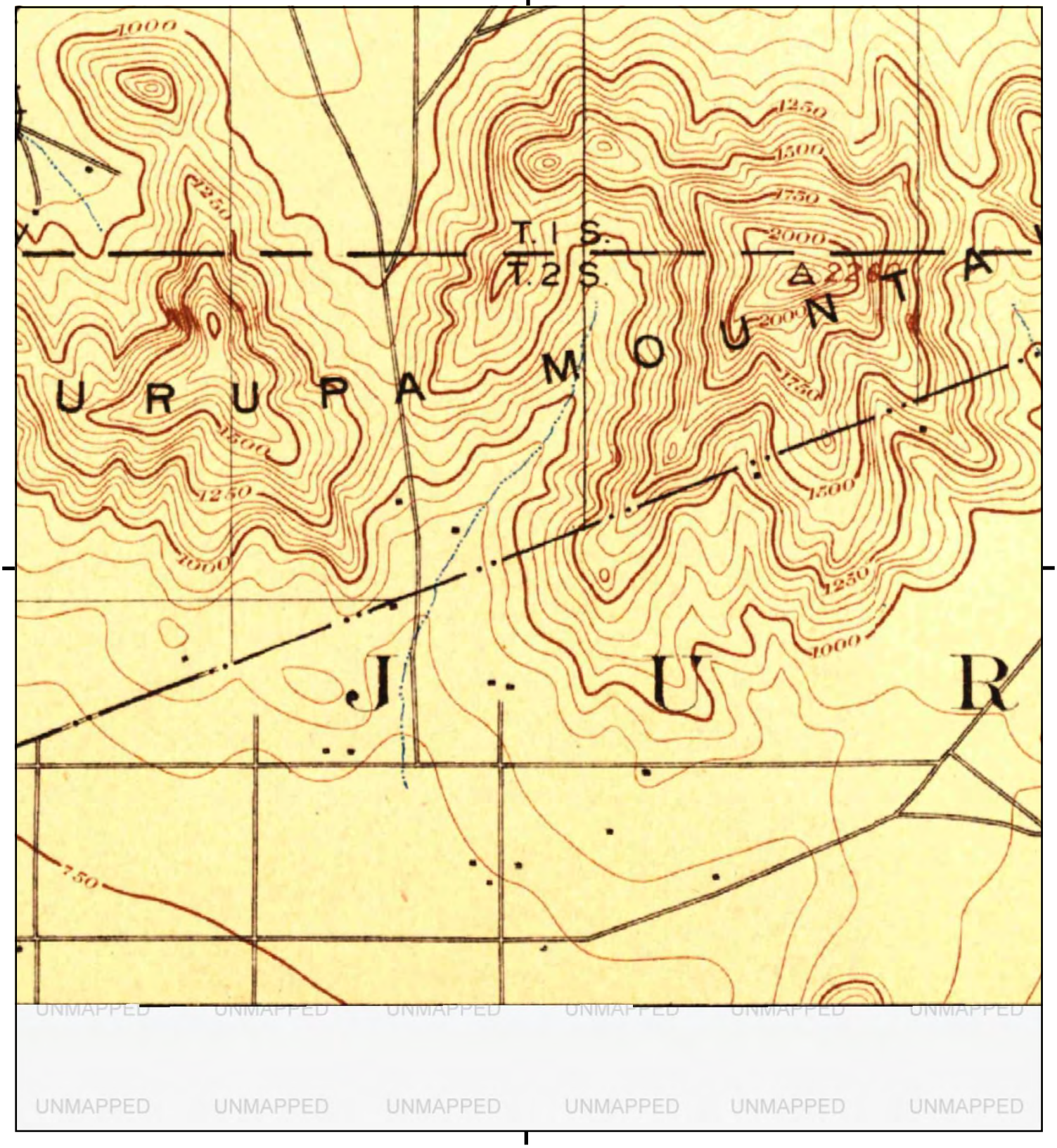
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, San Bernardino, 1901, 15-minute
SE, Riverside, 1901, 15-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

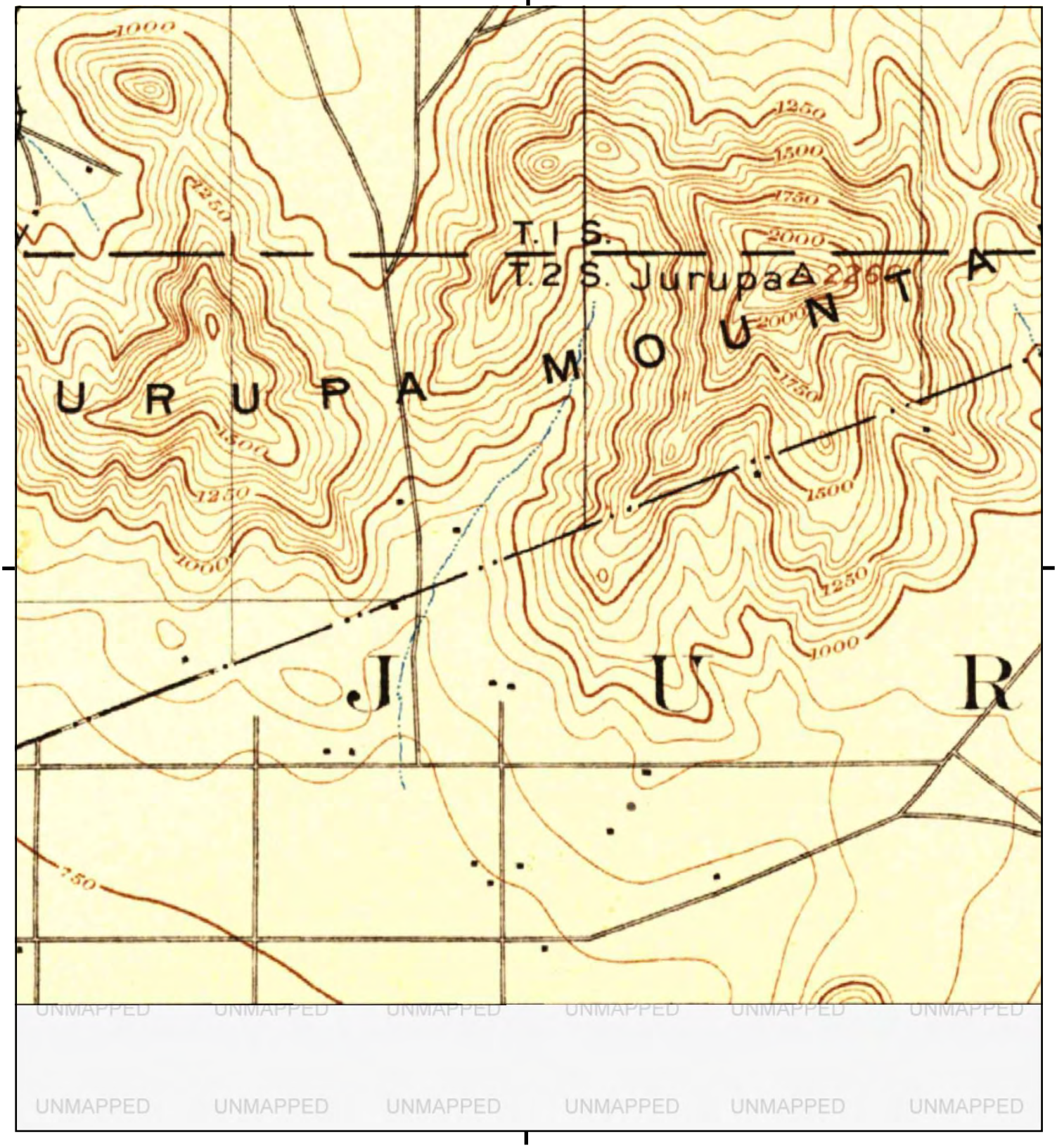
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, San Bernardino, 1898, 15-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, San Bernardino, 1896, 15-minute

SITE NAME: Promenade At Glen Avon
ADDRESS: Granite Hill Dr & Pyrite St
Riverside, CA 92509
CLIENT: Enviroapplications Inc.

N

ATTACHMENT 7

ENVIRONMENTAL PROFESSIONALS' QUALIFICATIONS

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

Promenade At Glen Avon Property
North & South Sides of State Route 60
East of The Pyrite Street Exit, Jurupa Valley
(North) Riverside County, CA 92509

August 27, 2019

EAI Project No.: 80.ECOSYS1.19

APNs: 171-020-001, 004, 015, 027, 028 and 030
171-030-001, 004, 005, 013 and 015
173-180-006

FREDERIC A. ALLEE, E.I.T.
Senior Chemical/Environmental Engineer, Project Manager, QA/QC Reviewer

B.S. Chemical Engineering (Minors: Musical Performance and Numerical Analysis), 1984
University of California, San Diego (UCSD)

Overall Expertise

Mr. Allee has more than 34 years of professional experience primarily in environmental consulting, vapor intrusion and human health risk assessment, hazardous materials and waste management; project management, and, environmental due diligence. This experience includes all aspects of projects dealing with the application of technologies to the assessment and mitigation of contaminated sites.

Early work following college included geotechnical consulting, landfill gas management and construction materials testing and inspection. As an Environmental Regulator/Project Manager with the County of San Diego, he conducted compliance inspections of industries using hazardous materials and generating hazardous wastes; participated on interagency enforcement action teams; reviewed and evaluated technical reports relating to the discovery, assessment, and remediation of sites contaminated with hazardous materials/wastes; and directed the investigation and remediation of sites contaminated with petroleum, solvents, pesticides, heavy metals, asbestos, and other hazardous wastes. He provided regulatory oversight during the assessment and cleanup of over 350 contaminated sites worth more than $350 million, and was responsible for the regulatory closure of more than 200 contaminated sites.

Later, as a Project Engineer he provided technical support for the Navy's Site Characterization and Analysis Penetrometer System (SCAPS), the EPA's Hazardous Waste Compliance Monitoring for Mexican/U.S. Customs and environmental inspectors' training program, the Navy's Comprehensive Long-term Environmental Action for Navy (CLEAN) program, the DOD's Unexploded Ordnance (UXO) contaminated land Advanced Technology Demonstration (ATD) program, the Naval Environmental Leadership Program (NELP), the EPA's Superfund Innovative Technologies Evaluation (SITE) program, and several U.S.-to-Mexico technology transfer projects under the EPA's RCRA Enforcement and Permitting Assistance (REPA) program including the start of Border XXI. Mr. Allee remains active along the border as a reviewer for Border 2012 (the next milestone of border XXI). A variety of projects for private-sector clients have included contaminated site closures for major oil companies, cities, municipal water districts, and several different types of commercial companies. He additionally served as the Site Safety Officer responsible for health and safety issues during approximately 25 projects. Mr. Allee has participated in projects involving asbestos assessment and abatement, where he supervised sampling and disposal activities. He assisted the County of San Diego U.S./Mexico Border Environmental Health Specialist during the period from 1989 to 1992 in his efforts to train local health department, customs, and environmental agency inspectors on both sides of the border. Because of his interest in trans-border affairs, Mr. Allee utilized off-work hours to assist the Chief Technical Advisor to (and Hazardous Material Instructor for) the Tijuana Mayor's Office of Disaster Preparedness, the Tijuana Fire and Police Departments, the Baja California Department of Ecology, the Baja California Secretariat of Environmental Health Services, and the Federal Secretariat of Environmental Affairs. Mr. Allee has guest lectured for environmental science classes offered through both the University of California, San Diego and Riverside, Southwestern College, has instructed courses at NAS North Island; and, has been an instructor for the Certified Hazardous Materials Manager (CHMM) exam review. A sampling of his project experience is presented on the following pages.

Project Experience

Management

- Currently providing technical assistance and management for environmental due diligence, contaminant vapor intrusion risk assessment, litigation support, and closure of multiple projects involving release sites for major petroleum companies, other companies, municipalities and government.

- Lead technical teams in laboratory, office, and field settings ranging from management of 12 staff members supporting a full-service construction materials testing laboratory to management of support staff in report preparation while working in the geotechnical and environmental consulting industries. Performed management of site assessment and mitigation efforts simultaneously at as many as 140 contaminated sites, including review and comment on Work Plans, Sampling and Analysis Plans (SAPs), and a wide variety of Technical Reports. Also managed budgeting, regulatory permitting, multiple subcontractors, and sub-consultant, client and community relations and technology vendors, on a variety of both Federal government and private-sector client projects.

- Provided management, as well as regulatory, technical, and field support efforts as needed, for projects conducted at several military facilities under the Navy's CLEAN I and II with Engineering Field Activity West. Included preparation of cost estimates, work plans, sampling plans, quality assurance project plans, health and safety plans, monthly status reports, and technical memorandums and reports. Performed all work on these projects with the goal of mitigating human health and environmental impact concerns leading to closure of the sites by Records of Decision with the oversight agencies.

Engineering and Technology

- Provided project engineering services for the UXO ATDs that took place at the Yuma Proving Ground in Arizona during mid to late 1995. Performed work under contract to the Naval Explosive Ordnance Disposal Technology Division. Also conducted planning and preparation meetings with Yuma Proving Ground representatives, and arranged procurement of equipment and supplies necessary for the demonstration. Included airborne and portable earth-based innovative technologies utilizing combinations of new ground penetrating radar and magnetometer systems.

- Provided engineering support to SITE that included technical and regulatory expertise as needed for a contract to support the EPA's SITE program. Reviewed laboratory sample analysis data for the wastes generated during a SITE demonstration for the Fiery Marsh site at NAS North Island (IR Site 9); completed the necessary Navy, regulatory agency, and civilian disposal company paperwork regarding the wastes; then coordinated the proper recycling, treatment, and disposal of the wastes.

- Provided technical support on an as-needed basis for the U.S. Navy's SCAPS contract. Projects included dense data assessment of several Southwest Division CLEAN underground storage tank (UST) petroleum release sites. Also assisted with the development and testing of SCAPS (a laser-induced fluorescent detector integrated with a cone penetrometer capable of providing real time, in-situ measurement of petroleum contaminant concentrations). Assisted in the field deployment and testing of new SCAPS sensors that were to be used to detect chlorinated solvents, saturated zone interface and hydrogeologic parameters, and heavy metals.

Chemical/Environmental Emergency Response

Responded to approximately 20 emergency response incidents involving abandoned and spilled chemicals from illegal methamphetamine drug labs, fires at industrial facilities (including plating facilities), radioactive sources at landfills, and pesticide spills. Included selection and use of appropriate personal protective equipment (Levels A-C), selection and use of monitoring equipment (CGI/HNu/Draeger tubes and radiation meters), establishment of work zones, containment of spills, identification and categorization of known and unknown chemicals (HAZCAT) with supervision and documentation of cleanup actions.

- Responded to a public emergency incident that involved gasoline released to storm drain systems. Monitored areas for explosive conditions and potential ignition sources. Supervised and documented the cleanup actions taken by a contractor.

- Served on a team that investigated asbestos-contaminated soils that had been placed as fill during construction of a residential area in Paradise Hills, California. Included research of Potentially Responsible Parties (PRPs) who may have disposed of waste asbestos. Provided technical support of the U.S. EPA cleanup that was conducted based on the team's site assessment data.

- Served as the local Regulatory Oversight Specialist for a diesel and gasoline release to Rattlesnake Creek in Poway, California. Performed environmental engineering evaluations and cost analysis related to mitigating further releases to the creek. Began enforcement on PRP when they refused to abate situation as required by law. Provided all technical data to U.S. EPA Region IX when they assumed management and cleanup of the site as an emergency response in conjunction with the U.S. Coast Guard.

Preparedness and Prevention

- Inspected more than 150 businesses that were handling enough hazardous materials to necessitate creation of Chemical Emergency Contingency Plans. Assisted these businesses (including aerospace, plating, equipment manufacturing, furniture building, wastewater treatment related to coating operations, and auto painting) in the preparation of these plans. Facilitated contact between operators of similar industries in order to foster information exchange regarding process safety improvements.

- Served as Site Safety Officer and as a technology observer for the demonstration team during the UXO Detection, Identification, and Remediation Advanced Technology Demonstration at the Yuma Proving Ground in Arizona.

Spill Prevention Control and Countermeasures (SPCC) Plans

- Helped businesses to identify storm drain openings and other pathways by which accidental chemical releases might leave their control. Suggested methods (still) successfully being used to control access to pathways. Conducted re-inspections when warranted.

  Participated as a member of the San Diego Hazardous Waste Task Force (a multi-agency environmental crimes enforcement team) inspection of an aerospace company. Inspection verified and documented the complete lack of a SPCC Plan at the facility and indicated that several serious releases to the environment had occurred as a result. Involved environmental releases of post-process sludges containing heavy metals from metals finishing, plating, and production lines as well as improper handling and releases of both hydrocarbon-based and halogenated solvents.

Technical Support

- Has been instructor for more than 25 courses on emergency response, site assessment, remediation, and public relations for the University of California at San Diego, University of California at Riverside and Southwestern Community College Extensions.

- Assisted the Border Environmental Health Specialist to train County of San Diego Environmental Health Department, U.S. Customs, Environmental, Disaster Preparedness, Fire Department, and local law enforcement inspectors on both sides of the U.S./Mexico border. Regularly interacted with the EPA's REPA program staff to achieve technology transfer objectives.

- Trained U.S. and Mexican Customs and Environmental Inspectors in hazardous waste compliance monitoring. Assisted with the development of course materials for ongoing training, assembled actual contraband hazardous waste case studies, facilitated classes, and participated in the first train-the-trainers session to turn the technology transfer effort over to state and local agency experts in Arizona, California, New Mexico, and Texas.

- Worked through a REPA contract supporting EPA's Border XXI Program aimed at defining a shared vision between governments and communities along the U.S./Mexico border committed to environmental protection and sustainable development. Assisted in authoring guidance documents for Border XXI serving as both Facilitator and Note Taker during Border XXI community meetings along the Arizona/California border. Served as coauthor of the summary document for the meetings, while coordinating the delivery of court reporter transcripts from the meetings held in Arizona, California, New Mexico, and Texas to the EPA. Personal involvement continues with Border XXI as a Citizen Expert.

- Served as a Consultant to EPA officials who participated in the Border XXI binational meeting in Tijuana, Mexico that was held following the domestic community meetings. Also took notes for the public health and safety, emergency response, and solid waste management binational task group sub-meetings.

- Served as co-chairman of the County of San Diego Site Assessment and Mitigation Division's technical work group that developed guidelines for preparation of Community Health and Safety Plans prior to performing environmental assessment and cleanup work at contaminated sites in San Diego County.

- Provided technical and administrative support to US EPA Region 9 during a long-term assessment and cleanup of a release of diesel fuel, kerosene and gasoline to Rattlesnake Creek in Poway, California.

Project Work Plans

- Prepared more than 250 assessment and remediation work plans for all types and sizes of public, municipal, private and U.S. Navy contaminated sites.

- Provided technical review and comment on more than 200 assessment and remediation work plans while working as a regulator.

- Prepared the technology demonstration plan for the U.S. Navy Site Characterization and Analysis Penetrometer System, which led to Cal-EPA and U.S. EPA certification of the technology.

Enforcement

- Provided documentation and information to the County of San Diego District Attorney's Office for an enforcement case on a Clean Water Act (CWA) violation regarding a release of petroleum to a waterway at a gas station release site.

- Provided expert testimony in court for the County of San Diego District Attorney's Office on an enforcement case regarding illegal abandonment and disposal of hazardous materials to the ground. Collected samples of hazardous materials, hazardous wastes, soil, and water to help provide evidence to prove the case.

- Assisted in planning and conducting a field investigation for the County of San Diego's Hazardous Material Task Force on an illegal hazardous waste dumping case.

International

- Provided environmental engineering services on a voluntary basis as a consultant for hazardous materials and public health and safety affairs. Involvement included subterranean explosive gas migration assessment and control, explosive sewer-storm drain conditions abatement, chemical emergency response drills, and air monitoring equipment training and procurement for municipalities and clients in the Republic of Mexico.

- Provided waste sampling and characterization services to Mexican manufacturing companies to characterize waste streams for recycling, treatment, and disposal under Mexican environmental agency scrutiny.

- Provided RCRA enforcement, permitting, and assistance (REPA) for a contract to support the EPA's REPA program, which consisted primarily of technology transfer regarding the management of hazardous materials and wastes to officials of the Republic of Mexico.

Other Related Experience

- Conducted expanded scope Phase I ESAs for two cellular communications Clients to ecologically (natural resources) and archaeologically (cultural and paleontological resources) evaluate remote, FCC-approved, cellular communications equipment and antennae station sites in compliance with CEQA/NEPA guidelines and requirements. Several sites in San Diego, Imperial and Riverside Counties were evaluated. Per CEQA/NEPA requirements, prepared and submitted written requests to government agencies, non-governmental agencies, academic institutions and foundations to assemble the required information. The information was then summarized and included, along with information addressing ASTM Phase I ESA standard criteria, in written reports to the Clients for assembly of final construction permitting packages to be submitted to the FCC, other agencies and stakeholders.

- Proposed, designed, budgeted, and coordinated groundwater and soil exploration and remediation projects. Performed projects involving air pollution control and air resources management. Also provided client support and engineering services, including quality assurance/quality control (QA/QC), during projects. Assisted staff-level engineers and geologists, and provided support for all projects involving regulatory compliance and/or permitting.

- Served as a Hazardous Materials Specialist for the County of San Diego's Department of Environmental Health. Provided consultation and education related to hazardous material and waste management to industry. Inspected hazardous waste generators assisting them in complying with applicable environmental regulations. Educated generators regarding resource recovery methods for hazardous liquids (e.g., used oil and solvents). Conducted special projects as assigned for both industry compliance and site assessment and mitigation.

- Served as Staff Engineer performing various duties to help operate a full-service construction materials testing laboratory. Supervised and scheduled lab and field activities for 4 to 12 engineering and geologic technicians. Assisted environmental engineering group as Staff Chemical/Environmental Engineer on environmental projects, as necessary.

- Served as a Student Engineer at a San Diego utility performing air quality control inspections that involved power plant exhaust stack emissions monitoring and sampling, and conducted laboratory chemical analyses of the air samples. Summarized the inspections for use by the company's management in documenting compliance with local, state, and federal air pollution control regulations. Conducted boiler efficiency testing procedures for two power plants.

Professional Certifications and Registrations

Engineer-in-Training, California (No. XE065066), 1986
Certificate in Hazardous Materials Management, UCSD, 1990
Colorado Listed Environmental Consultant 2000 - 2019
Equivalent 40-Hour OSHA Health & Safety Training (Agency-Grandfathered), 1989
8-Hour OSHA Site Supervisor's Certification, 1992
8-Hour OSHA Health & Safety Annual Update Certification, 1990 - 2018

Continuing Education and Training

Petroleum Vapor Intrusion Webinars - USEPA/OSWER/OUST, Cal/EPA DTSC 2010-2019
Mold Consulting Seminar, SECOR International Inc. - P.A. Platcow, CIH, 2003
8 Hour CPR and First Aid Courses, 1987 – 2015
Chevron Loss Prevention Training, SECOR International Inc. – P.A. Platcow, CIH, 2001
Top Quality Management and Streamlining Principles in Government, MRI, 1992
Incinerable Hazardous Waste Minimization Workshop, Cal-EPA, 1991
Waste Classification and the Land Ban Courses, U.S. EPA, 1990
Hazardous Waste Element of the San Diego Regional Solid Waste Management Plan, UCSD, 1990
Bioremediation of Contaminated Groundwater, Dr. Michael Piotrowski, 1990
Introduction to Environmental/Human Toxicology, UCSD, 1990
Update on Environmental Bioremediation, CDOHS, 1990
How to be a More Effective Supervisor, Career Track, 1990
Environmental Health Services Cross Orientation, County of San Diego (SD), 1990
Hazardous Incident Response Team Annual Level A Emergency Exercises, County of SD, 1990
Court Enforcement Case Preparation, San Diego County District Attorney's Office, 1990
Regulatory Framework for Toxic Substances Courses, UCSD, 1989
Aquifer Testing Methods Symposium, CDOHS, 1989

AB3777 Risk Management and Prevention Planning, UCSD, 1989
Assessment and Remediation of Chemicals in the Environment, UCSD, 1989

Permit Variances, Permit-by-Rule, Transportable Treatment Units Courses, CDOHS, 1989
AB2588 Air Toxic Hot Spots Courses, UCSD, 1989
Quality Assurance/Quality Control for Analytical Methods, Analytical Technologies Inc., 1989
Vector Control and Environmental Health, County of San Diego Vector Control Division, 1989
Hazardous Incident Response Team Contaminated Site Sampling Safety, County of San Diego, 1989
Emergency Preparedness, Response, and Planning, UCSD, 1989
Hazardous Incident Response Team (HIRT) Drug Lab Waste Training, County of SD, 1989
HIRT Hazardous Materials Field Instruments Trials, County of San Diego, 1989
Leaking Underground Storage Tank Tech and Environmental Compliance, California SWRCB, 1988
HIRT SCBA Level A and B Training and Certification, County of San Diego, 1988
Management of Chemical Releases, California Specialized Training Institute (CSTI), 1988
Site Assessment and Mitigation Technology Update Conferences, UCSD, 1988-2002
Principles of Industrial Hygiene Courses, UCSD, 1988

Current Status of the Leaking Underground Fuel Tank (LUFT) Document, CDOHS/DTSC, 1988
Groundwater Hydrogeology Course, Dr. Paul Hargis, UCSD-Extension, 1988
Introduction to Hazardous Materials Management, UCSD-Extension, 1988
Risk Assessment at Chemically Contaminated Sites Symposiums, SDRWQCB, 1988, 1990, 1992

Honors and Awards

Letter of Promotion, County of San Diego, 1988
Letter of Commendation, County of San Diego, 1989
Letter of Commendation, County of San Diego, May 1990
Letter of Commendation, County of San Diego, June 1990
Letters of Commendation, County of San Diego, 1991, 1992 and 1993

Publications and Presentations

Allee, F.A., "Introduction to the Phase 1, 2 and 3 Environmental Site Assessment Process and Regulations: The Rattlesnake Creek, Poway Fuel Release Case Study," presented to the Fall 2017 Hazardous Materials Management Series Class, SWC, San Diego, California, October 16.

Allee, F.A., "Assessment and Cleanup Technologies for Chemically Contaminated Sites, Health & Safety Plans and Environmental Career Pathways," presented to the Hazardous Materials Management Series Class, Southwestern College, San Diego, California, Fall 1993, 1996-2006, Winter 2010, 2014 thru 2019.

Allee, F.A., "Remediation Methods for Petroleum Hydrocarbon-Contaminated Sites," instructor for the Spring 1997 Courses in Newport Beach & Fresno, University of California at Riverside Extension.

Allee, F.A., "Introduction to Wastewater Treatment: The Clean Water Act, and Underground Storage Tank Management," presented at the Fall 1996 CHMM Review Course, University of Cincinnati, St. Louis, Missouri, October 17, 1996.

Allee, F.A., "Introduction to Wastewater Treatment: The Clean Water Act, and Underground Storage Tank Management," presented at the Fall 1996 CHMM Review Course, University of Cincinnati, St. Louis, Missouri, October 17, 1996.

Allee, F.A., "Introduction to the County of San Diego's Site Assessment and Mitigation Division: Regulations, Organization Structure, and Operations." presented to the Fall 1994 Regulatory Framework for Toxic Substances Class, University of California/San Diego (UCSD), La Jolla, California, October 4, 1994.

Allee, F.A., "Assessment and Cleanup Technologies for Chemically Contaminated Sites," presented to the Fall 1994 Hazardous Materials Management Series Class, SWC, San Diego, California, September 27, 1994 and October 29, 2014.

Allee, F.A., "Introduction to the County of San Diego's Site Assessment and Mitigation Division: Regulations, Organization Structure, and Operations," presented to the Spring 1994 Regulatory Framework for Toxic Substances Class, UCSD, La Jolla, California, April 6, 1994.

Allee, F.A. and P.M. Tanner, "Accomplishments of the Department of Environmental Health's (DEH) Customer Service Improvement Team," presented to the DEH Assistant Director and Division Chief's, San Diego, California, March 21, 1994.

Allee, F.A. and C. Bejar L., "Introduction to the Regulation of Underground Storage Tank Systems and Unauthorized Releases: The Rattlesnake Creek, Poway Fuel Release Case Study," presented to the Spring 1994, 2014 and 2015 Hazardous Materials Management Series Class, SWC, San Diego, California, March 16, 1994, March 24, 2014, March 16, 2015 and March 14, 2016.

Allee, F.A., "Accomplishments of the DEH's Customer Service Improvement Team," presented to the DEH Management Enhancement Group, San Diego, California, February 23, 1994.

Allee, F.A. and C. Bejar L., "Introduction to the Regulation of Hazardous Materials and Wastes: San Diego County's Industry Compliance Program: The Nelco Oil Co., National City Case Study," presented to the Fall 1994 Hazardous Materials Management Series Class, SWC, San Diego, California, November 9, 1994.

Allee, F.A., "Introduction to the County of San Diego's Site Assessment and Mitigation Division: Regulations, Organization Structure, and Operations," presented to the Fall 1993 Regulatory Framework for Toxic Substances Class, University of California/San Diego (UCSD), La Jolla, California, October 6, 1993.

Allee, F.A., "Assessment and Cleanup Technologies for Chemically Contaminated Sites," presented to the Fall 1993 Hazardous Materials Management Series Class, SWC, San Diego, California, September 30, 1993.

Allee, F.A. and C. Bejar L., "Introduction to the Regulation of Underground Storage Tank Systems and Unauthorized Releases: The Rattlesnake Creek, Poway Case Study," presented to the Spring 1993 Hazardous Materials Management Series Class, SWC, San Diego, California, April 12, 1993.

Allee, F.A., "Introduction to the County of San Diego's Site Assessment and Mitigation Division: Regulations, Organization Structure, and Operations," presented to the Spring 1993 Regulatory Framework for Toxic Substances Class, University of California/San Diego (UCSD), La Jolla, California, April 7, 1993.

Allee, F.A., "Current Status of the Poway Rattlesnake Creek Fuel Release: Community Health and Safety Concerns," presented at a special Poway Community Meeting, Poway, California, September 25, 1993.

Allee, F.A., "Current Status of the Poway Rattlesnake Creek Fuel Release: Administrative & Technical Approaches to Mitigate Community Health and Safety Concerns and Environmental Impacts," presented to the Poway Mayor and City Council, Town Hall, Poway, California, September 26, 1993.

Allee, F.A. and C. Bejar L., "Introduction to the Regulation of Hazardous Materials and Wastes: San Diego County's Industry Compliance Program: The Nelco Oil Co., National City Case Study," presented to the Fall 1992 Hazardous Materials Management Series Class, SWC, San Diego, California, October 27, 1992.

Allee, F.A., "Introduction to the County of San Diego's Site Assessment and Mitigation Division: Regulations, Organization Structure, and Operations," presented to the Fall 1992 Regulatory Framework for Toxic Substances Class, UCSD, September 1992, 1993, 1994, 1997.

BERNARD A. SENTIANIN, PG
Senior Geologist

M.S. Geology, 1989
San Diego State University
B.A. Geology, 1985
California State University, Bakersfield

As a senior project manager, he has hands on experience investigating, designing, installing, and managing large scale projects involving excavation/removals, above ground and in-situ remediation, soil vapor extraction, ventilation, and groundwater extraction/treatment. He has 30 years of environmental project management experience, and over 32 years professional geologic experience. Mr. Sentianin has extensive experience in planning, implementing and evaluating Phase I and Phase II environmental assessments in commercial real estate transactions.

Professional Experience

1997 TO 2019 Senior Geologist, EEI - As Senior Geologist of EEI since 1997, Mr. Sentianin provides consulting and technical services as a project manager, expert witness, third party reviewer, and senior geologist for development related due diligence, and well as investigation and cleanup efforts at sites impacted by Petroleum Hydrocarbons, heavy metals, pesticides, and chlorinated solvents.

1991 TO 1997 Senior Geologist, Senior Project Manager for PW Environmental - Established in-house engineering and consulting services for mid-sized environmental contractor. Established regulatory, vendor, and client contacts. Initiated policies governing technical report content and format and instituted in- house training program for new technical staff. Selected prioritized and procured required support equipment. Actively managed Phase I and Phase II investigation and remediation projects. Reviewed assessment data, prepared feasibility studies, and evaluated remedial alternatives while preparing Remedial Action Plans (RAP) for fuel, heavy metal, and solvent-impacted sites. Prepared health-based risk assessment on large cleanup site adjacent to health care facility. Permitted, implemented, and successfully completed the first in-situ groundwater bioremediation system in Ventura County. Reviewed and implemented numerous Phase I and Phase II environmental site assessments throughout Central and Southern California.

1989 TO 1991 Staff/Project Geologist for Nachant Environmental, Inc. - Planned, implemented, and managed environmental site investigations and remediation projects following appropriate regulatory and professional guidelines. Prepared and reviewed project cost proposals, correspondence, regulatory permits, assessment and investigation reports, and remedial action plans.

1987 to 1989 Teaching Assistant - San Diego State University Department of Geological Sciences and Department of Engineering.

Project Experience

Former Asphalt Plant, San Jose, CA. Assisted developer client with managing a large industrial site with multiple issues and negotiating closure requirements with Santa Clara County Environmental Health. Conducted additional investigations necessary to satisfy regulatory requirements, allowing development to continue while keeping residual petroleum contamination in place under managed conditions. Prepared closure report and summary of previous remedial and investigative efforts, obtaining closure.

Former Light Industrial Properties, Campbell, CA. Assisted residential developer with due diligence, investigation, and ultimately remediation of several contiguous industrial properties, formerly utilized for automotive repair, auto body work, construction material sales, and heavy equipment rental. Addressed City of Campbell and San Francisco Regional Water Quality Control Board concerns, obtaining approval/closure of open cases, allowing full development as multifamily residential.

Residential and Commercial Redevelopment Projects, Bay Area, CA. Conducted environmental due diligence and assisted with redevelopment planning for residential and commercial developers throughout the Bay Area and Sacramento Basin, including the communities of San Jose, Millbrae, Menlo Park, Sunnyvale, Oakland, Berkeley, Union City, Fremont, Antioch, Santa Rosa, Windsor, and the greater Sacramento metropolitan area including Stockton, Sacramento, West Sacramento, Roseville, Lincoln, Linda, and Auburn.

Southside Garden and Fremont Mews, Sacramento, CA. Conducted Phase I and Phase II environmental site assessments and evaluated environmental concerns on two community garden projects on behalf of the Capitol Area Development Authority. Coordinated regulatory oversight with Sacramento County Environmental Management Division and the State Office of Environmental Health Hazard Assessment. Prepared and evaluated requests for proposals for cleanup contractors and provided remediation oversight and management. Prepared closure documentation and obtained regulatory signoff form both the Southside Garden and Fremont Mews projects.

K Street Corridor – Sacramento, CA. Evaluated and conducted Phase I environmental site assessments on three block area of downtown Sacramento, as well as a number of individual properties in other areas within the K Street Corridor, on behalf of the City of Sacramento Downtown Development Group.

Globe Mills, Sacramento, CA. Conducted Phase I and Phase II environmental site assessment, evaluated environmental concerns and managed remediation for adaptive reuse project on behalf of Sacramento Housing and Redevelopment Agency. Coordinated regulatory oversight of the project with Sacramento County Environmental Management Division.

Electronics Manufacturing Facility/Fueling Depot, Santa Monica, CA. Performed soil and groundwater investigation, feasibility testing and evaluation of fuel hydrocarbon and chlorinated solvent plumes. Prepared RAP with design criteria for soil vapor extraction. After approval of RAP by State regulators, implemented and successfully completed remediation at site, obtaining closure.

Former Aerospace Facility, Santa Ana, CA. Evaluated existing Phase I and Phase II assessments. Performed soil, soil vapor, and groundwater investigations of chlorinated solvent plumes at multiple locations on site. Modeled and evaluated potential plume source areas. Initiated site-specific sampling protocol for chlorinated solvents. Liaison with lead regulatory agency regarding regional contamination issues and site closure requirements.

Major Land Owner/Developer, San Juan Capistrano, CA. Conducted Phase I and Phase II environmental site assessments at multiple sites in southern Orange County. Evaluated potential environmental concerns related to sand & gravel operations, fueling facilities, ordinance testing facilities, aerospace engineering labs, vehicle maintenance and repair facilities, agricultural operations, and illicit dump sites.

Professional Certifications and Registrations

Professional Geologist No. 5530, State of California.
40-Hour OSHA Health & Safety Training (29 CFR 1910.120)
8-Hour OSHA Health & Safety Annual Refresher Training

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

N/A

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

PRELIMINARY WQMP EXHIBIT
FOR TPM 37890
CITY OF JURUPA VALLEY, IN THE COUNTY OF RIVERSIDE
STATE OF CALIFORNIA

WATER QUALITY SITE SUMMARY

DRAINAGE AREA	DRAINAGE MANAGEMENT AREA	COVER TYPE	AREA	AREA	EXISTING SITE IMPERVIOUS AREA	PROPOSED SITE IMPERVIOUS AREA	PROPOSED SITE PERVIOUS AREA	Vbmp	Qbmp
			SF	AC	SF	SF	SF	CF	CFS
DA1	A	ROOF	178,789	4.1	13,796	940,091	132,477	54,000	4.0
	B	LANDSCAPE	132,477	3.0					
	C	CONCRETE/AC	761,302	17.5					
TOTALS		--	1,072,568	24.6	1.3%	88%	12%	--	--
DA2	A	ROOF	40,454	0.9	2,261	249,377	62,719	14,800	1.1
	B	LANDSCAPE	62,719	1.4					
	C	CONCRETE/AC	208,923	4.8					
TOTALS		--	312,096	7.2	0.7%	80%	20%	--	--
SITE TOTAL			1,384,664	31.8				68,800	5.1

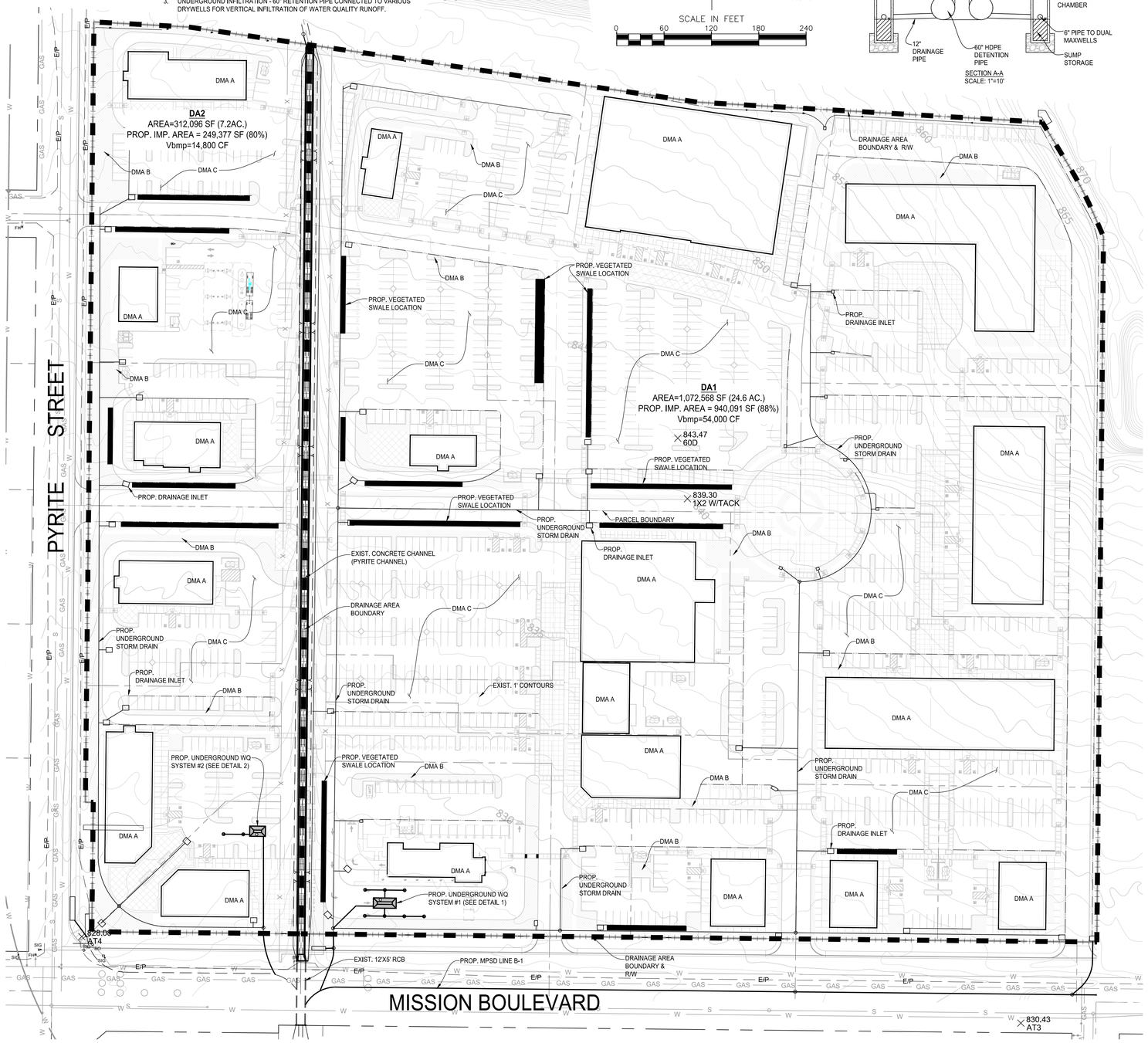
WATER QUALITY MITIGATION SUMMARY

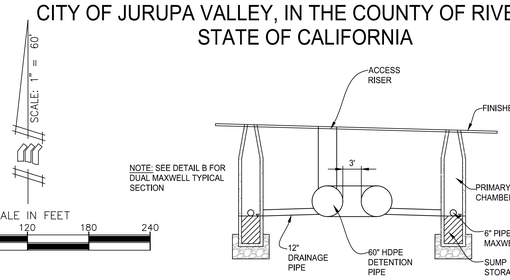
WATER QUALITY RUNOFF FROM THE PROJECT SITE WILL SHEETFLOW AND GUTTERFLOW TO VARIOUS CURB OPENING AND DROP INLETS THROUGHOUT THE SITE. IN SOME AREAS, PRIOR TO BEING INTERCEPTED, FLOWS WILL TRAVEL THROUGH A VEGEATED BIORETENTION FACILITY, OR VEGETATED SWALE FOR TREATMENT AND PARTIAL INFILTRATION PRIOR TO BEING INTERCEPTED BY UNDERGROUND STORM DRAIN.

THERE ARE TWO MAJOR DRAINAGE AREAS ONSITE, BISECTED BY THE PROPOSED REINFORCED CONCRETE BOX (PROPOSED REPLACEMENT OF EXISTING CONCRETE CHANNEL). THE EAST SIDE OF THE RCB IS DA1, AND THE WEST IS DA2. PRIOR TO FLOWS ENTERING THE RCB, A LOW FLOW DIVERSION INLET WILL INTERCEPT THE WATER QUALITY VOLUME REMAINING AND ROUTE IT INTO UNDERGROUND RETENTION PIPE. THE RETENTION PIPE WILL BE CONNECTED TO PROPOSED TORREN RESOURCES MAXWELL PLUS DRAINAGE SYSTEMS. THESE SYSTEMS CONSIST OF A PRIMARY SETTLING CHAMBER TO REMOVE OIL, POLLUTANTS, TRASH, DEBRIS, AND SEDIMENT FROM THE RUNOFF BEFORE ROUTING IT INTO ADJACENT DRYWELLS. THE DRYWELLS WILL PERCOLATE RUNOFF VERTICALLY AT DEPTHS UP TO 60 FT.

LIST OF PROPOSED BMPS

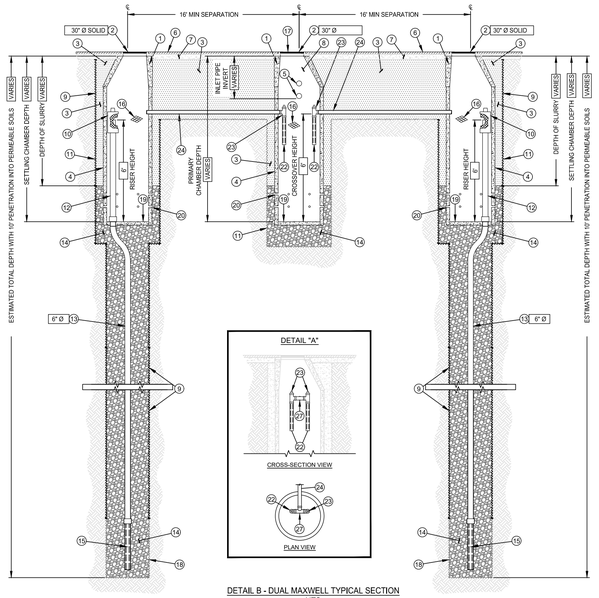
1. STORM DRAIN INLET/CATCH BASIN STENCILING - DISCOURAGE ILLEGAL DUMPING AND PROMOTE ENVIRONMENTAL AWARENESS AND PROTECTION OF STORM WATER QUALITY.
2. VEGETATED SWALES/ BIORETENTION FACILITIES - RUNOFF IN VARIOUS AREAS WILL BE ROUTED TO PROPOSED VEGETATED SWALES TO TREAT AND PARTIALLY INFILTRATE RUNOFF BEFORE IT ENTERS THE UNDERGROUND STORM DRAIN SYSTEM.
3. UNDERGROUND INFILTRATION - 60" RETENTION PIPE CONNECTED TO VARIOUS DRYWELLS FOR VERTICAL INFILTRATION OF WATER QUALITY RUNOFF.





NOTE: SEE DETAIL B FOR DUAL MAXWELL TYPICAL SECTION

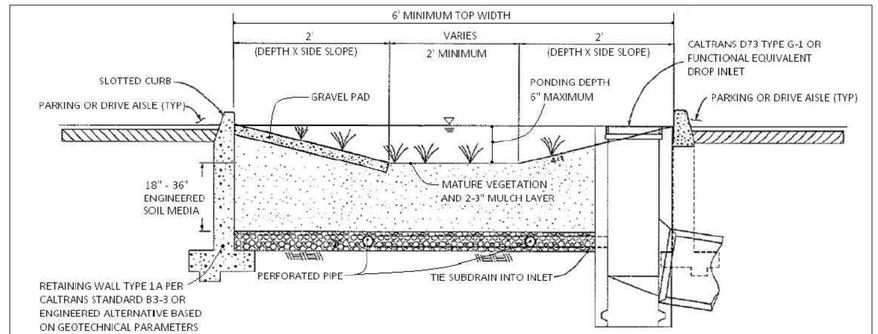
SECTION A-A
SCALE: 1"=10'



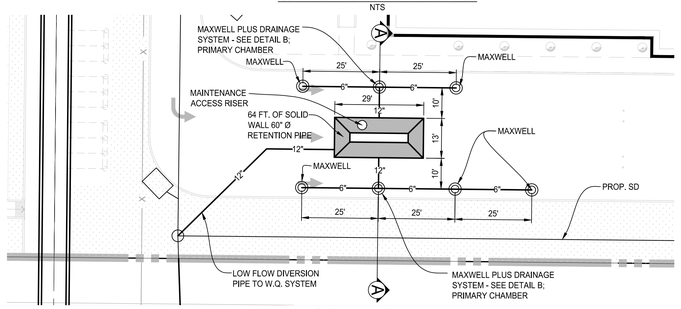
DETAIL B - DUAL MAXWELL TYPICAL SECTION
NTS

ITEM NUMBERS

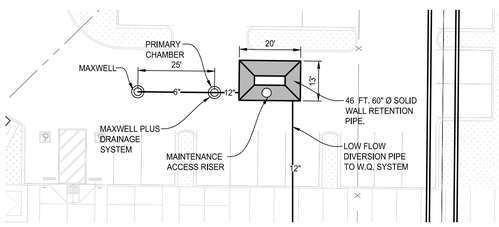
1. **MANHOLE CONE** - MODIFIED FLAT BOTTOM.
2. **BOLTED RING & GRATE/COVER** - DIAMETER & TYPE AS SHOWN. CLEAN CAST IRON WITH WORDING **"STORM WATER ONLY"** IN RAISED LETTERS. **BOLTED IN 2 LOCATIONS** AND SECURED TO CONE WITH MORTAR. RIM ELEVATION ±0.02' OF PLANS.
3. **STABILIZED BACKFILL** - TWO-SACK SLURRY MIX.
4. **PRE-CAST LINER** - 4000 PSI CONCRETE 48" ID, X 54" OD, **CENTER IN HOLE** AND ALIGN SECTIONS **TO MAXIMIZE BEARING SURFACE.**
5. **INLET PIPE/OUTLET PIPE** (BY OTHERS), SEE SEPARATE PLAN FOR INVERT ELEVATIONS.
6. **GRADED BASIN OR PAVING** (BY OTHERS).
7. **COMPACTED BASE MATERIAL**, IF REQUIRED (BY OTHERS).
8. **FREEBOARD DEPTH VARIES** WITH INLET PIPE ELEVATION. INCREASE PRIMARY AND SECONDARY CHAMBER DEPTHS AS NEEDED TO MAINTAIN ALL INLET PIPE ELEVATIONS ABOVE RISER PIPE.
9. **NON-WOVEN GEOTEXTILE SLEEVE** - MIRAFI 140 NL, MIN. 6 FT Ø. HELD APPROX. 10 FEET OFF THE BOTTOM OF EXCAVATION.
10. **PUREFLO® DEBRIS SHIELD** - ROLLED 16 GA. STEEL X 24" LENGTH WITH VENTED ANTI-SIPHON AND INTERNAL 0.265" MAX. SWG FLATTENED EXPANDED STEEL SCREEN X 12" LENGTH. **FUSION BONDED EPOXY COATED.**
11. **MIN. 6' Ø DRILLED SHAFT.**
12. **RISER PIPE** - SCH. 40 PVC MATED TO DRAINAGE PIPE AT BASE SEAL.
13. **DRAINAGE PIPE** - ADS HIGHWAY GRADE OR SCH. 40 PVC WITH TRI-A COUPLER, SUSPEND PIPE DURING BACKFILL OPERATIONS. DIAMETER AS NOTED.
14. **ROCK** - WASHED, SIZED BETWEEN 3/8" AND 1-1/2".
15. **FLOFAST® DRAINAGE SCREEN** - SCH. 40 PVC 0.120" SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/FT, WITH TRI-B COUPLER, OVERALL LENGTH VARIES, UP TO 120" WITH TRI-B COUPLER.
16. **ABSORBENT** - HYDROPHOBIC PETROCHEMICAL SPONGE. MIN. 128 OZ. CAPACITY. TYPICAL, 2 PER CHAMBER.
17. **FABRIC SEAL** - U.V. RESISTANT GEOTEXTILE - **TO BE REMOVED BY CUSTOMER** AT PROJECT COMPLETION. GRATED ONLY.
18. **MIN. 4' Ø DRILLED SHAFT.**
19. **BASE SEAL** -CONCRETE SLURRY
20. **6 PERFORATIONS MINIMUM PER FOOT, 2 ROWS MINIMUM.**
21. NOT USED.
22. **DUAL INTAKE SCREEN - 4" Ø** SCH. 40 PVC 0.120" MODIFIED SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/ FT. OVERALL LENGTH WITH TRI-B COUPLER PER DETAIL, REFER TO "DETAIL A" HEREON.
23. **VENTED ANTI-SIPHON INTAKE WITH FLOW REGULATOR.**
24. **CONNECTOR PIPE - 4" Ø** SCH. 40 PVC.
27. **4" Ø SCH. 40 PVC TEE**



BIORETENTION FACILITY - TYPICAL CROSS SECTION
NTS



UNDERGROUND SYSTEM #1
SCALE: 1"=20'



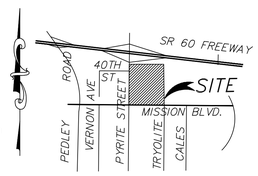
UNDERGROUND SYSTEM #2
SCALE: 1"=20'

LEGEND

AC.	ACRES
CB	CATCH BASIN
C.L. C/L	CENTERLINE
EX	EXISTING
EG	EXISTING GROUND
FG	FINISH GRADE
F.L.	FLOW LINE
SD	STORM DRAIN
SF	SQUARE FEET
NTS	NOT TO SCALE
DMA	DRAINAGE MANAGEMENT AREA
DA	DRAINAGE AREA
PROP.	PROPOSED
W.Q.	WATER QUALITY
R.C.B.	REINFORCED CONCRETE BOX
R.C.P.	REINFORCED CONCRETE PIPE
R/W	RIGHT OF WAY
T.C.	TOP OF CURB

OWNER/DEVELOPER
PANORAMA DEVELOPMENT
2005 WINSTON COURT
UPLAND, CA 91784
CONTACT: WES FIFIELD
NUMBER: 909.931.3363

CIVIL ENGINEER
MADOLE & ASSOCIATES, INC.
9302 PITTSBURGH AVENUE, SUITE 230
RANCHO CUCAMONGA, CA 91730
CONTACT: JEFFREY RUPP
NUMBER: 909.481.6322



VICINITY MAP
NO SCALE

APN: 171-020-001; 171-020-025

THE SHOPS AT JURUPA VALLEY
NEC MISSION BLVD AT PYRITE STREET
CITY OF JURUPA VALLEY, CA.

McKently Malak ARCHITECTS
35 Hugus Alley, Suite 200
Pasadena, California 91103-3648
TEL 626.583.8348 FAX 626.583.8387

DATE	BY	MARK	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

PREPARED UNDER THE SUPERVISION OF:

MADOLE & ASSOCIATES, INC.
Engineering Communities for Life

9302 PITTSBURGH AVE, SUITE 230
RANCHO CUCAMONGA, CA. 91730
PHONE: 909.481.6322
FAX: 909.481.6320

PRELIMINARY WQMP EXHIBIT
FOR TPM 37890

CITY OF JURUPA VALLEY

SHEET NO. 1 OF 1 SHEETS
PLAN NUMBER TPM____

J.N. 795-2849; TENTATIVE PARCEL MAP 37890

DRAWING PATH J:\795-2849\WQMP\WQMP_Exhibit.dwg

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: MADOLE & ASSOCIATES, INC — Date: 2/18/2020

Designed by: TAYLOR SKAHILL — Case No:

Company Project Number/Name: THE SHOPS AT JURUPA VALLEY

BMP Identification

BMP NAME / ID: UNDERGROUND INFILTRATION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.74 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A	*178,789*	*Roofs*	*1*	*0.89*	*159479.8*			
DMA B	*132,477*	*Natural (D Soil)*	*0.4*	*0.28*	*37055.4*			
DMA C	*761,302*	*Concrete or Asphalt*	*1*	*0.89*	*679081.4*			
	1072568	***Total***			**875616.6**	**0.74**	***53996.4***	***54,000***

Notes:

Bioretention Facility - Design Procedure	BMP ID: DA1 - SWALES	Legend:	Required Entries / Calculated Cells

Company Name: MADOLE & ASSOCIATES, INC. Date: 2/19/2020

Designed by: TGS County/City Case No.: TPM 37890

Design Volume

Enter the area tributary to this feature A_T = -- acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP} = 11,000 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.23 ft

Minimum Surface Area, A_m

$$A_M\,(ft^2) = \frac{V_{BMP}\,(ft^3)}{d_E\,(ft)}$$

A_M = 8,919 ft^2

Proposed Surface Area A= 8,919 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain inches

Longitudinal Slope of Site (3% maximum) 2.5 %

6" Check Dam Spacing 10 feet

Describe Vegetation:

Notes: FURTHER IN DEPTH DESIGN TO BE PROVIDED IN FINAL WQMP

MADOLE & ASSOCIATES, INC.
Engineering Communities for Life

Job: THE SHOPS AT JURUPA VALLEY
Job No. 795-2849
Calculated by: TS
Date: 2/19/2020

DA1 DESIGN CAPTURE VOLUME

Vbmp =	**54,000**	**FT^3**
Qbmp =	**4**	**CFS**
VEGETATED SWALES, Vret =	**11,000**	**FT^3**
Vbmp =	**43,000**	**FT^3**

DA1 INJECTION WELLS

P_{design}	8.1	IN/HR
P_{design}	0.00019	FT/SEC
T	24.00	hours
D_{INF}=	40	FT
$SA_{INF} = D_{INF}*12.57 + 12.57 =$	515.37	FT^2
	0.09663	CFS
24 HOUR VOLUME= $P_{DESIGN}*SA_{INF}*T_{FILL}$ =	**8,349**	**FT^3**
PROP. No. OF INJECTION WELLS =	5	EA.
INJECTION WELL RETENTION VOLUME =	**41,745**	**FT^3**

DA1 - PIPE LENGTH

PROPOSED PIPE DIAMETER =	5	FT
REQUIRED LENGTH OF PIPE =	64	FT

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: MADOLE & ASSOCIATES, INC — Date: 2/18/2020

Designed by: TAYLOR SKAHILL — Case No:

Company Project Number/Name: THE SHOPS AT JURUPA VALLEY

BMP Identification

BMP NAME / ID: UNDERGROUND INFILTRATION - DA2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.74 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A	*40,454*	*Roofs*	*1*	*0.89*	*36085*			
DMA B	*62,719*	*Natural (D Soil)*	*0.4*	*0.28*	*17543.3*			
DMA C	*208,923*	*Concrete or Asphalt*	*1*	*0.89*	*186359.3*			
	312096	***Total***			**239987.6**	**0.74**	***14799.2***	***14,800***

Notes:

Bioretention Facility - Design Procedure	BMP ID: DA2 - SWALES	Legend:	Required Entries / Calculated Cells

Company Name: MADOLE & ASSOCIATES, INC. Date: 2/21/2020

Designed by: TGS County/City Case No.: TPM 37890

Design Volume

Enter the area tributary to this feature A_T = -- acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP} = 5,000 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.23 ft

Minimum Surface Area, A_m

$$A_M\,(ft^2) = \frac{V_{BMP}\,(ft^3)}{d_E\,(ft)}$$

A_M = 4,055 ft^2

Proposed Surface Area A= 4,123 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain inches

Longitudinal Slope of Site (3% maximum) 2.5 %

6" Check Dam Spacing 10 feet

Describe Vegetation:

Notes: FURTHER DESIGN TO BE PROVIDED IN FINAL WQMP

MADOLE & ASSOCIATES, INC.
Engineering Communities for Life

Job: THE SHOPS AT JURUPA VALLEY
Job No. 795-2849
Calculated by: TS
Date: 2/19/2020

DA2 DESIGN CAPTURE VOLUME

Vbmp =	**14,800**	**FT^3**
Qbmp =	**1.1**	**CFS**
VEGETATED SWALES, Vret =	**5,000**	**FT^3**
Vbmp =	**9,800**	**FT^3**

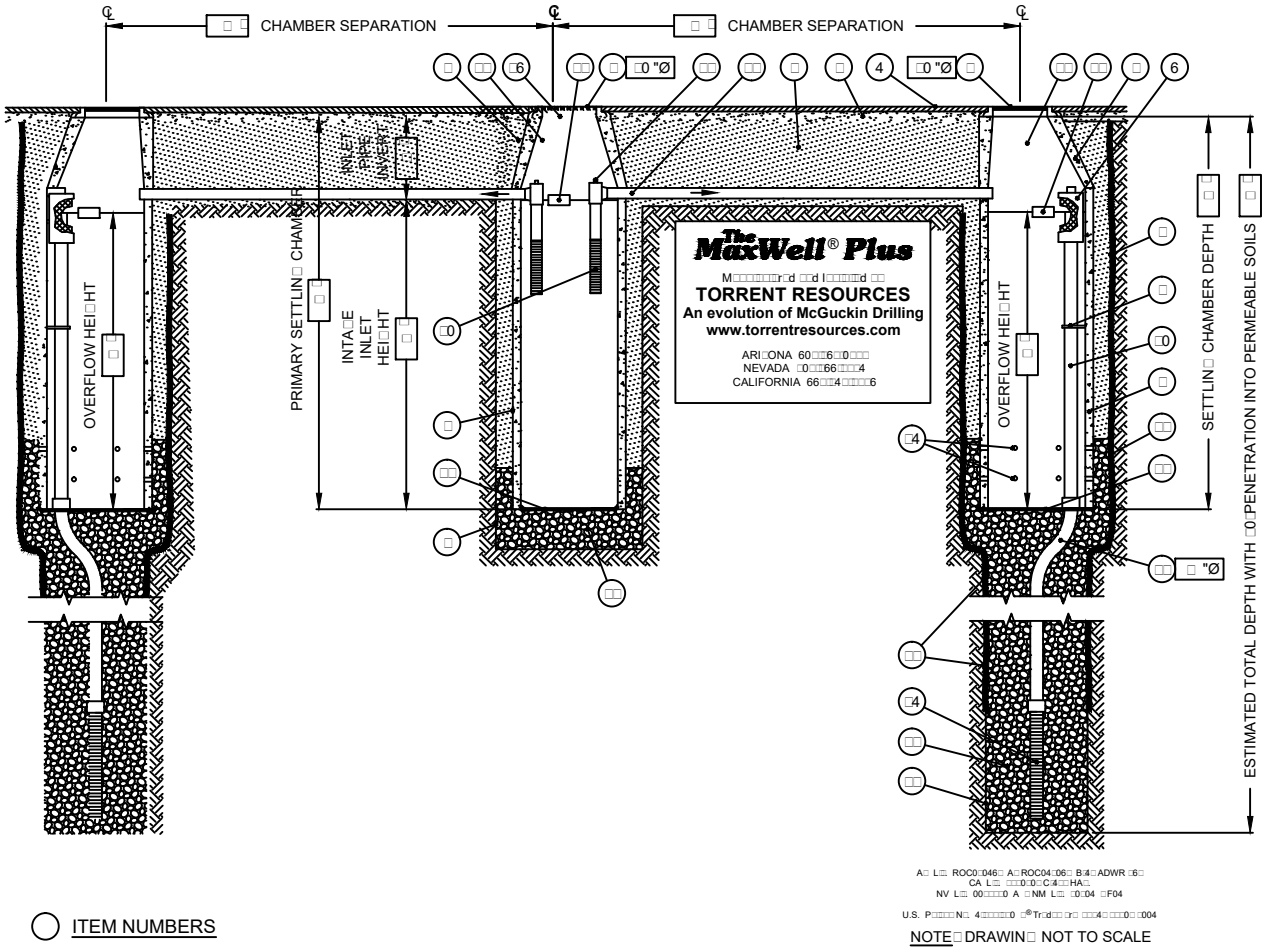
DA2 INJECTION WELLS

P_{design}	7.7	IN/HR
P_{design}	0.00018	FT/SEC
T	24.00	hours
D_{INF}=	45	FT
$SA_{INF} = D_{INF}*12.57 + 12.57 =$	578.22	FT^2
	0.10306	CFS
24 HOUR VOLUME= $P_{DESIGN}*SA_{INF}*T_{FILL}$ =	**8,905**	**FT^3**
PROP. No. OF INJECTION WELLS =	1	EA.
INJECTION WELL RETENTION VOLUME =	**8,905**	**FT^3**

DA2 - PIPE LENGTH

PROPOSED PIPE DIAMETER =	5	FT
REQUIRED LENGTH OF PIPE =	46	FT

M□d□□□d M□□W□□□® P□□□ Dr□□□□□□ S□□□□□ D□□□□A□d S□□□□□□□□□□□□



A□ L□ ROCO□046□ A□ROCO4□06□ B□4□ ADWR □6□
CA L□ □□0□0□C4□HA□
NV L□ 00□□□0 A □NM L□ □0□04 □F04

U.S. P□□□□N□ 4□□□□□0 □®Tr□d□□ □r□ □□4□□□0□□004

NOTE□DRAWIN□ NOT TO SCALE

◯ ITEM NUMBERS

□. **MANHOLE CONE** □MODIFIED FLAT BOTTOM.

□. **STABILIZED BACKFILL** □TWO□SAC□ SLURRY MI□.

□. **BOLTED RING & GRATE/COVER** □DIAMETER AS SHOWN. CLEAN CAST IRON WITH WORDIN□ "STORM WATER ONLY" IN RAISED LETTERS. BOLTED IN □ LOCATIONS AND SECURED TO CONE WITH MORTAR. RIM ELEVATION ±0.02' OF PLANS.

4. **GRADED BASIN OR PAVING** □BY OTHERS□

□. **COMPACTED BASE MATERIAL** □BY OTHERS□

6. **PUREFLO® DEBRIS SHIELD** □ROLLED □6 □A. STEEL □ □4" LEN□TH WITH VENTED ANTI□SIPHON AND INTERNAL .□6□" MA□. SWO FLATTENED E□PANDED STEEL SCREEN □ □□" LEN□TH. **FUSION BONDED EPOXY COATED**.

□. **PRE-CAST LINER** □4000 PSI CONCRETE 4□" ID. □ □4" OD. **CENTER IN HOLE** AND ALI□N SECTIONS TO **MAXIMIZE BEARING SURFACE**.

□. **MIN. 6' Ø DRILLED SHAFT**.

□. **SUPPORT BRACKET** □FORMED □□ □A. STEEL. **FUSION BONDED EPOXY COATED**.

□0. **OVERFLOW PIPE** □SCH. 40 PVC MATED TO DRAINA□E PIPE AT BASE SEAL.

□□. **DRAINAGE PIPE** □ADS HI□HWAY □RADE WITH TRI□A COUPLER. **SUSPEND PIPE** DURIN□ BAC□FILL OPERATIONS TO PREVENT BUC□LIN□ OR BREA□A□E. DIAMETER AS NOTED.

□□. **BASE SEAL** □□EOTE□TILE□POLY LINER OR CONCRETE SLURRY.

□□. **ROCK** □CLEAN AND WASHED □□□" TO □□□□□" A□ □RE□ATE.

□4. **FLOFAST® DRAINAGE SCREEN** □SCH. 40 PVC 0.□□0" SLOTTED WELL SCREEN WITH □□ SLOTS PER ROW□FT. DIAMETER VARIES □6" OVERALL LEN□TH WITH TRI□B COUPLER.

□□. **MIN. 4' Ø SHAFT** □DRILLED TO **MAINTAIN PERMEABILITY** OF DRAINA□E SOILS.

□6. **FABRIC SEAL** □U.V. RESISTANT □EOTE□TILE □**TO BE REMOVED BY CUSTOMER** AT PROJECT COMPLETION.

□□. **ABSORBENT** □HYDROPHOBIC PETROCHEMICAL SPON□E. MIN. □□□ O□. CAPACITY. TYPICAL□TWO □□□PER CHAMBER.

□□. **CONNECTOR PIPE** - 4" Ø SCH. 40 PVC .

□□. **VENTED ANTI-SIPHON INTAKE WITH FLOW REGULATOR.**

□0. **INTAKE SCREEN** - 4" Ø SCH. 40 PVC 0.120" MODIFIED SLOTTED WELL SCREEN WITH □□ SLOTS PER ROW□FT. 4□" OVERALL LEN□TH WITH TRI□C END CAP.

□□. **FREEBOARD DEPTH VARIES** WITH INLET PIPE ELEVATION. INCREASE PRIMARY□SECONDARY SETTLIN□ CHAMBER DEPTHS AS NEEDED TO MAINTAIN ALL INLET PIPE ELEVATIONS ABOVE CONNECTOR PIPE OVERFLOW.

□□. **OPTIONAL INLET PIPE** □BY OTHERS□

□□. **NON-WOVEN GEOTEXTILE SLEEVE,** MIRAFI 140 NL. MIN. 6 FT Ø, HELD APPRO□. □0 FEET OFF THE BOTTOM OF E□CAVATION.

□4. **EIGHT (8) 1.25" DIAMETER HOLES** PER FOOT WHERE NOTED.

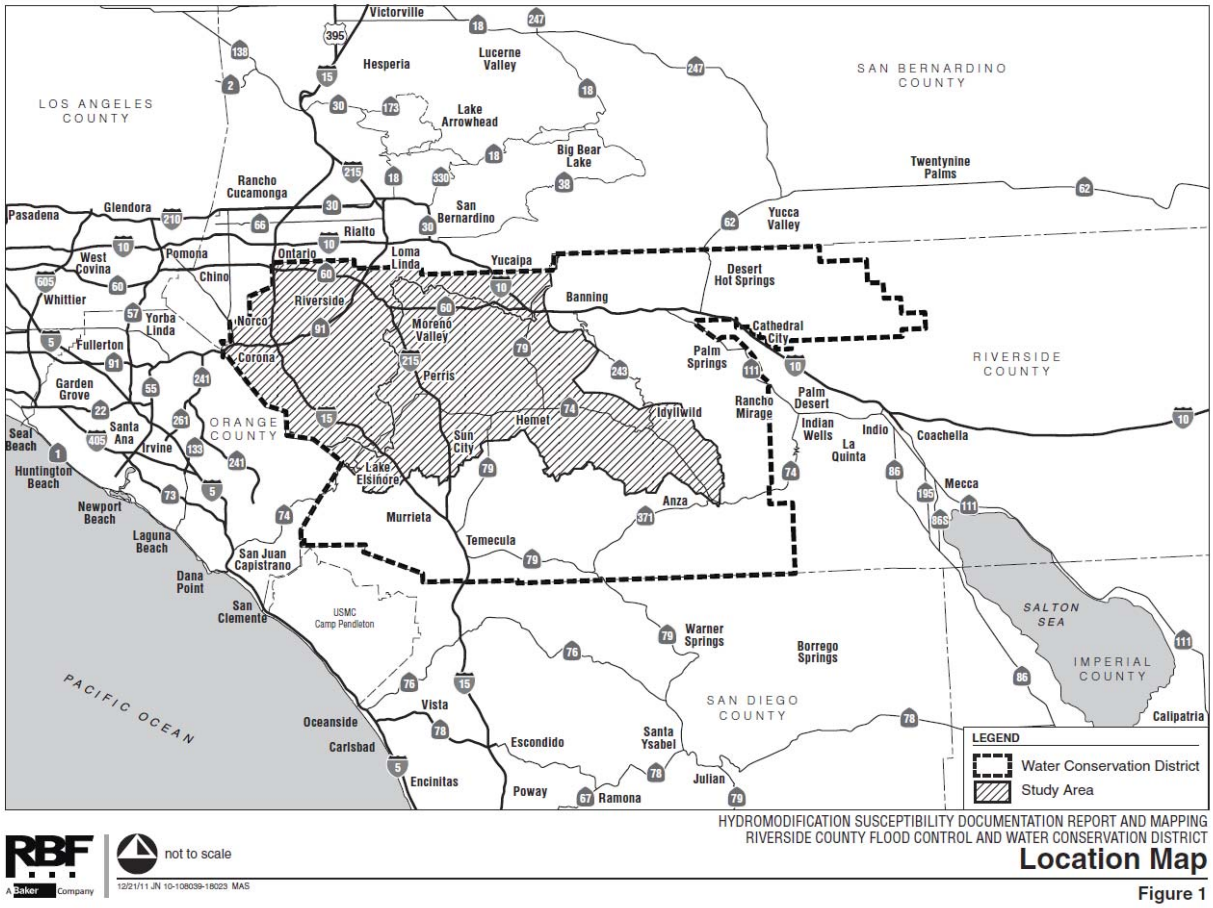
Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

N/A

EXEMPT DUE TO EHM DOWSTREAM DRAINAGE SYSTEMS (HCOC EXEMPTION 3)

Figure 1: Location Map



Unmitigated high volumes and velocities of discharges from MS4 facilities associated with New Development into natural watercourses from developed areas without needed controls can alter the natural rate of change of a stream and may adversely impact aquatic ecosystems and stream habitat and may cause stream bank erosion and physical modifications. These changes are the result of Hydromodification.

According to Section XII.E.9 of the Permit, a New Development and Significant Redevelopment project does not cause a HCOC if any one of the following conditions is met:

1. The project disturbs less than one acre and is not part of a common plan of development.
2. The volume and the time of concentration of stormwater runoff for the post-development condition is not significantly different from pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant). This may be achieved through Site Design and Treatment Control BMPs.
3. All downstream conveyance channels to an Adequate Sump (e.g., Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River or other lake, reservoir or natural resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity, and no sensitive stream habitat areas will be affected; or not identified in the Permittees' Hydromodification sensitivity maps required in Section XII.B, and no sensitive stream habitat areas will be affected.
4. The Permittees may request a variance from these criteria based on studies conducted by the Southern California Monitoring Coalition (SMC), Southern California Coastal Watershed Research Project (SCCWRP), California Association of Stormwater Quality Agencies (CASQA), or other regional studies.

1.3 Goals and Objectives

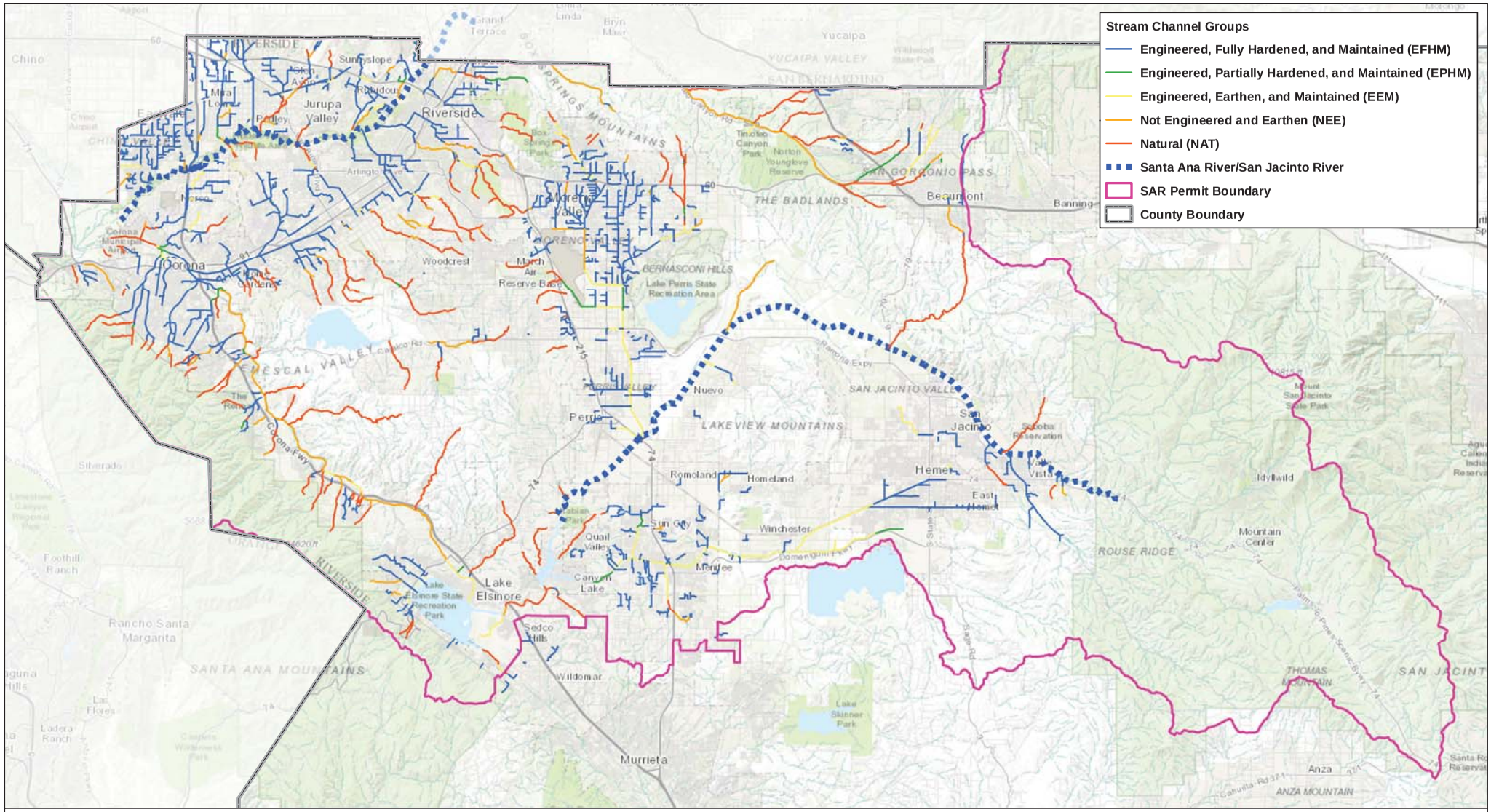
The goal of this study was to conduct a screening level analysis to identify and map stream channel segments that may be vulnerable to Hydromodification as required by the MS4 Permit. The purpose of mapping the susceptible stream channel segments was to develop a comprehensive map of the MS4 Permit area to assist the District, Co-Permittees, and project proponents to determine whether or not a project will drain to a potentially susceptible stream channel segment and may be subject to the HCOC requirements.

The study was divided into eight tasks:

1. Research and data collection;
2. Delineate and map existing stream channel segments;
3. Define and categorize groups of existing stream channel segments based on common characteristics;
4. Verify groups using provided data and site visits;
5. Identify an appropriate definition for an "engineered and regularly maintained" stream channel segment;
6. Conduct Susceptibility Assessment of the stream channels to identify segments that may be susceptible to Hydromodification;
7. Delineate and map existing hydrology watershed boundaries to stream channel segments that may be susceptible to Hydromodification; and
8. Create the comprehensive HCOC Applicability Map of the MS4 Permit area.

This report documents the methodologies used to determine whether an existing stream channel segment may be susceptible to Hydromodification due to future development. It discusses the delineation of the existing stream channel segments and the watershed areas in the MS4 Permit area. It also provides two

maps: Existing Stream Channel Delineation Map and HCOC Applicability Map as required by Sections II.G.10 and XII.B.4 of the MS4 Permit.


Stream Channel Groups
Engineered, Fully Hardened, and Maintained (EFHM)
Engineered, Partially Hardened, and Maintained (EPHM)
Engineered, Earthen, and Maintained (EEM)
Not Engineered and Earthen (NEE)
Natural (NAT)
Santa Ana River/San Jacinto River
SAR Permit Boundary
County Boundary
Riverside
Jurupa Valley
Corona
Norco
Eastvale
Mira Loma
Sunnyslope
Woodcrest
March Air Reserve Base
Moreno Valley
Perris
Nuevo
Lake Elsinore
Canyon Lake
Sedco Hills
Wildomar
Murrieta
Rancho Santa Margarita
Foothill Ranch
Ladera Ranch
Lake Forest
Sun City
Quail Valley
Menifee
Romoland
Homeland
Winchester
Hemet
East Hemet
San Jacinto
Idyllwild
Mountain Center
Banning
Beaumont
Yucaipa
SAN GORGONIO PASS
THE BADLANDS
BERNASCONI HILLS
LAKEVIEW MOUNTAINS
SAN JACINTO VALLEY
ROUSE RIDGE
SANTA ANA MOUNTAINS
ANZA MOUNTAIN
Anza
Lake Elsinore State Recreation Park
Lake Perris State Recreation Area
Lake Skinner Park
Soboba Reservation
Mount San Jacinto State Park
Box Spring Park
Tin Mine Canyon Park
Norton Younglove Reserve
Green River Golf Course
Temescal Canyon Regional Park
Cleveland National Forest
Cajalco Rd
Corona Expy
Ramona Expy
Domenigoni Pkwy
Sage Rd
Cahuilla Rd
Palomar Pines Scenic Byway
Pine Cove Rd
Santa Rosa Reservation
N
0
2.5
5
10
Miles
Revised February 2017
Existing Storm Drain / Watercourse Delineation Map
SAR Permittees
Map 1

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

BMP Name	Check One		If not applicable, state brief reason
	Included	Not Applicable	
Non-Structural Source Control BMPs			
Education for Property Owners, Operators, Tenants, Occupants, or Employees	X		
Activity Restrictions	X		
Irrigation System and Landscape Maintenance	X		
Common Area Litter Control	X		
Street Sweeping Private Streets and Parking Lots	X		
Drainage Facility Inspection and Maintenance	X		
Structural Source Control BMPs			
MS4 Stenciling and Signage	X		
Landscape and Irrigation System Design	X		
Protect Slopes and Channels	X		
Provide Community Car Wash Racks		X	Car Wash onsite is privately owned and operated
Properly Design:			
Fueling Areas	X		
Air/Water Supply Area Drainage	X		To be designed in final engineering.
Trash Storage Areas	X		
Loading Docks		X	No loading docks
Maintenance Bays		X	No maintenance bays
Vehicle and Equipment Wash Areas		X	No post construction wash areas
Outdoor Material Storage Areas	X		
Outdoor Work Areas or Processing Areas		X	No outdoor work areas or processing areas
Provide Wash Water Controls for Food Preparation Areas		X	No outdoor food preparation areas proposed

JUSTIFICATION

- *Education for Property Owners, Operators, Tenants, Occupants, or Employees*

The Developer/Owner will be responsible for implementation of this BMP. They will provide educational materials (examples shown in Appendix D) to the new tenants. These materials shall include general housekeeping practices that contribute to the protection of Urban Runoff quality. In addition, BMP training and education program will be provided and paid for by the Developer/Owner (landscape and maintenance crew). The training shall start no later than 6 months after the hire date.

- *Activity Restrictions*

Define activity restrictions regarding the protection of surface water quality. In particular, pesticide application in common areas must be performed by an applicator certified by the California Department of Pesticide Regulation.

The owner/developer and POA will be responsible for the maintenance of the project site. Frequency and level of maintenance and inspection will be based on these agencies' regulations and codes and be determined in part by this WQMP. Categories of maintenance and inspection shall include, but not limited to the following:

- *Irrigation System and Landscape Maintenance*
    - *Irrigation at the most efficient time, twice daily*
    - *Appropriate use of fertilizers and pesticides (according to manufacturers' minimum requirement and conforming with State requirements)*
    - *Sprinkler heads will be inspected every two weeks by the maintenance personnel for any leaks or other malfunction that can affect the quality of irrigation.*
    - *Inspection for trash and waste will be done along the curb inlets, parkways, and basins at least twice a year.*
- *Common Area Litter Control*

Any Trash bins and cans provided will need to be maintained by the owner/developer and POA. Collection of these bins will occur weekly. The owner/developer and POA is responsible for the cleaning and clearing of trash in the infiltration basin..

- *Drainage Facility Inspections and Maintenance*

The owner/Developer will be responsible for scheduling and implementing maintenance and cleaning of the infiltration basin. Removal of trash and debris from the basin to maintain proper functioning.

Appendix 10 includes copies of the educational materials that will be used in implementing this project-specific WQMP.

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

TO BE INCLUDED IN FINAL PROJECT SPECIFIC WATER QUALITY MANAGEMENT PLAN

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ A. **On-site storm drain inlets**	❑ **Locations of inlets.**	❑ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	❑ **Maintain and periodically repaint or replace inlet markings.** ☑ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ❑ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ❑ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
❑ B. **Interior floor drains and elevator shaft sump pumps**		❑ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**
❑ C. **Interior parking garages**		❑ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ D1. **Need for future indoor & structural pest control**		☐ **Note building design features that discourage entry of pests.**	☐ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☑ D2. **Landscape/ Outdoor Pesticide Use**	☐ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☐ **Show self-retaining landscape areas, if any.** ☐ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ☐ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☑ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ☐ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ☐ **Consider using pest-resistant plants, especially adjacent to hardscape.** **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☐ **Maintain landscaping using minimum or no pesticides.** ☑ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** ☐ **Provide IPM information to new owners, lessees and operators.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ E. **Pools, spas, ponds, decorative fountains, and other water features.**	❑ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	❑ **See applicable operational BMPs in** "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☑ F. **Food service**	❑ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ❑ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	❑ **Describe the location and features of the designated cleaning area.** ❑ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.** **PROVIDED DURING FINAL DESIGN**	❑ **See the brochure, "**The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ **Provide this brochure to new site owners, lessees, and operators.**
☑ G. **Refuse areas**	❑ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ❑ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ❑ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	❑ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ❑ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	❑ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ H. **Industrial processes.**	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ J. **Vehicle and Equipment Cleaning**	❑ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	❑ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ❑ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ❑**Car dealerships and similar may rinse cars with water only.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ K. **Vehicle/Equipment Repair and Maintenance**	❑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	❑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ❑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ❑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ❑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ L. **Fuel Dispensing Areas**	☐ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ☐ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**	**PROVIDED DURING FINAL DESIGN**	☐ **The property owner shall dry sweep the fueling area routinely.** ☐ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ M. **Loading Docks**	❑ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ❑ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ❑ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		❑ **Move loaded and unloaded items indoors as soon as possible.** ❑ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ N. **Fire Sprinkler Test Water**		❑ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	❑ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ❑ **Boiler drain lines** ❑ **Condensate drain lines** ❑ **Rooftop equipment** ❑ **Drainage sumps** ☑ **Roofing, gutters, and trim.** ❑ **Other sources**		❑ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ❑ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ❑ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ❑ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ❑ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** **Include controls for other sources as specified by local reviewer.**	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ P. **Plazas, sidewalks, and parking lots.**			☑ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

TO BE INCLUDED IN FINAL PROJECT SPECIFIC WATER QUALITY MANAGEMENT PLAN

Site Design & Landscape Planning SD-10

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.

- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.

- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.

- Promote natural vegetation by using parking lot islands and other landscaped areas.

- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.

- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11

Rain Garden

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Outdoor Work Areas SD-35

Photo Credit: Geoff Brosseau

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutant
- ☑ Collect and Convey

Description

Proper design of outdoor work areas for materials reduces opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system.

Approach

Outdoor work areas require a drainage approach different from the typical infiltration/detention strategy. In outdoor work areas, infiltration is discouraged; collection and conveyance are encouraged. In outdoor work areas, infiltration is discouraged and runoff is often routed directly to the sanitary sewer, not the storm drain. Because this runoff is being added to the loads normally received by the wastewater treatment plants, municipal stormwater programs and/or private developers must work with the local plant to develop solutions that minimize effects on the treatment facility. These concerns are best addressed in the planning and design stage of the outdoor work area.

Suitable Applications

Appropriate applications include residential, commercial, and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for outdoor work areas are governed by Building and Fire Codes, and by current local agency ordinances, and zoning requirements.

Designing New Installations

Outdoor work areas can be designed in particular ways to reduce impacts on both stormwater quality and sewage treatment plants.

- Create an impermeable surface such as concrete or asphalt, or a prefabricated metal drip pan, depending on the use.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Cover the area with a roof. This prevents rain from falling on the work area and becoming polluted runoff.
- Berm or perform mounding around the perimeter of the area to prevent water from adjacent areas from flowing on to the surface of the work area.
- Directly connect runoff. Unlike other areas, runoff from work areas is directly connected to the sanitary sewer or other specialized containment system(s). This allows the more highly concentrated pollutants from these areas to receive special treatment that removes particular constituents. Approval for this connection must be obtained from the appropriate sanitary sewer agency.
- Locate the work area away from storm drains or catch basins.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Outdoor Processing Areas SD-36

Description

Outdoor process equipment operations such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, landfills, waste piles, wastewater and solid waste treatment and disposal, and others operations may contribute a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the storm conveyance system.

Approach

Outdoor processing areas require a drainage approach different from the typical infiltration/detention strategy. In outdoor process equipment areas, infiltration is discouraged. Containment is encouraged, accompanied by collection and conveyance. Preventative measures include enclosures, secondary containment structures, dead-end sumps, and conveyance to treatment facilities in accordance with conditions established by the applicable sewer agency.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- ☑ Collect and Convey

Suitable Applications

Appropriate applications include commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for outdoor processing areas are governed by Building and Fire codes, and by current local agency ordinances, and zoning requirements.

Designing New Installations

Operations determined to be a potential threat to water quality should consider to the following recommendations:

- Cover or enclose areas that would be the most significant source of pollutants; or slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.
- Grade or berm area to prevent run-on from surrounding areas.
- Do not install storm drains in areas of equipment repair.
- Consider other features that are comparable or equally effective.
- Provide secondary containment structures (not double wall containers) where wet material processing occurs (e.g., electroplating), to hold spills resulting from accidents, leaking tanks, or equipment, or any other unplanned releases (Note:

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

if these are plumbed to the sanitary sewer, they must be with the prior approval of the sewering agency.)

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Infiltration Basin TC-11

Design Considerations

- Soil for Infiltration
- Slope
- Aesthetics

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend *(Removal Effectiveness)*

● Low ■ High

▲ Medium

Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

California Experience

Infiltration basins have a long history of use in California, especially in the Central Valley. Basins located in Fresno were among those initially evaluated in the National Urban Runoff Program and were found to be effective at reducing the volume of runoff, while posing little long-term threat to groundwater quality (EPA, 1983; Schroeder, 1995). Proper siting of these devices is crucial as underscored by the experience of Caltrans in siting two basins in Southern California. The basin with marginal separation from groundwater and soil permeability failed immediately and could never be rehabilitated.

Advantages

- Provides 100% reduction in the load discharged to surface waters.
- The principal benefit of infiltration basins is the approximation of pre-development hydrology during which a

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

significant portion of the average annual rainfall runoff is infiltrated and evaporated rather than flushed directly to creeks.

- If the water quality volume is adequately sized, infiltration basins can be useful for providing control of channel forming (erosion) and high frequency (generally less than the 2-year) flood events.

Limitations

- May not be appropriate for industrial sites or locations where spills may occur.
- Infiltration basins require a minimum soil infiltration rate of 0.5 inches/hour, not appropriate at sites with Hydrologic Soil Types C and D.
- If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated prior to infiltration to protect groundwater quality.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils.
- Upstream drainage area must be completely stabilized before construction.
- Difficult to restore functioning of infiltration basins once clogged.

Design and Sizing Guidelines

- Water quality volume determined by local requirements or sized so that 85% of the annual runoff volume is captured.
- Basin sized so that the entire water quality volume is infiltrated within 48 hours.
- Vegetation establishment on the basin floor may help reduce the clogging rate.

Construction/Inspection Considerations

- Before construction begins, stabilize the entire area draining to the facility. If impossible, place a diversion berm around the perimeter of the infiltration site to prevent sediment entrance during construction or remove the top 2 inches of soil after the site is stabililized. Stabilize the entire contributing drainage area, including the side slopes, before allowing any runoff to enter once construction is complete.
- Place excavated material such that it can not be washed back into the basin if a storm occurs during construction of the facility.
- Build the basin without driving heavy equipment over the infiltration surface. Any equipment driven on the surface should have extra-wide ("low pressure") tires. Prior to any construction, rope off the infiltration area to stop entrance by unwanted equipment.
- After final grading, till the infiltration surface deeply.
- Use appropriate erosion control seed mix for the specific project and location.

Performance

As water migrates through porous soil and rock, pollutant attenuation mechanisms include precipitation, sorption, physical filtration, and bacterial degradation. If functioning properly, this approach is presumed to have high removal efficiencies for particulate pollutants and moderate removal of soluble pollutants. Actual pollutant removal in the subsurface would be expected to vary depending upon site-specific soil types. This technology eliminates discharge to surface waters except for the very largest storms; consequently, complete removal of all stormwater constituents can be assumed.

There remain some concerns about the potential for groundwater contamination despite the findings of the NURP and Nightingale (1975; 1987a,b,c; 1989). For instance, a report by Pitt et al. (1994) highlighted the potential for groundwater contamination from intentional and unintentional stormwater infiltration. That report recommends that infiltration facilities not be sited in areas where high concentrations are present or where there is a potential for spills of toxic material. Conversely, Schroeder (1995) reported that there was no evidence of groundwater impacts from an infiltration basin serving a large industrial catchment in Fresno, CA.

Siting Criteria

The key element in siting infiltration basins is identifying sites with appropriate soil and hydrogeologic properties, which is critical for long term performance. In one study conducted in Prince George's County, Maryland (Galli, 1992), all of the infiltration basins investigated clogged within 2 years. It is believed that these failures were for the most part due to allowing infiltration at sites with rates of less than 0.5 in/hr, basing siting on soil type rather than field infiltration tests, and poor construction practices that resulted in soil compaction of the basin invert.

A study of 23 infiltration basins in the Pacific Northwest showed better long-term performance in an area with highly permeable soils (Hilding, 1996). In this study, few of the infiltration basins had failed after 10 years. Consequently, the following guidelines for identifying appropriate soil and subsurface conditions should be rigorously adhered to.

- Determine soil type (consider RCS soil type 'A, B or C' only) from mapping and consult USDA soil survey tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30% clay or more than 40% of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.

- Groundwater separation should be at least 3 m from the basin invert to the measured ground water elevation. There is concern at the state and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.

- Location away from buildings, slopes and highway pavement (greater than 6 m) and wells and bridge structures (greater than 30 m). Sites constructed of fill, having a base flow or with a slope greater than 15% should not be considered.

- Ensure that adequate head is available to operate flow splitter structures (to allow the basin to be offline) without ponding in the splitter structure or creating backwater upstream of the splitter.

- Base flow should not be present in the tributary watershed.

Secondary Screening Based on Site Geotechnical Investigation

- At least three in-hole conductivity tests shall be performed using USBR 7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered within the boring), two tests at different locations within the proposed basin and the third down gradient by no more than approximately 10 m. The tests shall measure permeability in the side slopes and the bed within a depth of 3 m of the invert.

- The minimum acceptable hydraulic conductivity as measured in any of the three required test holes is 13 mm/hr. If any test hole shows less than the minimum value, the site should be disqualified from further consideration.

- Exclude from consideration sites constructed in fill or partially in fill unless no silts or clays are present in the soil boring. Fill tends to be compacted, with clays in a dispersed rather than flocculated state, greatly reducing permeability.

- The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Additional Design Guidelines

(1) Basin Sizing - The required water quality volume is determined by local regulations or sufficient to capture 85% of the annual runoff.

(2) Provide pretreatment if sediment loading is a maintenance concern for the basin.

(3) Include energy dissipation in the inlet design for the basins. Avoid designs that include a permanent pool to reduce opportunity for standing water and associated vector problems.

(4) Basin invert area should be determined by the equation:

$$A = \frac{WQV}{kt}$$

where A = Basin invert area (m^2)

WQV = water quality volume (m^3)

k = 0.5 times the lowest field-measured hydraulic conductivity (m/hr)

t = drawdown time (48 hr)

(5) The use of vertical piping, either for distribution or infiltration enhancement shall not be allowed to avoid device classification as a Class V injection well per 40 CFR146.5(e)(4).

Maintenance

Regular maintenance is critical to the successful operation of infiltration basins. Recommended operation and maintenance guidelines include:

- Inspections and maintenance to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.
- Observe drain time for the design storm after completion or modification of the facility to confirm that the desired drain time has been obtained.
- Schedule semiannual inspections for beginning and end of the wet season to identify potential problems such as erosion of the basin side slopes and invert, standing water, trash and debris, and sediment accumulation.
- Remove accumulated trash and debris in the basin at the start and end of the wet season.
- Inspect for standing water at the end of the wet season.
- Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.
- Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of the basin.
- If erosion is occurring within the basin, revegetate immediately and stabilize with an erosion control mulch or mat until vegetation cover is established.
- To avoid reversing soil development, scarification or other disturbance should only be performed when there are actual signs of clogging, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a very light tractor.

Cost

Infiltration basins are relatively cost-effective practices because little infrastructure is needed when constructing them. One study estimated the total construction cost at about $2 per ft (adjusted for inflation) of storage for a 0.25-acre basin (SWRPC, 1991). As with other BMPs, these published cost estimates may deviate greatly from what might be incurred at a specific site. For instance, Caltrans spent about $18/ft^3 for the two infiltration basins constructed in southern California, each of which had a water quality volume of about 0.34 ac.-ft. Much of the higher cost can be attributed to changes in the storm drain system necessary to route the runoff to the basin locations.

Infiltration basins typically consume about 2 to 3% of the site draining to them, which is relatively small. Additional space may be required for buffer, landscaping, access road, and fencing. Maintenance costs are estimated at 5 to 10% of construction costs.

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly maintained, infiltration basins have a high failure rate. Thus, it may be necessary to replace the basin with a different technology after a relatively short period of time.

References and Sources of Additional Information

Caltrans, 2002, BMP Retrofit Pilot Program Proposed Final Report, Rpt. CTSW-RT-01-050, California Dept. of Transportation, Sacramento, CA.

Galli, J. 1992. *Analysis of Urban BMP Performance and Longevity in Prince George's County, Maryland*. Metropolitan Washington Council of Governments, Washington, DC.

Hilding, K. 1996. Longevity of infiltration basins assessed in Puget Sound. *Watershed Protection Techniques* 1(3):124–125.

Maryland Department of the Environment (MDE). 2000. *Maryland Stormwater Design Manual*. http://www.mde.state.md.us/environment/wma/stormwatermanual. Accessed May 22, 2002.

Metzger, M. E., D. F. Messer, C. L. Beitia, C. M. Myers, and V. L. Kramer. 2002. The Dark Side Of Stormwater Runoff Management: Disease Vectors Associated With Structural BMPs. Stormwater 3(2): 24-39.

Nightingale, H.I., 1975, "Lead, Zinc, and Copper in Soils of Urban Storm-Runoff Retention Basins," American Water Works Assoc. Journal. Vol. 67, p. 443-446.

Nightingale, H.I., 1987a, "Water Quality beneath Urban Runoff Water Management Basins," Water Resources Bulletin, Vol. 23, p. 197-205.

Nightingale, H.I., 1987b, "Accumulation of As, Ni, Cu, and Pb in Retention and Recharge Basin Soils from Urban Runoff," Water Resources Bulletin, Vol. 23, p. 663-672.

Nightingale, H.I., 1987c, "Organic Pollutants in Soils of Retention/Recharge Basins Receiving Urban Runoff Water," Soil Science Vol. 148, pp. 39-45.

Nightingale, H.I., Harrison, D., and Salo, J.E., 1985, "An Evaluation Technique for Ground-water Quality Beneath Urban Runoff Retention and Percolation Basins," Ground Water Monitoring Review, Vol. 5, No. 1, pp. 43-50.

Oberts, G. 1994. Performance of Stormwater Ponds and Wetlands in Winter. *Watershed Protection Techniques* 1(2): 64–68.

Pitt, R., et al. 1994, *Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration*, EPA/600/R-94/051, Risk Reduction Engineering Laboratory, U.S. EPA, Cincinnati, OH.

Schueler, T. 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*. Metropolitan Washington Council of Governments, Washington, DC.

Schroeder, R.A., 1995, *Potential For Chemical Transport Beneath a Storm-Runoff Recharge (Retention) Basin for an Industrial Catchment in Fresno, CA*, USGS Water-Resource Investigations Report 93-4140.

Southeastern Wisconsin Regional Planning Commission (SWRPC). 1991. *Costs of Urban Nonpoint Source Water Pollution Control Measures*. Southeastern Wisconsin Regional Planning Commission, Waukesha, WI.

U.S. EPA, 1983, *Results of the Nationwide Urban Runoff Program: Volume 1 – Final Report*, WH-554, Water Planning Division, Washington, DC.

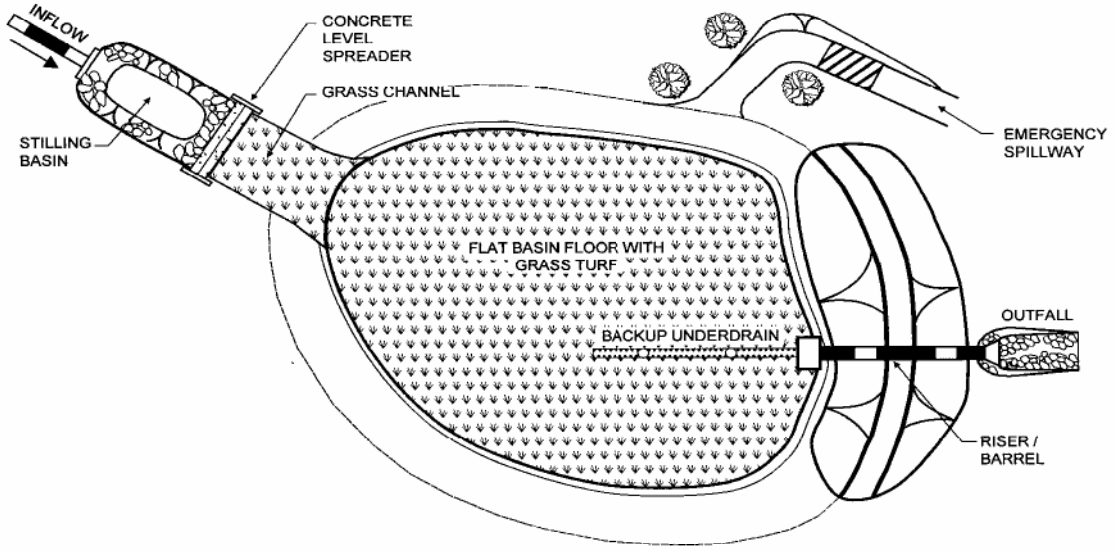
Watershed Management Institute (WMI). 1997. *Operation, Maintenance, and Management of Stormwater Management Systems*. Prepared for U.S. Environmental Protection Agency Office of Water, Washington, DC.

Information Resources

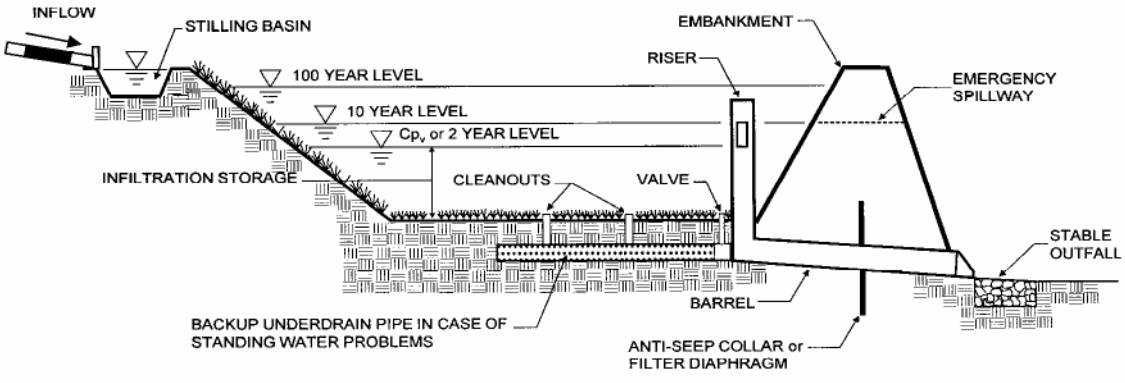
Center for Watershed Protection (CWP). 1997. *Stormwater BMP Design Supplement for Cold Climates*. Prepared for U.S. Environmental Protection Agency Office of Wetlands, Oceans and Watersheds. Washington, DC.

Ferguson, B.K., 1994. *Stormwater Infiltration*. CRC Press, Ann Arbor, MI.

USEPA. 1993. *Guidance to Specify Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. EPA-840-B-92-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.



PLAN VIEW



PROFILE

Non-Stormwater Discharges SC-10

Graphic by: Margie Winter

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. For municipalities non-stormwater discharges present themselves in two situations. One is from fixed facilities owned and/or operated by the municipality. The other situation is non-stormwater discharges that are discovered during the normal operation of a field program. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, and surface cleaning. However, there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances (such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants) into storm drains. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges.

Approach

The municipality must address non-stormwater discharges from its fixed facilities by assessing the types of non-stormwater discharges and implementing BMPs for the discharges determined to pose environmental concern. For field programs

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

the field staff must be trained to now what to look for regarding non-stormwater discharges and the procedures to follow in investigating the detected discharges.

Suggested Protocols

Fixed Facility

General

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Landscaping and beautification efforts of hot spots might also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.

Illicit Connections

- Locate discharges from the fixed facility drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Use techniques such as smoke testing, dye testing and television camera inspection (as noted below) to verify physical connections.
- Isolate problem areas and plug illicit discharge points.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for several days following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- Review the "as-built" piping schematic as a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.

- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Storm Sewer

- TV Cameras can be employed to visually identify illicit connections to the fixed facility storm drain system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Clean up spills on paved surfaces with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- See fact sheet SC-11 Spill Prevention, Control, and Clean Up.

Field Program

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially ones that involve more than one jurisdiction and those that are not classified as hazardous, which are often not responded to as effectively as they need to be.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- See SC-74 Stormwater Drainage System Maintenance for additional information.

Field Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- During routine field program maintenance field staff should look for evidence of illegal discharges or illicit connection:
  - Is there evidence of spills such as paints, discoloring, etc.
  - Are there any odors associated with the drainage system
  - Record locations of apparent illegal discharges/illicit connections and notify appropriate investigating agency.
- If trained, conduct field investigation of non-stormwater discharges to determine whether they pose a threat to water quality.

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms.
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms

- Educational materials

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any onsite drainage points observed.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Enforcement

- Educate the responsible party if identified on the impacts of their actions, explain the stormwater requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Initiate follow-up and/or enforcement procedures.
- If an illegal discharge is traced to a commercial, residential or industrial source, conduct the following activities or coordinate the following activities with the appropriate agency:
  - Contact the responsible party to discuss methods of eliminating the non-stormwater discharge, including disposal options, recycling, and possible discharge to the sanitary sewer (if within POTW limits).
  - Provide information regarding BMPs to the responsible party, where appropriate.
  - Begin enforcement procedures, if appropriate.
  - Continue inspection and follow-up activities until the illicit discharge activity has ceased.
- If an illegal discharge is traced to a commercial or industrial activity, coordinate information on the discharge with the jurisdiction's commercial and industrial facility inspection program.

Training

- Train technical staff to identify and document illegal dumping incidents.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Train employees to identify non-stormwater discharges and report them to the appropriate departments.
- Train staff who have the authority to conduct surveillance and inspections, and write citations for those caught illegally dumping.

- Train municipal staff responsible for surveillance and inspection in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and federal OSHA 29 CFR 1910.146).
  - Procedural training (field screening, sampling, smoke/dye testing, TV inspection).
- Educate the identified responsible party on the impacts of his or her actions.

Spill Response and Prevention

- See SC-11 Spill Prevention Control and Clean Up

Other Considerations

- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The cost of fees for dumping at a proper waste disposal facility are often more than the fine for an illegal dumping offense, thereby discouraging people from complying with the law. The absence of routine or affordable pickup service for trash and recyclables in some communities also encourages illegal dumping. A lack of understanding regarding applicable laws or the inadequacy of existing laws may also contribute to the problem.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Many facilities do not have accurate, up-to-date schematic drawings.
- Can be difficult to locate illicit connections especially if there is groundwater infiltration.

Requirements

Costs

- Eliminating illicit connections can be expensive especially if structural modifications are required such re-plumbing cross connections under an existing slab.
- Minor cost to train field crews regarding the identification of non-stormwater discharges. The primary cost is for a fully integrated program to identify and eliminate illicit connections and illegal dumping. However, by combining with other municipal programs (i.e. pretreatment program) cost may be lowered.
- Municipal cost for containment and disposal may be borne by the discharger.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Current municipal NPDES permits require municipalities to effectively prohibit non-stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non-stormwater discharges are typically allowed:
  - Diverted stream flows;
  - Rising found waters;
  - Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
  - Uncontaminated pumped ground water;
  - Foundation drains;
  - Springs;
  - Water from crawl space pumps;
  - Footing drains;
  - Air conditioning condensation;
  - Flows from riparian habitats and wetlands;
  - Water line and hydrant flushing ;
  - Landscape irrigation;
  - Planned and unplanned discharges from potable water sources;
  - Irrigation water;
  - Individual residential car washing; and
  - Lawn watering.

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Illegal Dumping

- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties

Outreach

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people on the street who are aware of the problem and who have the tools to at least identify the incident, if not correct it. There we a number of ways of accomplishing this:

- Train municipal staff from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report the incidents.
- Deputize municipal staff who may come into contact with illegal dumping with the authority to write illegal dumping tickets for offenders caught in the act (see below).
- Educate the public. As many as 3 out of 4 people do not understand that in most communities the storm drain does not go to the wastewater treatment plant. Unfortunately, with the heavy emphasis in recent years on public education about solid waste management, including recycling and household hazardous waste, the sewer system (both storm and sanitary) has been the likely recipient of cross-media transfers of waste.
- Provide the public with a mechanism for reporting incidents such as a hot line and/or door hanger (see below).
- Help areas where incidents occur more frequently set up environmental watch programs (like crime watch programs).
- Train volunteers to notice and report the presence and suspected source of an observed pollutant to the appropriate public agency.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Current municipal NPDES permits require municipalities to effectively prohibit non-stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non-stormwater discharges are typically allowed:
  - Diverted stream flows;
  - Rising found waters;
  - Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
  - Uncontaminated pumped ground water;
  - Foundation drains;
  - Springs;
  - Water from crawl space pumps;
  - Footing drains;
  - Air conditioning condensation;
  - Flows from riparian habitats and wetlands;
  - Water line and hydrant flushing ;
  - Landscape irrigation;
  - Planned and unplanned discharges from potable water sources;
  - Irrigation water;
  - Individual residential car washing; and
  - Lawn watering.

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence

of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Storm Drain Stenciling

- Stencil storm drain inlets with a message to prohibit illegal dumpings, especially in areas with waste handling facilities.
- Encourage public reporting of improper waste disposal by a HOTLINE number stenciled onto the storm drain inlet.
- See Supplemental Information section of this fact sheet for further detail on stenciling program approach.

Oil Recycling

- Contract collection and hauling of used oil to a private licensed used oil hauler/recycler.
- Comply with all applicable state and federal regulations regarding storage, handling, and transport of petroleum products.
- Create procedures for collection such as; collection locations and schedule, acceptable containers, and maximum amounts accepted.
- The California Integrated Waste Management Board has a Recycling Hotline, (800) 553-2962, that provides information and recycling locations for used oil.

Household Hazardous Waste

- Provide household hazardous waste (HHW) collection facilities. Several types of collection approaches are available including permanent, periodic, or mobile centers, curbside collection, or a combination of these systems.

Training

- Train municipal employees and contractors in proper and consistent methods for waste disposal.
- Train municipal employees to recognize and report illegal dumping.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Federal Regulations (RCRA, SARA, CERCLA) and state regulations exist regarding the disposal of hazardous waste.
- Municipalities are required to have a used oil recycling element and a HHW element within their integrated waste management plan.
- Significant liability issues are involved with the collection, handling, and disposal of HHW.

Examples

The City of Palo Alto has developed a public participation program for reporting dumping violations. When a concerned citizen or public employee encounters evidence of illegal dumping, a door hanger (similar in format to hotel "Do Not Disturb" signs) is placed on the front doors in the neighborhood. The door hanger notes that a violation has occurred in the neighborhood, informs the reader why illegal dumping is a problem, and notes that illegal dumping carries a significant financial penalty. Information is also provided on what citizens can do as well as contact numbers for more information or to report a violation.

The Port of Long Beach has a state of the art database incorporating storm drain infrastructure, potential pollutant sources, facility management practices, and a pollutant tracking system.

The State Department of Fish and Game has a hotline for reporting violations called CalTIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).

The California Department of Toxic Substances Control's Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

References and Resources

http://www.stormwatercenter.net/

California's Nonpoint Source Program Plan http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program,
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program
(http://www.projectcleanwater.org)

Santa Clara Valley Urban Runoff Pollution Prevention Program
http://www.scvurppp-w2k.com/pdf%20documents/PS_ICID.PDF

Spill Prevention, Control & Cleanup SC-11

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Spills and leaks, if not properly controlled, can adversely impact the storm drain system and receiving waters. Due to the type of work or the materials involved, many activities that occur either at a municipal facility or as a part of municipal field programs have the potential for accidental spills and leaks. Proper spill response planning and preparation can enable municipal employees to effectively respond to problems when they occur and minimize the discharge of pollutants to the environment.

Targeted Constituents

Sediment	
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

- An effective spill response and control plan should include:
  - Spill/leak prevention measures;
  - Spill response procedures;
  - Spill cleanup procedures;
  - Reporting; and
  - Training
- A well thought out and implemented plan can prevent pollutants from entering the storm drainage system and can be used as a tool for training personnel to prevent and control future spills as well.

Pollution Prevention

- Develop and implement a Spill Prevention Control and Response Plan. The plan should include:

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- A description of the facility, the address, activities and materials involved
- Identification of key spill response personnel
- Identification of the potential spill areas or operations prone to spills/leaks
- Identification of which areas should be or are bermed to contain spills/leaks
- Facility map identifying the key locations of areas, activities, materials, structural BMPs, etc.
- Material handling procedures
- Spill response procedures including:
  - Assessment of the site and potential impacts
  - Containment of the material
  - Notification of the proper personnel and evacuation procedures
  - Clean up of the site
  - Disposal of the waste material and
  - Proper record keeping

- Product substitution – use less toxic materials (i.e. use water based paints instead of oil based paints)
- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of materials that are brought into the facility or into the field.

Suggested Protocols

Spill/Leak Prevention Measures

- If possible, move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain can not come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.

- Store, contain and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For field programs, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard where leaks and spill are easier to control.
- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all of the water will be collected and disposed of properly.
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that if a spill occurs, the material will be contained.

Training

- Educate employees about spill prevention, spill response and cleanup on a routine basis.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - The employees should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan if one is available.
- Training of staff from all municipal departments should focus on recognizing and reporting potential or current spills/leaks and who they should contact.
- Employees responsible for aboveground storage tanks and liquid transfers for large bulk containers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

Spill Response and Prevention

- Identify key spill response personnel and train employees on who they are.
- Store and maintain appropriate spill cleanup materials in a clearly marked location near storage areas; and train employees to ensure familiarity with the site's spill control plan and/or proper spill cleanup procedures.
- Locate spill cleanup materials, such as absorbents, where they will be readily accessible (e.g. near storage and maintenance areas, on field trucks).

SC-11 Spill Prevention, Control & Cleanup

- Follow the Spill Prevention Control and Countermeasure Plan if one is available.
- If a spill occurs, notify the key spill response personnel immediately. If the material is unknown or hazardous, the local fire department may also need to be contacted.
- If safe to do so, attempt to contain the material and block the nearby storm drains so that the area impacted is minimized. If the material is unknown or hazardous wait for properly trained personnel to contain the materials.
- Perform an assessment of the area where the spill occurred and the downstream area that it could impact. Relay this information to the key spill response and clean up personnel.

Spill Cleanup Procedures

- Small non-hazardous spills
  - Use a rag, damp cloth or absorbent materials for general clean up of liquids
  - Use brooms or shovels for the general clean up of dry materials
  - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
  - Dispose of any waste materials properly
  - Clean or dispose of any equipment used to clean up the spill properly
- Large non-hazardous spills
  - Use absorbent materials for general clean up of liquids
  - Use brooms, shovels or street sweepers for the general clean up of dry materials
  - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
  - Dispose of any waste materials properly
  - Clean or dispose of any equipment used to clean up the spill properly
- For hazardous or very large spills, a private cleanup company or Hazmat team may need to be contacted to assess the situation and conduct the cleanup and disposal of the materials.
- Chemical cleanups of material can be achieved with the use of absorbents, gels, and foams. Remove the adsorbent materials promptly and dispose of according to regulations.
- If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

Reporting

- Report any spills immediately to the identified key municipal spill response personnel.

- Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to the Office of Emergency Service (OES)
- Spills that pose an immediate threat to human health or the environment may also need to be reported within 24 hours to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour)
- After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file (see the section on Reporting below). The incident may also be used in briefing staff about proper procedures

Other Considerations

- State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure Plan (SPCC) Plan (Health & Safety Code Chapter 6.67).
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, if permitted to do so, prohibiting any hard connections to the storm drain.

Requirements

Costs

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of wastes, contaminated soil and water is very expensive

Maintenance

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the response and containment of a spill. A good record keeping system helps the municipality minimize incident recurrence, correctly respond with appropriate containment and cleanup activities, and comply with legal requirements.

A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm drain.

These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Examples

The City of Palo Alto includes spill prevention and control as a major element of its highly effective program for municipal vehicle maintenance shops.

References and Resources

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Waste Handling & Disposal SC-34

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runon and runoff.

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

Pollution Prevention

- Reduction in the amount of waste generated can be accomplished using the following source controls such as:
  - Production planning and sequencing
  - Process or equipment modification
  - Raw material substitution or elimination
  - Loss prevention and housekeeping
  - Waste segregation and separation
  - Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Suggested Protocols

General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater runon and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage or leaks regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Place waste containers under cover if possible.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be

disposed of in solid waste containers (see chemical/ hazardous waste collection section below).

- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping

- Use all of the product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g. sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Stencil storm drains on the facility's property with prohibitive message regarding waste disposal.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers protected from vandalism, and in compliance with fire and hazardous waste codes.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.

Runon/Runoff Prevention

- Prevent stormwater runon from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent the waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropyleneor hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Inspection

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Training

- Train staff pollution prevention measures and proper disposal methods.
- Train employees and contractors proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.
- Vehicles transporting waste should have spill prevention equipment that can prevent spills during transport. The spill prevention equipment includes:
  - Vehicles equipped with baffles for liquid waste
  - Trucks with sealed gates and spill guards for solid waste

Other Considerations

- Hazardous waste cannot be re-used or recycled; it must be disposed of by a licensed hazardous waste hauler.

Requirements

Costs

- Capital and operation and maintenance costs will vary substantially depending on the size of the facility and the types of waste handled. Costs should be low if there is an inventory program in place.

Maintenance

- None except for maintaining equipment for material tracking program.

Supplemental Information

Further Detail of the BMP

Land Treatment System

- Minimize the runoff of polluted stormwater from land application of municipal waste on-site by:
  - Choosing a site where slopes are under 6%, the soil is permeable, there is a low water table, it is located away from wetlands or marshes, there is a closed drainage system.
  - Avoiding application of waste to the site when it is raining or when the ground is saturated with water.
  - Growing vegetation on land disposal areas to stabilize soils and reduce the volume of surface water runoff from the site.
  - Maintaining adequate barriers between the land application site and the receiving waters. Planted strips are particularly good.
  - Using erosion control techniques such as mulching and matting, filter fences, straw bales, diversion terracing, and sediment basins.
  - Performing routine maintenance to ensure the erosion control or site stabilization measures are working.

References and Resources

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Associations (BASMAA). On-line: http://www.basmaa.org

Building & Grounds Maintenance SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, and abnormal pH. Utilizing the following protocols will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.
- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in he catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.

Landscaping Activities

- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the state.
- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-stormwater discharge.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.
- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water; do not put it in the storm drain, pour over landscaped areas.
- Use hand or mechanical weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Follow manufacturers' recommendations and label directions. Pesticides must never be applied if precipitation is occuring or predicted. Do not apply insecticides within 100 feet of surface waters such as lakes, ponds, wetlands, and streams.
- Use less toxic pesticides that will do the job, whenever possible. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.

- Apply pesticides only when wind speeds are low.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Overall costs should be low in comparison to other BMPs.

Maintenance

- Sweep paved areas regularly to collect loose particles, and wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping but it is subject to rusting and results in lower quality water. Initially the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time, typically a year, between flushes and may accumulate iron, manganese, lead, copper, nickel and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASSMA) http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) http://www.basmaa.org/

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Parking/Storage Area Maintenance SC-43

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The following protocols are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook).
- Keep accurate maintenance logs to evaluate BMP implementation.

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel and dispose of litter in the trash.

Surface cleaning

- Use dry cleaning methods (e.g. sweeping or vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- If water is used follow the procedures below:
  - Block the storm drain or contain runoff.
  - Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface, do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- When cleaning heavy oily deposits:
  - Use absorbent materials on oily spots prior to sweeping or washing.
  - Dispose of used absorbents appropriately.

Surface Repair

- Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination form contacting stormwater runoff.
- Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc., where applicable. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of the parking facilities and stormwater conveyance systems associated with them on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, nad implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

Requirements

Costs

Cleaning/sweeping costs can be quite large, construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities on a regular basis to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

SC-43 Parking/Storage Area Maintenance

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination form contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Use only as much water as necessary for dust control, to avoid runoff.

References and Resources

http://www.stormwatercenter.net/

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) http://www.basma.org

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Housekeeping Practices SC-60

Description

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products, and swimming pool chemicals. Related information is provided in BMP fact sheets SC-11 Spill Prevention, Control & Cleanup and SC-34 Waste Handling & Disposal.

Approach

Pollution Prevention

- Purchase only the amount of material that will be needed for foreseeable use. In most cases this will result in cost savings in both purchasing and disposal. See SC-61 Safer Alternative Products for additional information.
- Be aware of new products that may do the same job with less environmental risk and for less or the equivalent cost. Total cost must be used here; this includes purchase price, transportation costs, storage costs, use related costs, clean up costs and disposal costs.

Suggested Protocols

General

- Keep work sites clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Dispose of wash water, sweepings, and sediments, properly.
- Recycle or dispose of fluids properly.
- Establish a daily checklist of office, yard and plant areas to confirm cleanliness and adherence to proper storage and security. Specific employees should be assigned specific inspection responsibilities and given the authority to remedy any problems found.
- Post waste disposal charts in appropriate locations detailing for each waste its hazardous nature (poison, corrosive, flammable), prohibitions on its disposal (dumpster, drain, sewer) and the recommended disposal method (recycle, sewer, burn, storage, landfill).
- Summarize the chosen BMPs applicable to your operation and post them in appropriate conspicuous places.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Require a signed checklist from every user of any hazardous material detailing amount taken, amount used, amount returned and disposal of spent material.
- Do a before audit of your site to establish baseline conditions and regular subsequent audits to note any changes and whether conditions are improving or deteriorating.
- Keep records of water, air and solid waste quantities and quality tests and their disposition.
- Maintain a mass balance of incoming, outgoing and on hand materials so you know when there are unknown losses that need to be tracked down and accounted for.
- Use and reward employee suggestions related to BMPs, hazards, pollution reduction, work place safety, cost reduction, alternative materials and procedures, recycling and disposal.
- Have, and review regularly, a contingency plan for spills, leaks, weather extremes etc. Make sure all employees know about it and what their role is so that it comes into force automatically.

Training

- Train all employees, management, office, yard, manufacturing, field and clerical in BMPs and pollution prevention and make them accountable.
- Train municipal employees who handle potentially harmful materials in good housekeeping practices.
- Train personnel who use pesticides in the proper use of the pesticides. The California Department of Pesticide Regulation license pesticide dealers, certify pesticide applicators and conduct onsite inspections.
- Train employees and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and Countermeasure (SPCC) plant up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- There are no major limitations to this best management practice.
- There are no regulatory requirements to this BMP. Existing regulations already require municipalities to properly store, use, and dispose of hazardous materials

Requirements

Costs

- Minimal cost associated with this BMP. Implementation of good housekeeping practices may result in cost savings as these procedures may reduce the need for more costly BMPs.

Maintenance

- Ongoing maintenance required to keep a clean site. Level of effort is a function of site size and type of activities.

Supplemental Information

Further Detail of the BMP

- The California Integrated Waste Management Board's Recycling Hotline, 1-800-553-2962, provides information on household hazardous waste collection programs and facilities.

Examples

There are a number of communities with effective programs. The most pro-active include Santa Clara County and the City of Palo Alto, the City and County of San Francisco, and the Municipality of Metropolitan Seattle (Metro).

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000.
http://www.nalms.org/bclss/bmphome.html#bmp

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities, Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, Revised by California Coastal Commission, February 2002.

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Mateo STOPPP - (http://stoppp.tripod.com/bmp.html)

Plaza and Sidewalk Cleaning SC-71

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use. This fact sheet describes good housekeeping practices that can be incorporated into the municipality's existing cleaning and maintenance program.

Approach

Pollution Prevention

- Use dry cleaning methods whenever practical for surface cleaning activities.
- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal).

Suggested Protocols

Surface Cleaning

- Regularly broom (dry) sweep sidewalk, plaza and parking lot areas to minimize cleaning with water.
- Dry cleanup first (sweep, collect, and dispose of debris and trash) when cleaning sidewalks or plazas, then wash with or without soap.
- Block the storm drain or contain runoff when cleaning with water. Discharge wash water to landscaping or collect water and pump to a tank or discharge to sanitary sewer if allowed. (Permission may be required from local sanitation district.)

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Block the storm drain or contain runoff when washing parking areas, driveways or drive-throughs. Use absorbents to pick up oil; then dry sweep. Clean with or without soap. Collect water and pump to a tank or discharge to sanitary sewer if allowed. Street Repair and Maintenance.

Graffiti Removal

- Avoid graffiti abatement activities during rain events.
- Implement the procedures under Painting and Paint Removal in SC-70 Roads, Streets, and Highway Operation and Maintenance fact sheet when graffiti is removed by painting over.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a dirt or landscaped area after treating with an appropriate filtering device.
- Plug nearby storm drain inlets and vacuum/pump wash water to the sanitary sewer if authorized to do so if a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound). Ensure that a non-hazardous cleaning compound is used or dispose as hazardous waste, as appropriate.

Surface Removal and Repair

- Schedule surface removal activities for dry weather if possible.
- Avoid creating excess dust when breaking asphalt or concrete.
- Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. place hay bales or sand bags around inlets). Clean afterwards by sweeping up as much material as possible.
- Designate an area for clean up and proper disposal of excess materials.
- Remove and recycle as much of the broken pavement as possible to avoid contact with rainfall and stormwater runoff.
- When making saw cuts in pavement, use as little water as possible. Cover each storm drain inlet completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site.
- Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Wash water should be directed to landscaping or collected and pumped to the sanitary sewer if allowed.

Concrete Installation and Repair

- Schedule asphalt and concrete activities for dry weather.

- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place san bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- Protect applications of fresh concrete from rainfall and runoff until the material has dried.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.
- Clean parking lots on a regular basis with a street sweeper.

Training

- Provide regular training to field employees and/or contractors regarding surface cleaning and proper operation of equipment.
- Train employee and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include current sweeper technology to remove oil and grease.
- Surface cleaning activities that require discharges to the local sewering agency will require coordination with the agency.
- Arrangements for disposal of the swept material collected must be made, as well as accurate tracking of the areas swept and the frequency of sweeping.

Requirements

Costs

- The largest expenditures for sweeping and cleaning of sidewalks, plazas, and parking lots are in staffing and equipment. Sweeping of these areas should be incorporated into street sweeping programs to reduce costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Community education, such as informing residents about their options for recycling and waste disposal, as well as the consequences of littering, can instill a sense of citizen responsibility and potentially reduce the amount of maintenance required by the municipality.

Additional BMPs that should be considered for parking lot areas include:

- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Structural BMPs such as storm drain inlet filters can be very effective in reducing the amount of pollutants discharged from parking facilities during periods of rain.

References and Resources

Bay Area Stormwater Management Agencies Association (BASMAA). 1996. Pollution From Surface Cleaning Folder http://www.basmaa.org

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

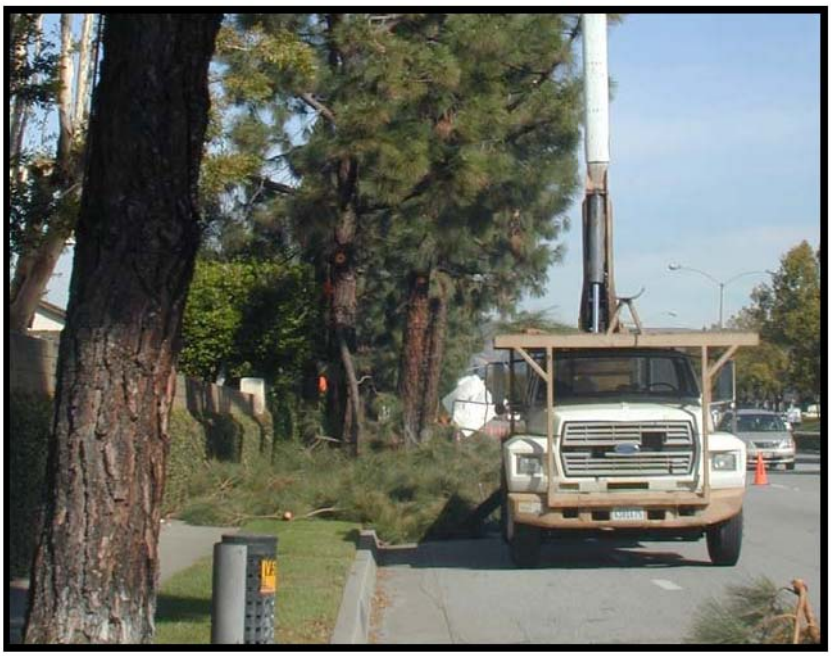
Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. Maintenance Best Management Practices for the Construction Industry. Brochures: Landscaping, Gardening, and Pool; Roadwork and Paving; and Fresh Concrete and Mortar Application. June 2001.

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Plan. 2001. Municipal Activities Model Program Guidance. November.

Landscape Maintenance SC-73



Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☑

Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols

Mowing, Trimming, and Weeding

- Whenever possible use mechanical methods of vegetation removal (e.g mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
  - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
  - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
  - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
  - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
  - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
  - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
  - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a know in location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Waste Management

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities http://ladpw.org/wmd/npdes/model_links.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm

Waste Handling and Disposal SC-75

Objectives

- Cover
- Contain
- Educate
- Reduce/Reuse

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

It is important to control litter to eliminate trash and other materials in stormwater runoff. Waste reduction is a major component of waste management and should be encouraged through training and public outreach. Management of waste once it is collected may involve reuse, recycling, or proper disposal.

Approach

Pollution Prevention

- Reuse products when possible.
- Encourage recycling programs with recycling bins, used oil collection, etc.

Suggested Protocols

Solid Waste Collection

- Implement procedures, where applicable, to collect, transport, and dispose of solid waste at appropriate disposal facilities in accordance with applicable federal, state, and local laws and regulations.
- Include properly designed trash storage areas. If feasible provide cover over trash storage areas.
- Regularly inspect solid waste containers for structural damage. Repair or replace damaged containers as necessary.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.
- Refer to SC-34 Waste Handling and Disposal for more information regarding solid waste facilities.

Waste Reduction and Recycling

- Recycle wastes whenever possible. Many types of waste can be recycled, recycling options for each waste type are limited. All gasoline, antifreeze, waste oil, and lead-acid batteries can be recycled. Latex and oil-based paint can be reused, as well as recycled. Materials that cannot be reused or recycled should either be incinerated or disposed of at a properly permitted landfill.
- Recycling is always preferable to disposal of unwanted materials.
- Recycling bins for glass, metal, newspaper, plastic bottles and other recyclable household solid wastes should be provided at public facilities and/or for residential curbside collection.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Clean out and cover litter receptacles frequently to prevent spillage.

Illegal Dumping

Substances illegally dumped on streets and into the storm drain system and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clipping, and pet wastes.

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Landscaping and beautification efforts of hot spots might also discourage future dumping.
- See SC-74 Drainage System Maintenance, and SC-10 Non-Stormwater Discharges.

Requirements

Costs

- The costs for a solid waste source control program vary depending on the type of method. The cost of a community education program or a plan to increase the number of trash receptacles can be very minimal. Costs for structural controls such as trash racks, bar screens, and silt traps can be quite costly ranging from $250,000 to $900,000.

- A collection facility or curbside collection for used oil may result in significant costs. Commercial locations (automobile service stations, quick oil change centers, etc.) as collection points eliminate hauling and recycling costs.

- Collection and disposal of hazardous waste can be very expensive and requires trained operators; laboratory and detection equipment; and extensive record keeping including dates, types, and quantities.

- Use of volunteer work forces can lower storm drain stenciling program costs. Stenciling kits require procurement of durable/disposable items. The stenciling program can aid in the cataloging of the storm drain system. One municipality from the state of Washington has estimated that stenciling kits cost approximately $50 each. Stencils may cost about $8 each including the die cost on an order of 1,000. Re-orders cost about $1/stencil. Stencil designs may be available from other communities. Stencil kits should be provided on a loan basis to volunteer groups free of charge with the understanding that kit remnants are to be returned.

Maintenance

- The primary staff demand for stenciling programs is for program setup to provide marketing and training. Ongoing/follow-up staff time is minimal because of volunteer services.

- Staffing requirements are minimal for oil recycling programs if collection/recycling is contracted out to a used oil hauler/recycler or required at commercial locations.

- Staff requirements for maintaining good housekeeping BMPs at waste handling sites is minimal.

Supplemental Information

Further Detail of the BMP

Waste Reduction

An approach to reduce stormwater pollution from waste handling and disposal is to assess activities and reduce waste generation. The assessment is designed to find situations where waste can be eliminated or reduced and emissions and environmental damage can be minimized. The assessment involves collecting process specific information, setting pollution prevention targets, and developing, screening and selecting waste reduction options for further study. Starting a waste reduction program is economically beneficial because of reduced raw material purchases and lower waste disposal fees.

References and Resources

Best Management Practices Program for Pollution Prevention, City and County of San Francisco, Uribe & Associates, Oakland, California, 1990.

Harvard University. 2002. Solid Waste Container Best Management Practices – Fact Sheet On-Line Resources – Environmental Health and Safety.

Model Urban Runoff Program: A How-To-Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998. (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp.

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Water & Sewer Utility Maintenance SC-76

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Although the operation and maintenance of public utilities are not considered chronic sources of stormwater pollution, some activities and accidents can result in the discharge of pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drain system. Sewage incident response and investigation may involve a coordinated effort between staff from a number of different departments/agencies. Cities that do not provide maintenance of water and sewer utilities must coordinate with the contracting agency responsible for these activities and ensure that these model procedures are followed.

Approach

Pollution Prevention

Inspect potential non-stormwater discharge flow paths and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).

Suggested Protocols

Water Line Maintenance and Cleaning

Procedures can be employed to reduce pollutants from discharges associated with water utility operation and maintenance activities. Planned discharges may include fire hydrant testing, flushing water supply mains after new construction, flushing lines due to complaints of taste and odor, dewatering mains for maintenance work. Unplanned discharges from treated, recycled water, raw water, and groundwater systems operation and maintenance activities can occur from water main

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

breaks, sheared fire hydrants, equipment malfunction, and operator error.

Planned discharges

- Identify a suitable discharge option in the following order of preference:
  - Apply to the land.
  - Reuse water for dust suppression, irrigation, or construction compaction.
  - Discharge to a sanitary sewer system with approval.
  - Discharge to the storm drain system using applicable pollution control measures. (Only available to clean water discharges such as water main/ water storage tank/water hydrant flushing).
- If water is discharged to a storm drain, control measures must be put in place to control potential pollutants (i.e. sediment, chlorine, etc.). Examples of some storm drain protection options include:
  - Silt fence – appropriate where the inlet drains a relatively flat area.
  - Gravel and wire mesh sediment filter – Appropriate where concentrated flows are expected.
  - Wooden weir and fabric – use at curb inlets where a compact installation is desired.
- Prior to discharge, inspect discharge flow path and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).
- General Design considerations for inlet protection devices include the following:
  - The device should be constructed such that cleaning and disposal of trapped sediment is made easy, while minimizing interference with discharge activities.
  - Devices should be constructed so that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.
- The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications made.

Unplanned Discharges

- Stop the discharge as quickly as possible.
- Inspect flow path of the discharged water:
  - Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions

- Identify the potential for pollutants to be washed into the waterway

- If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control, chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path.

Sanitary Sewer Maintenance

Applicable to municipalities who own and operated a sewage collection system. Facilities that are covered under this program include sanitary sewer pipes and pump stations owned and operated by a municipality. The owner of the sanitary sewer facilities is the entity responsible for carrying out this prevention and response program.

- Clean sewer lines on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.

- Establish routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas such as restaurants that are identified

- Cleaning activities may require removal of tree roots and other identified obstructions.

- During routine maintenance and inspection note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:

  - Cracked/deteriorating pipes

  - Leaking joints/seals at manhole

  - Frequent line plugs

  - Line generally flows at or near capacity

  - Suspected infiltration or exfiltration.

- Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.

- Review previous sewer maintenance records to help identify "hot spots" or areas with frequent maintenance problems and locations of potential system failure.

Spills and Overflows

- Identify and track sanitary sewer discharges. Identify dry weather infiltration and inflow first. Wet weather overflow connections are very difficult to locate.

- Locate wet weather overflows and leaking sanitary sewers using conventional source identification techniques such as monitoring and field screening. Techniques used to identify other illicit connection sources can also be used for sewer system evaluation surveys (see SC74 Drainage System Operation and Maintenance).

- Implement community awareness programs for monitoring sanitary sewer wet weather overflows. A citizen's hotline for reporting observed overflow conditions should be established to supplement field screening efforts.

- Establish lead department/agency responsible for spill response and containment. Provide coordination within departments.

- When a spill, leak, and/or overflow occurs and when disinfecting a sewage contaminated area, take every effort to ensure that the sewage, disinfectant and/or sewage treated with the disinfectant is not discharged to the storm drain system or receiving waters. Methods may include:

  - Blocking storm drain inlets and catch basins

  - Containing and diverting sewage and disinfectant away from open channels and other storm drain fixtures (using sandbags, inflatable dams, etc.)

  - Removing the material with vacuum equipment

- Record required information at the spill site.

- Perform field tests as necessary to determine the source of the spill.

- Develop notification procedures regarding spill reporting.

Septic Systems

- Ensure that homeowners, installers, and inspectors are educated in proper maintenance of septic systems. This may require coordination with staff from other departments. Outreach to homeowners should include inspection reminders informing then that inspection and perhaps maintenance is due for their systems. Recommend that the system be inspected annually and pumped-out regularly.

- Programs which seek to address failing septic systems should consider using field screening to pinpoint areas where more detailed onsite inspection surveys are warranted.

Training

- Conduct annual training of water utility personnel and service contractors. (field screening, sampling, smoke/dye testing, TV inspection).

- OSHA-required Health and Safety Training 29 CFR 1910.120 plus annual Refresher Training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and federal OSHA 29 CFR 1910.146).

Spill Response and Prevention

- See previous section regarding spills and overflows.
- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Enact ordinance granting "right-of-entry" to locate potentially responsible parties for sewer overflows.
- Reliance on individual onsite inspection to detect failed septic systems can be a major limitation. The individual onsite inspection is very labor-intensive and requires access to private property to pinpoint the exact location of the failing system.
- A significant limitation to correcting failing septic systems is the lack of techniques available for detecting individual failed septic systems.

Requirements

Costs

- Departmental cooperation recommended for sharing or borrowing staff resources and equipment from municipal wastewater department.
- Infiltration, inflow, and wet weather overflows from sanitary sewers are very labor and equipment intensive to locate.
- The costs associated with detecting and correcting septic system failures are subject to a number of factors, including availability of trained personnel, cost of materials, and the level of follow-up required to fix the system problems.

Maintenance

- Minimum 2-person teams to perform field screening and associated sampling.
- Larger teams required for implementing other techniques (i.e. zinc chloride smoke testing, fluorometric dye testing, television camera inspection and physical inspection with confined space entry) to identify sewer system leaks.
- Program coordination required for handling emergencies, record keeping, etc.
- Many of the problems associated with improper use of septic systems may be attributed to lack of user knowledge on operation and maintenance. Educational materials for homeowners and training courses for installers and inspectors can reduce the incidence of pollution from these widespread and commonly used pollution control devices.

SC-76 Water & Sewer Utility Maintenance

Supplemental Information

Further Detail of the BMP

Onsite Sewage Disposal Systems

New onsite sewage disposal systems should be designed, located, and installed away from open waterbodies and sensitive resources such as wetlands and floodplains. A protective separation between the OSDS and groundwater should also be established. OSDSs should be operated and maintained to prevent surface water discharges and reduce pollutant loadings to groundwater. Inspection of OSDSs should occur regularly and repairs made immediately. New or replacement plumbing fixtures should be of the high efficiency type.

Typical Sanitary Sewer Problems

- Old and deteriorated main and lateral pipes - Sewers range in age from 30 to 100 years with an average age of 50 years.
- Cracked sewer pipes - Existing sewers are mostly clay pipes which can crack as they deteriorate with age and also by earth movement.
- Misaligned and open pipe joints - Most of the mortar used to seal the joints between sections of clay pipe has deteriorated.
- Undersized sewer pipe - The existing sewer system is overloaded due to new sewer hook-ups, underground water infiltration, and illegal roof and/or yard drain connections.
- Defective manholes - Old manholes are made of bricks. Typical problems associated with brick manholes are loose bricks, missing bricks, and misaligned manholes.
- Missing and/or unrecorded sewer pipes and manholes - This problem is typical in the easement/backline sewer. Sewer pipe locations shown on the sewer record map are different from the actual sewer location.
- Sewer main under houses and other improvements - Complaints of sewer main alignment crossing the house and other improvements. A solution to this problem requires an agreement with the property owner for a new sewer easement at a relocated line.

Causes of Sanitary Sewer Backups

- Root infiltration - Tree roots are a major cause of backups.
- Water inflow/infiltration - Rain water entering the sewer pipe causes overflows.
- Solids - Typical solids that buildup in the pipe and cause backups are grease, dirt, bones, tampons, paper towels, diapers, broken dishware, garbage, concrete, and debris.
- Structural defects in pipes and manholes - Sags in the line, cracks, holes, protruding laterals, misaligned pipe, offset joints are all possible causes of backups.

Design Considerations

Sanitary sewer overflows can often be reduced or eliminated by a number of practices, in addition to sewer system cleaning and maintenance, including the following:

- Reducing infiltration and inflow through rehabilitation and repair of broken or leaking sewer lines.
- Enlarging or upgrading the capacity of sewer lines, pump stations, or sewage treatment plants.
- Constructing wet weather storage and treatment facilities to treat excess flows.
- Addressing SSOs during sewer system master planning and facilities planning.

Septic Systems

Two field screening techniques that have been used with success at identifying possible locations of failing septic systems are the brightener test and color infrared (CIR) aerial photography. The first involves the use of specific phosphorus-based elements found in many laundry products, often called brighteners, as an indicator of the presence of failing onsite wastewater systems. The second technique uses color infrared (CIR) aerial photography to characterize the performance of septic systems. This method has been found to be a quick and cost-effective method for assessing the potential impacts of failing systems and uses variations in vegetative growth or stress patterns over septic system field lines to identify those systems that may potentially be malfunctioning. Then a more detailed onsite visual and physical inspection will confirm whether the system has truly failed and the extent of the repairs needed. These inspections may be carried out by county health departments or other authorized personnel.

References and Resources

Alameda Countywide Clean Water Program on-line
http://www.ci.berkeley.ca.us/pw/Storm/stormala.html

Los Angeles County Stormwater Quality. Public Agency Activities Model Program. On-line:
http://ladpw.org/wmd/npdes/public_TC.cfm

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1998. Water Utility Operation and Maintenance Discharge Pollution Prevention Plan. June

United States Environmental Protection Agency (USEPA). 2001. Illicit Discharge Detection and Elimination. On-line: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illi_1.cfm

United States Environmental Protection Agency (USEPA). 2001. Pollution Prevention/Good Housekeeping for Municipal Operators Septic System Controls. On-line: http://www.epa.gov/npdes/menuofbmps/poll_14.htm

The Complete Guide to Residential Recycling

Southwest Riverside County

Canyon Lake, Hemet, Lake Elsinore, Menifee, Murrieta, Perris, San Jacinto, Temecula, Wildomar

Used Oil and Filters

Recycling used motor oil and filters is easy!
Simply take them to one of the certified collection centers below. **It's free!**

RECYCLE USED OIL

RECYCLE USED OIL FILTERS

Hemet

AutoZone #2820
1550 W. Florida Ave.
(951) 929-0807

AutoZone #5556
3100 E. Florida Ave.
(951) 652-1308

EZ Lube #112
532 W. Florida Ave.
(951) 766-1996

Firestone Store #2233
350 W. Florida St.
(951) 929-2424

Inland Chevrolet
350 Carriage Circle
(951) 658-4401

Integrity Tire
3223 W. Florida Ave.
(951) 658-3145

Jiffy Lube #3187
330 N Sanderson Ave.
(951) 487-2001

Masterlube #101
3615 W. Florida St.
(951) 766-7055

O'Reilly Autoparts #1332
849 W. Florida Ave.
(951) 929-2210

Pep Boys #866
2050 W. Florida Ave.
(951) 766-1477

Ramona Tire
2350 W. Menlo Ave.
(951) 925-6659

Synfast Oil Change
3615 W. Florida Ave.
(951) 766-7055

Valvoline Instant Oil Change
532 W. Florida Ave.
(951) 766-1996

Idyllwild

Idyllwild Garage
25015 Hwy. 243
(951) 659-2613

Lake Elsinore

AutoZone #5558
30870 Riverside Dr.
(951) 674-7806

AutoZone #5559
32231 Mission Trail
(951) 245-1012

Express Tire
300 Diamond Dr.
(951) 674-0794

EZ Lube #96
29285 Central Ave.
(951) 253-5200

Firestone Store #2238
31748 Mission Trail
(951) 674-0633

Jiffy Lube #2681
311 Summerhill Dr.
(951) 471-8445

O'Reilly Autoparts #1429
31660 Grape St.
(951) 245-8389

Valvoline Instant Oil Change
29285 Central Ave.
(951) 253-5200

Menifee

AutoZone #5561
30123 Antelope Rd.
(951) 301-7240

One Stop Lube & Oil Center
26825 Newport Rd.
(951) 301-7479

Murrieta

AutoZone #5566
40950 California Oaks Rd.
(951) 677-6206

Express Tire
40615 California Oaks Rd.
(951) 696-5200

EZ Lube #115
40430 California Oaks Rd.
(951) 696-2882

Mountain View Tire and Service
27584 Clinton Keith Rd.
(888) 860-0535

Murrieta Volkswagen
41300 Date St.
(951) 634-5434

O'Reilly Autoparts #1430
40951 California Oaks Rd.
(951) 696-2991

Valvoline Instant Oil Change
40430 California Oaks Rd.
(951) 696-2882

Perris

AutoZone #5570
401 E. 4th St.
(951) 657-0696

AutoZone #5571
1675 Perris Blvd.
(951) 943-5998

Jiffy Lube #3294
118 E. Ramona Expressway
(951) 943-2200

Jiffy Lube #3361
3150 Case Rd., Bldg. J.
(951) 284-0922

O'Reilly Autoparts #1046
119 W. Nuevo Rd.
(951) 657-1488

San Jacinto

AutoZone #5581
1540 San Jacinto Ave.
(951) 654-2216

Jiffy Lube #3186
635 S. State St.
(951) 487-2001

Ramona Auto Services, Inc.
2447 S. San Jacinto Ave.
(951) 925-5117

Temecula

AutoZone #5582
31837 US Hwy. 79
(951) 302-8334

AutoZone #5936
40345 Winchester Rd.
(951) 296-3973

DCH Acura of Temecula
26705 Ynez Rd.
(951) 491-2451

Used Oil and Filters

You can also find Certified Collection Centers on the Cal Recycle Website:
www.calrecycle.ca.gov/recycle

Used Oil and Filters

Used Oil and Filters

Temecula

DCH Chrysler Jeep Dodge of Temecula
26845 Ynez Rd.
(951) 491-2151

DCH Honda of Temecula
26755 Ynez Rd.
(951) 491-2351

Express Tire
40915 Winchester Rd.
(951) 296-6699

Express Tire
44092 Margarita Rd.
(951) 302-5033

Express Tire
29095 Front St.
(951) 695-0555

EZ Lube #85
30625 Highway 79 South
(951) 553-7399

Jiffy Lube #1878
30690 Rancho California Rd.
(951) 694-5460

John Hine Temecula Mazda
42050 DLR Dr.
(951) 553-2000

O'Reilly Autoparts #0483
41125 Winchester Rd., #C1
(951) 296-5530

O'Reilly Autoparts #4291
33417 Temecula Pkwy.
(951) 302-1351

Paradise Chevrolet Cadillac
27360 Ynez Rd.
(951) 506-0058

Pep Boys #800
40605 Winchester Rd.
(951) 695-2322

Precision Tune Auto Care
26673 Ynez Rd., #A
(951) 699-6969

Promethean Biofuels Cooperative
27635 Diaz Rd.
(626) 232-7608

Quality Nissan
41895 Motor Car Pkwy.
(951) 676-6601

Ramona Auto Services, Inc.
40385 Winchester Rd.
(951) 719-1600

Ramona Auto Services, Inc.
31955 Via Rio Rd.
(951) 303-3584

Ramona Tire
40385 Winchester Rd.
(951) 719-1600

Rancho Car Wash and Quick Lube
27378 Jefferson Ave.
(951) 296-5644

Temecula Hyundai
27430 Ynez Rd.
(951) 699-6807

Temecula Quick Lube
29764 Rancho California Rd.
(951) 587-6624

Valvoline Instant Oil Change
30625 Highway 79 South
(951) 553-7399

Wildomar

Grease Monkey
32120 Clinton Keith Rd.
(951) 609-3000

Jiffy Lube #3412
32374 Clinton Keith Rd.
(951) 678-5300

Winchester

Mountain View Tire/Goodyear
30664 Benton Rd.
(877) 872-1021

Curbside pickup of used oil is available in some cities in Riverside County. Contact your waste hauler for more information. Waste hauler contact information is provided on the back page of this guide.

You may not need to change your oil every 3000 miles! Save time, money, and the environment by visiting **www.checkyournumber.org** to find out what your manufacturer recommended oil change interval is.

Locations marked with a also accept oil filters.

Please DO NOT drop off oil when the location is closed. **For more information about used oil collection centers call 800-350-4OIL.**

Household Hazardous Waste

Examples of household waste that are considered hazardous include:

- Batteries (all types)
- Electronic Waste
- Paint
- Used Oil and Antifreeze
- Sharps/ Needles

Permanent Household Hazardous Waste Collection Centers

Lake Elsinore Area (Closed January and December)

Lake Elsinore Regional Permanent HHW Collection Facility
512 N. Langstaff Street, Lake Elsinore, 92530
Open first Saturday of the month*, 9:00 a.m. to 2:00 p.m.
*Except holiday weekends and during inclement weather.

Riverside Area

Agua Mansa Regional Permanent HHW Collection Facility
1780 Agua Mansa Road, Riverside, 92509
Open non-holiday Saturdays*, 9:00 a.m. to 2:00 p.m.
*Except during inclement weather.

Regional ABOP Collection Centers (Antifreeze, Batteries, Oil and Oil Filters, and Latex Paint ONLY)

Murrieta Area

County Road Yard
25315 Jefferson Avenue, Murrieta, 92562
Open Non-Holiday Saturdays, 9:00 a.m. to 2:00 p.m.

These sites accept residential waste only. For more information, contact the Riverside County Household Hazardous Waste Department Hotline at **800-304-2226 or 951-486-3200, or visit, www.rivcowm.org/opencms/hhw/index.html**

Household Hazardous Waste

Below is a list of materials accepted at permanent HHW collection sites.*

Chemicals and Cleaners

Adhesives
Air Freshener
Aluminum Cleaners
Ammonia
Antifreeze
Brake Fluid
Carburetor Cleaner
Caulking
Chlorine Bleach
Chrome Polish
Disinfectant
Drain Cleaner
Engine Degreaser
Fertilizer
Fiberglass and Resins
Flea Powder
Floor / Surface Cleaners
Fungicides
Furniture Polish
Gas / Diesel Fuel
Glue
Gun Cleaner
Hair Dye
Hobby Chemicals
Insecticides / Pesticides
Kerosene / Lamp Oil
Lighter Fluid
Motor Oil
Mercury Devices
Oven Cleaner
Paint - Latex / Oil Based
Paint Stripper / Thinner
Photo Chemicals
Pool / Spa Chemicals
Rodent Bait / Poison
Roof Coating
Shoe Dye
Spot Remover
Transmission Fluid
Turpentine
Varnish
Weed Killer / Herbicide
Wood Preservative

Aerosols and Tanks

Aerosol Insecticides
Aerosol Cans
BBQ Propane Tanks
Camp Propane Tanks

E-Waste and Batteries

Batteries (all types)
Electronic Devices
Fluorescent Bulbs / Tubes
Old TVs and Computers

Medical Waste

Sharps / Needles

Please DO NOT bring the following types of materials (If you have any of these wastes please call (951) 486-3200):

Unacceptable Materials

Business, Non-Profit, or Out-of-County Waste
Explosives / Ammunition
Radioactive or Remediation Materials
Medical / Infectious Waste (Except Sharps)
Asbestos
Appliances
Tires
55 or 30 Gallon Drums
Compressed Gas Cylinders >40 lbs
Trash

*Maximum Chemical Load: 5 Gallons or 50lbs per trip. Residential waste only, no business waste accepted.

Recycling

Recycling

What can go into your curbside recycling bins? Not sure what you can recycle? Check out the list below.

Paper and Cardboard

- Books and Coloring Books
- Cardboard
- Cardstock and Construction Paper
- Office Paper
- Egg Cartons
- Clean Food Boxes
- Junk Mail and Envelopes
- Magazines and Newspapers
- Notebook Paper
- Paper Bags
- Telephone Books

Metal

- Aluminum and Steel Cans
- Clean Aluminum Foil
- Scrap Metal

Glass Jars and Bottles

- Glass Jars
- Beverage Bottles

Plastic Bottles and Grocery Bags

- Plastic Milk Jugs
- Plastic Beverage Containers
- Plastic Grocery Bags

Used Tires

Used tires are accepted at various locations in Riverside County. There is generally a fee to dispose of tires. The following locations accept tires:

Badlands Landfill

31125 Ironwood Ave., Moreno Valley, 92553

Lamb Canyon Landfill

16411 Lamb Canyon Rd., Beaumont, 92223

Visit www.rivcowm.org/opencms/landfill_info/landfill_fees.html for information on current landfill pricing.

BAS Recycling, Inc.

14050 Day St., Moreno Valley, 92553
(909) 383-7050
Call facility for pricing.

Electronic Waste Recyclers

Badlands, Lamb Canyon, and El Sobrante Landfills accept up to 2 CRT devices (e.g. computer monitors or TVs) per day for recycling at **no cost** during operating hours. The following recyclers also accept electronic waste:

The Green Guys Recycling, Hemet - (951) 757-9156
Starsurplus.com, Murrieta - (951) 677-5696
XIT Communications, Murrieta - (951) 691-5138
CR&R, Perris - (800) 755-8112
Tire Stop & Recycling, Sun City - (951) 928-9600
GKAT, INC. dba Temecula Recycling, Temecula - (951) 693-1500
Heavy Metal Scrap & Recycling, Inc., Temecula - (951) 693-4677

Other Recycling Facilities

For a complete list of recycling facilities visit www.calrecycle.ca.gov and click on the “Recycle Tab.”
Earth911.com also provides valuable information and resources about recycling and recycling facilities.

Reycling Centers

What should you do with those empty cans and bottles? Below is a list of centers that accept beverage containers for recycling*.

Hemet

EarthWize Recycling
1231 S. Sanderson Ave.
(909) 933-2773

Menlo Recycle Center
445 E. Menlo Ave.
(951) 766-8520

NexCycle
1295 S. State St.
(800) 969-2020

NexCycle
3125 W. Florida Ave.
(800) 969-2020

rePlanet
43396 US Hwy 74
(877) 737-5263

The Green Guys Recycling
100 N. State St., #101
(951) 757-9156

Valley Metals
342 N. Juanita St.
(951) 925-8577

Lake Elsinore

Cans Plus Recycling
29170 Riverside Dr., #1
(951) 245-1178

Downtown Elsinore Recycling
217 N. Main St.
(323) 204-8308

Lake Elsinore Recycling Center
1315 W. Flint St.
(951) 579-4102

Love Earth Recycling
31949 Corydon Rd., #160
(951) 230-6580

NexCycle
31564 Grape St.
(909) 796-2210

rePlanet
32281 Mission Tr.
(951) 520-1700

rePlanet
16750 Lakeshore Dr.
(877) 737-5263

Menifee

rePlanet
30125 Antelope Rd.
(951) 520-1700

rePlanet
25904 Newport Rd.
(877) 737-5263

Neill's Recycling
26026 Sherman Rd.
(951) 514-8656

NexCycle
27220 Sun City Blvd.
(909) 796-2210

Tire Stop and Recycling
27491 Ethanac Rd.
(888) 515-1376

Murrieta

EarthWize Recycling
27826 Clinton Keith Rd.
(909) 933-2773

Go Green Murrieta Recycling
40645 Cal. Oaks Rd.
(818) 220-9540

Murrieta Recycling
38365 Innovation Ct., #1102-1105
(951) 894-3094

rePlanet
40473 Murrieta Hot Springs Rd.
(951) 520-1700

rePlanet
23801 Washington Ave.
(951) 520-1700

rePlanet
4100 Cal. Oaks Rd.
(951) 520-1700

rePlanet
39140 Winchester Ave.
(951) 520-1700

rePlanet
28047 Scott Rd.
(877) 737-5263

SA Recycling
41400 Date St.
(951) 677-8586

Recycling Centers

Perris

A-1
24440 Hwy 74
(951) 940-4224

Ecology Auto Parts
23332 Cajalco Rd.
(951) 657-7725

Go Green Recycling
164 Malbert St., #A-2
(951) 487-5875

Harb Family Market Recycling
22707 San Jacinto Ave.
(951) 657-7733

4th Street Recycling
510 W. 4th St.
(323) 204-8308

Menlo Recycle Center
151 W. 7th St.
(951) 657-8200

RecycleWise
200 Sinclair St. #4
(951) 443-1894

Recycling Depot
1320 W. Oleander Ave.
(951) 442-5221

rePlanet
47 W. Nuevo Rd.
(877) 737-5263

San Jacinto

CA Recycling
762 S. San Jacinto Ave.
(951) 651-0010

rePlanet
1271 N. State St.
(877) 737-5263

San Jacinto Recycling Center
658 W. Esplanade Ave.
(951) 654-1399

Temecula

Heavy Metal Scrap Reycling Inc.
43136 Rancho Way
(951) 693-4677

NexCycle
29530 Rancho California Rd.
(909) 796-2210

NexCycle
26419 Ynez Rd.
(909) 796-2210

rePlanet
30530 Rancho California Rd.
(951) 520-1700

rePlanet
33293 Temecula Pkwy.
(951) 520-1700

rePlanet
31813 Temecula Pkwy.
(877) 737-5263

Temecula Recycling
27635 Diaz Rd., #120
(951) 693-1500

Wildomar

rePlanet
23893 Clinton Keith Rd.
(951) 520-1700

rePlanet
30712 Benton Rd.
(877) 737-5263

*Some recycling centers may accept other recyclable materials. It is advisable to call the center and confirm this, as well as operating hours, before visiting.

Fore more information about local recycling centers visit the **CalRecycle** website: **www.calrecycle.ca.gov.**

Types of Plastic

Confused about the types of plastic and if they can be recycled? Many plastic containers display an identification code that indicates what they are made from. Below are the 7 codes.

#1: Polyethylene Terephthalate (PETE or PET)
Used to create 2-liter soda bottles, water bottles, cooking oil bottles, peanut butter jars.
The most commonly accepted plastic for recycling.

#2: High Density Polyethylene
Used to create detergent bottles, milk and water jugs, grocery bags, yogurt cups.
Commonly accepted for recycling. Bags can be recycled at some large grocery stores.

#3: Polyvinyl Chloride
Used to create plastic pipes, outdoor furniture, shrink-wrap, liquid detergent containers, flooring, showercurtains.
Not currently accepted for recycling.

#4: Low Density Polyethylene
Used to create food storage containers, cellophane wrap, dry cleaning bags, produce bags, trash can liners.
Not commonly recycled, some large grocery stores accept LDPE bags.

#5: Polypropylene
Used to create ketchup bottles, aerosol caps, drinking straws, yogurt containers.
Not commonly accepted for recycling.

#6: Polystyrene
Also known as "Styrofoam." Used to make coffee cups, take-out food packaging, egg cartons, and packaging "peanuts."
Sometimes accepted for recycling and made into the same products.

#7: Other
All other plastic resins or a mixture of resins used to make reusable water bottles, Tupperware, biodegradable and compostable plastics.
Not commonly accepted for recycling.

Composting Basics

Got food scraps and yardwaste? Below is a quick guide to Backyard Composting.

1. Select a good spot for composting

- Sun or shade
- Convenient to kitchen or garden, and close to a source of water
- Keep away from structures and wood, as moisture can hasten decay
- Place only on bare ground, as organisms from soil are needed

2. Know the Ingredients

Nitrogen - Green materials - grass clippings, fresh leaves and twigs, vegetable and fruit trimmings, coffee grounds and filters, and non-meat eating animal manures.

Carbon - Brown materials that have released their nitrogen - dry and brittle leaves and grasses, straw, wood chips, corn stalks, shredded newspaper, paper towels, napkins, and cardboard.

Water - The correct moisture level should be about the same as a damp wrung out sponge. A few drops should fall when squeezed in your hand.

Air - Oxygen is very important to the bacteria, fungi, and microorganisms that are working in the pile to breakdown the organic material.

Do Not Add - Meat, dairy products, fats, oils, waste from meat eating animals (dogs and cats), thorny plant material, or diseased plant material.

2. Know the Methods

Aerobic - Pile equal parts green and brown material on ground or in a bin in a 3'x3'x3' heap, water well, and cover with a tarp, carpet or opaque plastic sheet. The pile will heat up (120 to 160 degrees), and needs to be turned after a few days, once it has cooled. Turn the pile weekly and continue composting until the pile has a dark rich look like chocolate cake and the things you put in don't look like their original form. After the compost is done, water well, cover, and let it rest for one to two weeks to make sure it is completely done and the nitrogen has a chance to stabilize. If the compost is used too soon it could rob nutrients from the surrounding plants. Remove large chunks and add them to the next compost pile.

Anerobic - Similar to the Aerobic method, but there is no need to actively turn the material. It may take longer (1-2 years), but is still beneficial to your garden. Just pile the stuff, water, cover, and wait.

For more detailed information on composting, free workshops, or other methods, such as **Vermicomposting**, visit www.rivcowm.org and search for composting.

Source Reduction

The best way to reduce waste is to prevent it!

Buy Responsibly

Reduce packaging waste - Look for products that reduce packaging, or purchase in bulk to reduce the amount of packaging needed.

Look for products containing recycled material - Recycled paper products, motor oil, and even pens and pencils are just a few examples of products that reduce waste.

Consider reusable products - Buy reusable water bottles and sturdy utensils and plates that can be washed and used again.

Get it "For Here," or bring your own - Many coffee shops will provide drinks to their customers in ceramic mugs rather than paper cups if requested. Just ask! Reusable tumblers are also a great alternative to paper cups, and many establishments will even give a small discount to those who bring their own!

Borrow, rent, or share - Why buy something if you are only going to use it once? Items such as tools, party decorations, and even newspapers and magazines can be shared with your friends, family, and/or community.

Purchase rebuilt, remanufactured, or refurbished - Many electronics such as cell phones, computers, and media players can be purchased "refurbished" at a sometimes substantial price reduction. This conserves the resources needed to manufacture a new product.

Choose Non-Toxic

Choose products that contain only non-toxic materials, or try one of these **homemade alternatives**:

- Instead of glass cleaner, dilute 1 cup of vinegar in 1 quart of water.
- To open clogged drains, flush with a mixture of boiling water, and equal parts baking soda and vinegar.

For more information on non-toxic alternatives, visit the California Coastal Commission website:
http://www.coastal.ca.gov/ccbn/lesstoxic.html

Source Reduction

Plastic bags and junk mail contribute to a significant amount of un-needed waste. You can lessen their impact by Reducing, Reusing, and Recycling.

Plastic Bags

Reduce: BYOB (Bring Your Own Bag) - Use reusable canvas or cloth bags rather than plastic bags, and keep them in your car. Not all items need a bag, just say "no, thank you."

Reuse - Plastic grocery bags can serve multiple purposes, such as trash can liners or for pet waste.

Recycle - If you find that you must use a plastic bag, recycle it when you are finished. Most large supermarkets and pharmacies offer free recycling of plastic bags.

Junk Mail Reduction

You can reduce the amount of unwanted junk mail in your mailbox by simply mailing a postcard to the following addresses, requesting your name be removed from their mailing list. Be sure to include your full name, your address(es), your signature, and the date.

Mail Preference Service
Attn.: Dept. 10088342
PO Box 282
Carmel, NY 10512

ADVO
Consumer Assistance
PO Box 249
Windsor, CT 06095

Harte-Hanks Circulation
C/O Pennysaver
2830 Orbiter St.
Brea, CA 92821

Valpak Direct Marketing Systems, Inc.
8605 Largo Lakes Dr.
Largo, FL 33773

Credit Card Junk Mail
Call (888)5-OPT OUT (888-567-8688)

City / County Resources

City of Canyon Lake - Waste and Recycling | (800) 755-8112
http://www.cityofcanyonlake.com/recycling.asp

City of Hemet - Integrated Waste Management | (951) 765-3712
http://www.cityofhemet.org/index.aspx?nid=93

City of Lake Elsinore - Recycling | (951) 674-3124
http://www.lake-elsinore.org/index.aspx?page=751

City of Menifee - Public Works Department | (951) 672-6777
http://www.cityofmenifee.us/index.aspx?nid=99

City of Murrieta - Trash & Recycling | (951) 461-6007
http://www.murrieta.org/services/trash

City of Perris - Waste & Recycling | (951) 943-6100
http://www.cityofperris.org/residents/waste-recycle.html

City of San Jacinto - Waste & Recycling | (951) 487-7330
http://www.san-jacinto.ca.us/residents/waste.html

City of Temecula - Trash & Recycling | 951-694-6444
http://www.cityoftemecula.org/temecula/residents/trashrecycling/recycling.htm

City of Wildomar - Trash Hauling and Recycling | (951) 677-7751
http://www.cityofwildomar.org/trash-hauling-recycling.asp

County of Riverside - Riverside County Waste Management Department
http://www.rivcowm.org | (951) 486-3200

Western Riverside Council of Governments
http://www.wrcog.cog.ca.us | (800) 350-4645

Waste Haulers

Waste Management, Inc. - (951) 280-5400 - www.wm.com
Serves: Menifee, Murrieta, and Wildomar

CR&R Disposal - (951) 943-1991 - www.crrwasteservices.com
Serves: Canyon Lake, Hemet, Lake Elsinore, Perris, San Jacinto, and Temecula

The Complete Guide to Residential Recyling is sponsored by:

Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

After the Storm

For more information contact:

or visit
www.epa.gov/npdes/stormwater
www.epa.gov/nps

EPA 833-B-03-002

January 2003

Internet Address (URL) • HTTP://www.epa.gov
Recycled/Recyclable • Printed With Vegetable Oil Based Inks on 100% Postconsumer, Process Chlorine Free Recycled Paper

A Citizen's Guide to Understanding Stormwater

Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

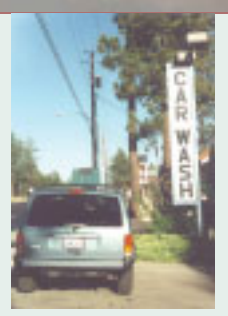
- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Auto care



Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

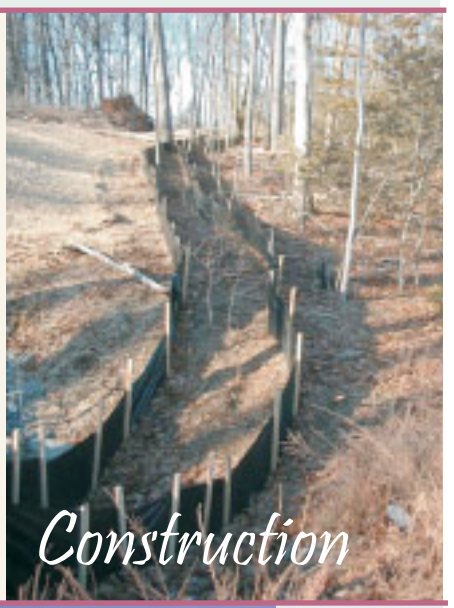
Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



Construction

Agriculture

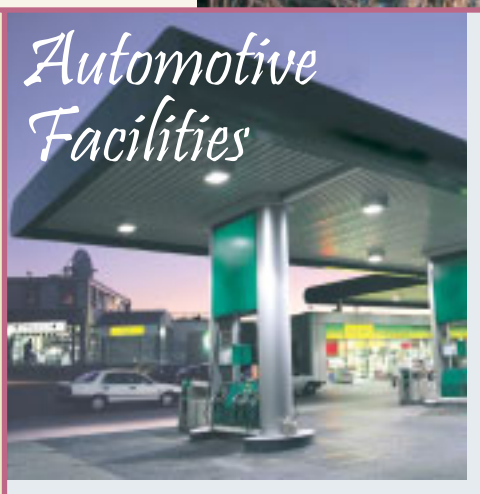
Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.



Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

The Complete Guide to Residential Recycling

Northwest Riverside County

Banning, Calimesa, Corona, Eastvale, Jurupa Valley,
Moreno Valley, Norco, Riverside

Used Oil and Filters

RECYCLE USED OIL

Recycling used motor oil and filters is easy!
Simply take them to one of the certified collection centers below. **It's free!**

Banning

AutoZone
3453-A W. Ramsey St.
(951) 849-7626

Certified Tire & Service Center Goodyear
1820 W. Ramsey St.
(951) 849-5028

Diamond Hills Auto Group
4545 W. Ramsey St.
(951) 849-7861

Cruz Industrial Truck Inc.
313 South Gallaher Way
(951) 849-7861

Corona

AutoZone
501 North McKinley St.
(951) 278-2073

AutoZone
1280 East Ontario Ave.
(951) 273-1583

AutoZone
1014 W. 6th St.
(951) 371-4730

Corona Nissan
2575 Wardlow Rd.
(877) 322-6739

Firestone Store
522 N. Main St.
(951) 735-4101

Goodyear Mountain View Tire
1630 E. Ontario Ave.
(951) 808-0818

Hamner Towing & Service Center
2125 Railroad St.
(951) 734-9331

Heavy Equipment Rentals
13013 Temescal Cyn. Rd.
(951) 609-4623

Jiffy Lube
906 W. 6th St.
(951) 549-9060

Jiffy Lube
1600 E. Ontario Blvd.
(951) 284-0922

O'Reilly Autoparts
1220 Magnolia Ave.
Suite 102
(951) 273-9891

O'Reilly Autoparts
1142 W. 6th St.
(951) 735-0936

Pep Boys
581 N. Main St.
(951) 279-9230

Quality Toyota
1700 W. Sixth St.
(951) 734-6020

Ramona Tire
304 W. Sixth St.
(951) 734-1222

Certified Tire and Service
624 N. Main St.
(951) 284-3443

Certified Tire and Service
2189 Sampson Ave., # 111
(951) 547-2080

Team Dykstra Carwash & Lube Center
2315 California Ave.
(951) 898-6482

Eastvale

Mountain View Tire
6080 Hamner Ave., #105
(909) 484-9497

Autozone
14228 Schleisman Rd.
(951) 898-4712

Jurupa Valley

D & B Automotive and Transmission
4321 Campbell St., #C
(951) 681-6483

Firestone Complete Auto Care
8360 Limonite Ave.
(951) 934-7304

LKQ Pick A Part
3760 Pyrite St.
(800) 749-2720

O'Reilly Autoparts
8702 Limonite Ave.
(951) 685-0822

Used Oil and Filters

RECYCLE
USED OIL FILTERS

You can also find Certified Collection Centers on the Cal Recycle Website:
www.calrecycle.ca.gov/recycle

Scher Goodyear Tire #24
6072 Camino Real
(951) 685-1000

AutoZone
3782 Riverview Dr.
(951) 275-0301

Moreno Valley

Auto Express Moreno Valley
24035 Sunnymead Blvd., #G
(951) 924-6363

AutoZone
27660 Eucalyptus Ave.
(951) 242-5190

AutoZone
16210 Perris Blvd.
(951) 242-2026

AutoZone
24570 Alessandro Blvd.
(951) 242-8439

AutoZone
12601 Perris Blvd.
(951) 242-4353

AutoZone
23510 Sunnymead Blvd.
(951) 924-5460

Buds Moreno Valley Tire Pros
22510 Alessandro Blvd.
(951) 776-7211

Certified Tire & Service Center
16190 Perris Blvd.
(951) 243-5655

Certified Tire & Service Center
23920 Alessandro Blvd., #A
(951) 656-6466

Certified Tire & Service Center
23135 Hemlock Ave.
(951) 369-0025

Firestone
24673 Alessandro Blvd.
(951) 242-6631

Integrity Tire
24901 Sunnymead Blvd.
(951) 656-6466

Moss Bros. Chevrolet
12625 Auto Mall Dr.
(951) 658-3145

Moss Brothers Honda
27910 Eucalyptus Ave.
(951) 486-9366

Moss Brothers Buick, GMC
8146 Auto Drive
(951) 242-2223

Moss Brothers Chrysler Jeep Dodge
27810 Eucalyptus Ave.
(951) 486-9288

Moss Brothers Toyota
12630 Motor Way
(951) 247-8000

Moss Brothers Volkswagen
27750 Eucalyptus Ave.
(951) 485-4188

O'Reilly Autoparts #1304
24021 Alessandro Blvd., #C
(951) 242-0641

O'Reilly Autoparts #1704
12240 Perris Blvd.
(951) 247-5509

Pep Boys #724
23470 Sunnymead Blvd.
(951) 247-4564

Valvoline Instant Oil Change
23165 Hemlock Ave.
(951) 247-1873

Norco

AutoZone #3340
1404 Hamner Ave.
(951) 817-9432

Browning Dodge Chrysler Jeep Ram
1983 Hamner Ave.
(951) 272-3110

Jiffy Lube
2925 Hamner Ave.
(951) 284-0210

Goodyear Mountain View Tire
2935 Hamner Ave.
(877) 872-0133

O'Reilly Autoparts
1050 Hamner Ave.
Suite 1616
(951) 898-1283

Used Oil and Filters

RECYCLE USED OIL

Riverside

Auto Express Riverside
11850 Magnolia Ave.
(951) 351-8875

AutoZone
7315 Indiana Ave.
(951) 637-6701

AutoZone
1947 University Ave.
(951) 788-4013

AutoZone
4195 Van Buren Blvd.
(951) 359-7760

AutoZone
19486 Van Buren Blvd.
(951) 653-5585

AutoZone
10249 Arlington Ave.
(951) 688-0296

AutoZone
6047 Magnolia Ave.
(951) 784-9201

AutoZone
3400 La Sierra Ave.
(951) 354-0781

BMW Of Riverside
3060 Adams St.
(951) 785-4444

Bud's Tire and Wheel
8651 Indiana Ave.
(951) 776-7211

Bud's Tire and Wheel Orangecrest
15967 Wood Rd.
(951) 776-7211

Goodyear Certified Tire & Service Center
8994 Trautwein Rd.
(951) 653-6800

Goodyear Certified Tire & Service Center
7341 Indiana Ave.
(951) 343-8535

Dutton Motor Company
8201 Auto Dr.
(951) 687-2020

Firestone Store
4199 Market St.
(951) 289-7811

Firestone Store
10091 Magnolia Ave.
(951) 977-5863

George Fritts Auto Repair
91 Commercial Ave.
(951) 788-9043

Jiffy Lube
3693 La Sierra Ave.
(951) 359-8999

Malcolm Smith Motorsports
7599 Indiana Ave.
(951) 687-1300

Moss Motors Dodge
8151 Auto Center Dr.
(951) 688-6200

O'Reilly Autoparts
6160 Arlington Ave.
(951) 689-0944

O'Reilly Autoparts
3790 Jurupa Ave.
(951) 682-6082

O'Reilly Autoparts
1691 University Ave.
(951) 222-2900

O'Reilly Autoparts
9929 Magnolia Ave.
(951) 359-3041

O'Reilly Autoparts
18570 Van Buren Blvd.
(951) 780-8721

Pep Boys #690
10831 Magnolia Ave.
(951) 354-0100

Raceway Ford
5900 Sycamore Canyon Blvd.
(951) 784-1000

Raceway Nissan
6030 Sycamore Canyon Blvd.
(951) 571-9300

Riverside Mitsubishi and Kia
8100 Auto Dr.
(951) 509-1000

Used Oil and Filters

Riverside Nissan
8330 Indiana Ave.
(951) 509-6581

Singh Chevrolet
8200 Auto Center Dr.
(951) 688-8111

Spoiled
2634 E. Alessandro Blvd.
(951) 656-2300

Toyota of Riverside
7870 Indiana Ave.
(951) 687-1622

Valvoline Instant Oil Change
3504 Central Ave.
(951) 367-0411

Valvoline Instant Oil Change
7450 Mission Grove Pkwy. South
(951) 780-2500

Valvoline Instant Oil Change
7437 Arlington Ave.
(951) 689-7805

Valvoline Instant Oil Change
3417 Arlington Ave.
(951) 788-7725

Valvoline Instant Oil Change
18681 Van Buren Blvd.
(951) 789-2882

Valvoline Instant Oil Change
3335 Iowa Blvd.
(951) 367-0147

Walters Mercedes-Benz
3213 Adam's St.
(888) 656-3915

Walters Porsche/Audi
3210 Adams St.
(888) 656-3915

Curbside pickup of used oil is available in some cities in Riverside County. Contact your waste hauler for more information. Waste hauler contact information is provided on the back page of this guide.

CalRecycle

You may not need to change your oil every 3000 miles! Save time, money, and the environment by visiting **www.checkyournumber.org** to find out what your manufacturer recommended oil change interval is. Check your number is provided by CalRecycle.

Locations marked with a **also accept oil filters.**

Please DO NOT drop off oil when the location is closed. **For more information about used oil collection centers call 800-350-4OIL.**

Household Hazardous Waste

Examples of household waste that are considered hazardous include:

- Batteries (all types)
- Electronic Waste
- Paint
- Used Oil and Antifreeze
- Sharps/ Needles

Permanent Household Hazardous Waste Collection Centers

Lake Elsinore Area (Closed January and December)

Lake Elsinore Regional Permanent HHW Collection Facility
512 N. Langstaff Street, Lake Elsinore, 92530
Open first Saturday of the month*, 9:00 a.m. to 2:00 p.m.
*Except holiday weekends and during inclement weather.

Riverside Area

Agua Mansa Regional Permanent HHW Collection Facility
1780 Agua Mansa Road, Riverside, 92509
Open non-holiday Saturdays*, 9:00 a.m. to 2:00 p.m.
*Except during inclement weather.

Regional ABOP Collection Centers (Antifreeze, Batteries, Oil and Oil Filters, and Latex Paint ONLY)

Murrieta Area

County Road Yard
25315 Jefferson Avenue, Murrieta, 92562
Open non-holiday Saturdays, 9:00 a.m. to 2:00 p.m.

Beaumont / Banning Area

Lamb Canyon Landfill
16411 Lamb Canyon Rd, Beaumont, 92223
Open non-holiday Saturdays, 9:00 a.m. to 2:00 p.m.

These sites accept residential waste only. For more information, contact the Riverside County Household Hazardous Waste Department Hotline at **800-304-2226 or 951-486-3200, or visit:**
www.rivcowm.org/opencms/hhw/index.html

Household Hazardous Waste

Below is a list of materials accepted at permanent HHW collection sites.*

Chemicals and Cleaners

Adhesives
Air Freshener
Aluminum Cleaners
Ammonia
Antifreeze
Brake Fluid
Carburetor Cleaner
Caulking
Chlorine Bleach
Chrome Polish
Disinfectant
Drain Cleaner
Engine Degreaser
Fertilizer
Fiberglass and Resins
Flea Powder
Floor / Surface Cleaners
Fungicides
Furniture Polish
Gas / Diesel Fuel
Glue
Gun Cleaner
Hair Dye
Hobby Chemicals
Insecticides / Pesticides
Kerosene / Lamp Oil
Lighter Fluid
Motor Oil
Mercury Devices
Oven Cleaner
Paint - Latex / Oil Based
Paint Stripper / Thinner
Photo Chemicals
Pool / Spa Chemicals
Rodent Bait / Poison
Roof Coating
Shoe Dye
Spot Remover
Transmission Fluid
Turpentine
Varnish
Weed Killer / Herbicide
Wood Preservative

Aerosols and Tanks

Aerosol Insecticides
Aerosol Cans
BBQ Propane Tanks
Camp Propane Tanks

E-Waste and Batteries

Batteries (all types)
Electronic Devices
Fluorescent Bulbs / Tubes
Old TVs and Computers

Medical Waste

Sharps / Needles

Please DO NOT bring the following types of materials (If you have any of these wastes please call (951) 486-3200):

Unacceptable Materials

Business, Non-Profit, or Out-of-County Waste
Explosives / Ammunition
Radioactive or Remediation Materials
Medical / Infectious Waste (Except Sharps)
Asbestos
Appliances
Tires
55 or 30 Gallon Drums
Compressed Gas Cylinders >40 lbs
Trash

*Maximum Chemical Load: 5 Gallons or 50lbs per trip. Residential waste only, no business waste accepted.

Recycling

What can go into your curbside recycling bins? Not sure what you can recycle? Check out the list below.

Paper and Cardboard

- Books and Coloring Books
- Cardboard
- Cardstock and Construction Paper
- Office Paper
- Egg Cartons
- Clean Food Boxes
- Junk Mail and Envelopes
- Magazines and Newspapers
- Notebook Paper
- Paper Bags
- Telephone Books

Metal

- Aluminum and Steel Cans
- Clean Aluminum Foil
- Scrap Metal

Glass Jars and Bottles

- Glass Jars
- Beverage Bottles

Plastic Bottles and Grocery Bags

- Plastic Milk Jugs
- Plastic Beverage Containers
- Plastic Grocery Bags

Recycling

Used Tires

Used tires are accepted at various locations in Riverside County. There is generally a fee to dispose of tires. The following locations accept tires:

Badlands Landfill

31125 Ironwood Ave., Moreno Valley, 92553

Lamb Canyon Landfill

16411 Lamb Canyon Rd., Beaumont, 92223

Visit www.rivcowm.org/opencms/landfill_info/landfill_fees.html for information on current landfill pricing.

BAS Recycling, Inc.

14050 Day St., Moreno Valley, 92553
(909) 383-7050
Call facility for pricing.

Electronic Waste Recyclers

Badlands, Lamb Canyon, and El Sobrante Landfills accept up to 2 CRT devices (e.g. computer monitors or TVs) per day for recycling at **no cost** during operating hours. The following recyclers also accept electronic waste:

Gold'n West Surplus, Corona - (951) 371-2020
Graebel Los Angeles Movers, Corona - (800) 373-6552
WM Recycle America, Jurupa Valley - (951) 681-4297
Waste Management, Inc., Moreno Valley - (951) 242-0421
Your Neighborhood Recycling, Moreno Valley - (951) 796-7673
1-800-GOT-JUNK, Riverside - (909) 425-9722

Other Recycling Facilities

For a complete list of recycling facilities visit www.calrecycle.ca.gov .

Earth911.com also provides valuable information and resources about recycling and recycling facilities.

Reycling Centers

What should you do with those empty cans and bottles? Below is a list of centers that accept beverage containers for recycling*.

Banning

Banning Recycling
284 S. 8th St.
(951) 922-9236

Ramsey Recyling
1243 E. Ramsey St.
(951) 849-5997

Calimesa

rePlanet
1155 Calimesa Blvd.
(877) 737-5263

Corona

NexCycle
535 N. McKinley St.
(800) 969-2020

rePlanet
260 W. Foothill Pkwy.
(951) 520-1700

rePlanet
1193 Magnolia Ave.
(877) 737-5263

rePlanet
1288 Border Ave.
(877) 737-5263

Sanchez Recycling Inc.
1130 W. 6th St.
(714) 793-9934

Six Pac Recycling
1430 E. 6th St.
(951) 734-2910

Eastvale

rePlanet
7070 Archibald Ave.
(951) 520-1700

rePlanet
12660 Limonite Ave.
(951) 520-1700

Jurupa Valley

Etiwanda Recycling
6102 Etiwanda Ave.
(951) 263-6173

Recycle Kingdom
4868 Etiwanda Ave.
(626) 617-1859

rePlanet
11070 Limonite Ave.
(877) 737-5263

Salazar's Recycler
5666 Etiwanda Ave.
(951) 966-6408

EarthWize Recycling
9075 Mission Blvd.
(909) 933-2773

Jurupa Valley Recycling Collection Center
6315 Pedley Rd.
(951) 681-0382

Pedley Recycling Center
7850 Limonite Ave.
(951) 823-1383

Pedley Vet Recycling
8980 Limonite Ave.
(909) 856-9053

Recycling Services Centers
6565 Mission Blvd.
(951) 685-4430

Renovate Recycling Center
8800 Limonite Ave.
(714) 453-7028

rePlanet
9155 Jurupa Rd.
(877) 737-5263

Rubidoux Recycling Center
5675 Mission Blvd.
(951) 823-1353

Moreno Valley

EarthWize Recycling
24525 Alessandro Blvd.
(909) 923-2773

Menlo Recycling Center
22405 Goldencrest Dr.
Bldg., A.
(951) 653-5565

Moreno Valley Recycling
22862 Alessandro Blvd.
(323) 732-9253

Moreno Valley Recycling 2
24135 Sunnymead Blvd.
(213) 625-8165

Moreno Valley Recycling 3
14940 Perris Blvd.
(323) 732-9253

Recycling Centers

rePlanet
23575 Sunnymead Ranch Pkwy.
(951) 520-1700

rePlanet
27100 Eucalyptus Ave.
(951) 520-1700

rePlanet
25900 Iris Ave.
(951) 520-1700

Smittys
25073 Sunnymead Blvd., #D-14
(951) 453-0806

Worasing Recycling
15928 Perris Blvd.
(951) 323-7532

Zuniga Recycling
21524 Dracea Ave.
(866) 718-7150

Norco

E&M Recycling
1943 River Rd.
(323) 732-9253

Norco Feed and Recycling
4409 California Ave.
(877) 247-6923

rePlanet
2790 Hamner Ave.
(877) 737-5263

Riverside

AAA Recycle
5490 26th St.
(951) 781-8046

ABC
10330 Hole Ave., #B-9
(909) 742-7129

Cash 4 Cans
7633 Cypress Ave.
(951) 352-5995

El Taray Recycling
12702 Magnolia Ave., #11
(714) 222-4047

rePlanet
4250 Van Buren Blvd.
(951) 520-1700

rePlanet
6155 Magnolia Ave.
(951) 520-1700

rePlanet
5225 Canyon Crest Dr.
(951) 520-1700

rePlanet
315 E. Alessandro Blvd.
(951) 520-1700

rePlanet
3900 Chicago Ave.
(951) 520-1700

rePlanet
2995 Iowa Ave.
(951) 520-1700

rePlanet
6160 Arlington Ave.
(951) 520-1700

rePlanet
9225 Magnolia Ave.
(951) 520-1700

rePlanet
17050 Van Buren Blvd.
(951) 520-1700

rePlanet
3420 La Sierra Ave.
(951) 520-1700

rePlanet
4680 La Sierra Ave.
(951) 520-1700

Riverside Scrap Iron and Metal Corp.
2993 6th St.
(951) 686-2129

Robert A. Nelson Transfer Station
1830 Agua Mansa Rd.
(951) 786-0639

rePlanet
4250 Van Buren Blvd.
(951) 520-1700

*Some recycling centers may accept other recyclable materials. It is advisable to call the center and confirm this, as well as operating hours, before visiting.

Fore more information about local recycling centers visit the **CalRecycle** website: **www.calrecycle.ca.gov.**

Types of Plastic

Confused about the types of plastic and if they can be recycled? Many plastic containers display an identification code that indicates what they are made from. Below are the 7 codes.

#1: Polyethylene Terephthalate (PETE or PET)
Used to create 2-liter soda bottles, water bottles, cooking oil bottles, peanut butter jars.
The most commonly accepted plastic for recycling.

#2: High Density Polyethylene
Used to create detergent bottles, milk and water jugs, grocery bags, yogurt cups.
Commonly accepted for recycling. Bags can be recycled at some large grocery stores.

#3: Polyvinyl Chloride
Used to create plastic pipes, outdoor furniture, shrink-wrap, liquid detergent containers, flooring, showercurtains.
Not currently accepted for recycling.

#4: Low Density Polyethylene
Used to create food storage containers, cellophane wrap, dry cleaning bags, produce bags, trash can liners.
Not commonly recycled, some large grocery stores accept LDPE bags.

#5: Polypropylene
Used to create ketchup bottles, aerosol caps, drinking straws, yogurt containers.
Not commonly accepted for recycling.

#6: Polystyrene
Also known as “Styrofoam.” Used to make coffee cups, take-out food packaging, egg cartons, and packaging “peanuts.”
Sometimes accepted for recycling and made into the same products.

#7: Other
All other plastic resins or a mixture of resins used to make reusable water bottles, Tupperware, biodegradable and compostable plastics.
Not commonly accepted for recycling.

Composting Basics

Got food scraps and yardwaste? Below is a quick guide to Backyard Composting.

1. Select a good spot for composting

- Sun or shade
- Convenient to kitchen or garden, and close to a source of water
- Keep away from structures and wood, as moisture can hasten decay
- Place only on bare ground, as organisms from soil are needed

2. Know the Ingredients

Nitrogen - Green materials - grass clippings, fresh leaves and twigs, vegetable and fruit trimmings, coffee grounds and filters, and non-meat eating animal manures.

Carbon - Brown materials that have released their nitrogen - dry and brittle leaves and grasses, straw, wood chips, corn stalks, shredded newspaper, paper towels, napkins, and cardboard.

Water - The correct moisture level should be about the same as a damp wrung out sponge. A few drops should fall when squeezed in your hand.

Air - Oxygen is very important to the bacteria, fungi, and microorganisms that are working in the pile to breakdown the organic material.

Do Not Add - Meat, dairy products, fats, oils, waste from meat eating animals (dogs and cats), thorny plant material, or diseased plant material.

2. Know the Methods

Aerobic - Pile equal parts green and brown material on ground or in a bin in a 3'x3'x3' heap, water well, and cover with a tarp, carpet or opaque plastic sheet. The pile will heat up (120 to 160 degrees), and needs to be turned after a few days, once it has cooled. Turn the pile weekly and continue composting until the pile has a dark rich look like chocolate cake and the things you put in don't look like their original form. After the compost is done, water well, cover, and let it rest for one to two weeks to make sure it is completely done and the nitrogen has a chance to stabilize. If the compost is used too soon it could rob nutrients from the surrounding plants. Remove large chunks and add them to the next compost pile.

Anerobic - Similar to the Aerobic method, but there is no need to actively turn the material. It may take longer (1-2 years), but is still beneficial to your garden. Just pile the stuff, water, cover, and wait.

For more detailed information on composting, free workshops, or other methods, such as **Vermicomposting,** visit www.rivcowm.org and search for composting.

Source Reduction

The best way to reduce waste is to prevent it!

Buy Responsibly

Reduce packaging waste - Look for products that reduce packaging, or purchase in bulk to reduce the amount of packaging needed.

Look for products containing recycled material - Recycled paper products, motor oil, and even pens and pencils are just a few examples of products that reduce waste.

Consider reusable products - Buy reusable water bottles and sturdy utensils and plates that can be washed and used again.

Get it "For Here," or bring your own - Many coffee shops will provide drinks to their customers in ceramic mugs rather than paper cups if requested. Just ask! Reusable tumblers are also a great alternative to paper cups, and many establishments will even give a small discount to those who bring their own!

Borrow, rent, or share - Why buy something if you are only going to use it once? Items such as tools, party decorations, and even newspapers and magazines can be shared with your friends, family, and/or community.

Purchase rebuilt, remanufactured, or refurbished - Many electronics such as cell phones, computers, and media players can be purchased "refurbished" at a sometimes substantial price reduction. This conserves the resources needed to manufacture a new product.

Choose Non-Toxic

Choose products that contain only non-toxic materials, or try one of these **homemade alternatives**:

- Instead of glass cleaner, dilute 1 cup of vinegar in 1 quart of water.
- To open clogged drains, flush with a mixture of boiling water, and equal parts baking soda and vinegar.

For more information on non-toxic alternatives, visit the California Coastal Commission website:
http://www.coastal.ca.gov/ccbn/lesstoxic.html

Source Reduction

Plastic bags and junk mail contribute to a significant amount of un-needed waste. You can lessen their impact by Reducing, Reusing, and Recycling.

Plastic Bags

Reduce: BYOB (Bring Your Own Bag) - Use reusable canvas or cloth bags rather than plastic bags, and keep them in your car. Not all items need a bag, just say "no, thank you."

Reuse - Plastic grocery bags can serve multiple purposes, such as trash can liners or for pet waste.

Recycle - If you find that you must use a plastic bag, recycle it when you are finished. Most large supermarkets and pharmacies offer free recycling of plastic bags.

Junk Mail Reduction

You can reduce the amount of unwanted junk mail in your mailbox by simply mailing a postcard to the following addresses, requesting your name be removed from their mailing list. Be sure to include your full name, your address(es), your signature, and the date.

Mail Preference Service
Attn.: Dept. 10088342
PO Box 282
Carmel, NY 10512

ADVO
Consumer Assistance
PO Box 249
Windsor, CT 06095

Harte-Hanks Circulation
C/O Pennysaver
2830 Orbiter St.
Brea, CA 92821

Valpak Direct Marketing Systems, Inc.
8605 Largo Lakes Dr.
Largo, FL 33773

Credit Card Junk Mail
Call (888)5-OPT OUT (888-567-8688)

City / County Resources

City of Banning - Recycling and Waste Hauling Information | (951) 922-3105
http://www.ci.banning.ca.us/index.aspx?NID=380

City of Calimesa - Public Works / Engineering Department | (909) 795-9801
http://www.cityofcalimesa.net/publicworks.htm

City of Corona - Trash and Recycling | (951) 736-2400
http://www.discovercorona.com/city-departments/public-works/refuse-and-recycling.aspx

City of Eastvale - Recycling / Solid Waste / Street Sweeping | (951) 361-0900
http://www.eastvalecity.org/index.aspx?page=140

City of Jurupa Valley - Local Resources | (951) 358-7387
http://www.jurupavalley.org/resources.php

City of Moreno Valley - Waste Disposal and Recycling | (951) 413-3100
http://www.moreno-valley.ca.us/resident_services/waste/index-waste.shtml

City of Norco - Trash / Recycling | (951) 270-5656
http://www.norco.ca.us/about/welcome_residents/trash_recycling.asp

City of Riverside - Trash & Recycling | (951) 826-5311
http://www.riversideca.gov/trash

County of Riverside - Riverside County Waste Management Department
http://www.rivcowm.org | (951) 486-3200

Western Riverside Council of Governments
http://www.wrcog.cog.ca.us | (800) 350-4645

Waste Haulers

Waste Management, Inc. - (951) 280-5400 - www.wm.com
Serves: All Cities

Burrtec - (951) 786-9660 - www.burrtec.com
Serves: Eastvale, Jurupa Valley, and Riverside

Athens - (888) 336-6100 - www.athensservices.com
Serves: Riverside

CR&R Disposal - (951) 943-1991 - www.crrwasteservices.com
Serves: Riverside

The Complete Guide to Residential Recyling is sponsored by:

Printed on recycled paper.

IRRIGATION RUNOFF

STORMWATER FACT SHEET

Report Irrigation Runoff or Stormwater Pollution:
800.506.2555

RIVERSIDE COUNTY
WATERSHED PROTECTION

OVERWATERING

Overwatering causes irrigation runoff that may contain pollutants such as pesticides, herbicides, fertilizers, pet waste, yard waste, and sediments which can be hazardous to residents and harmful to our environment. Runoff can also serve as a transport mechanism for other pollutants already on the ground or in the curb gutter. Irrigation runoff entering the storm drain system is an illicit discharge.

BEST PRACTICES

Urban runoff begins when yards and landscaped areas are over-irrigated. Irrigation systems require regular maintenance and visual inspection of the system should be performed to prevent over-spray, leaks, and other problems that result in runoff to storm drains, curbs and gutters.

You can **prevent pollution** by conserving water on your property. Water during cooler times of the day (before 10am and after 6pm).

- Adjust sprinklers to stop overspray and runoff.
- Make needed repairs immediately.
- Use drip irrigation, soaker hoses, or micro-spray systems.
- Use an irrigation timer to pre-set watering times.
- Use a control nozzle or similar mechanism when watering by hand.
- Switch to a water-wise landscape - native plants need less fertilizers, herbicides, pesticides and water.

PROTECT OUR WATERSHED

Many people think that when water flows into a storm drain it is treated, but the storm drain system and the sanitary sewer system are not connected. Everything that enters storm drains flows untreated directly into our creeks, rivers, lakes, beaches and ultimately the ocean. Storm water often contains pollutants, including chemicals, trash, and automobile fluids, all of which pollute our watershed and harm fish and wildlife.

Whether at home or work, you can help reduce pollution and improve water quality by using the above Best Management Practices (BMP's) as part of your daily clean up and maintenance routine.

Stormwater Pollution

What you should know for...

Industrial & Commercial Facilities

Riverside County Stormwater Program Members

City of Banning
(951) 922-3105

City of Beaumont
(951) 769-8520

City of Calimesa
(909) 795-9801

City of Canyon Lake
(951) 244-2955

City of Cathedral City
(760) 770-0340

City of Coachella
(760) 398-3502

City of Corona
(951) 736-2447

City of Desert Hot Springs
(760) 329-6411

City of Eastvale
(951) 361-0900

City of Hemet
(951) 765-2300

City of Indian Wells
(760) 346-2489

City of Indio
(760) 391-4000

City of Jurupa Valley
(951) 332-6464

City of Lake Elsinore
(951) 674-3124

City of La Quinta
(760) 777-7000

City of Menifee
(951) 672-6777

City of Moreno Valley
(951) 413-3000

City of Murrieta
(951) 304-2489

City of Norco
(951) 270-5607

City of Palm Desert
(760) 346-0611

City of Palm Springs
(760) 323-8299

City of Perris
(951) 943-6100

City of Rancho Mirage
(760) 324-4511

City of Riverside
(951) 826-5311

City of San Jacinto
(951) 487-7330

City of Temecula
(951) 694-6444

City of Wildomar
(951) 677-7751

Coachella Valley Water District
(760) 398-2651

County of Riverside
(951) 955-1000

Riverside County Flood Control District
(951) 955-1200

Best Management Practices (BMPS) for:

- Industrial Facilities
- Commercial Facilities

YOU can prevent Stormwater Pollution following these practices...

Industrial and Commercial Facilities

The Riverside County Stormwater Program has identified a number of Best Management Practices (BMPs) for Industrial and Commercial Facilities. These BMPs control and reduce stormwater pollutants from reaching our storm drain system and ultimately our local water bodies. City and County ordinances require businesses to use these BMPs to protect our water quality. Local cities and the County are required to verify implementation of these BMPs by performing regular facility inspections.

Prohibited Discharges

Discontinue all non-stormwater discharges to the storm drain system. It is *prohibited* to discharge any chemicals, paints, debris, wastes or wastewater into the gutter, street or storm drain.

Outdoor Storage BMPs

- Install covers and secondary containment areas for all hazardous materials and wastes stored outdoors in accordance with County and/or City standards.
- Keep all temporary waste containers covered, at all times when not in use.
- Sweep outdoor areas instead of using a hose or pressure washer.
- Move all process operations including vehicle/equipment maintenance inside of the building or under a covered and contained area.
- Wash equipment and vehicles in a contained and covered wash bay which is closed-loop or connected to a clarifier sized to local standards and discharged to a sanitary sewer or take them to a commercial car wash.

Spills and Clean Up BMPs

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep up the area.
- Clean up spills immediately when they occur, using dry clean up methods such as absorbent materials or sweep followed by proper disposal of materials.
- Always have a spill kit available near chemical loading dock doors and vehicle maintenance and fueling areas.
- Follow your Business Emergency Plan, as filed with the local Fire Department.
- Report all prohibited discharges and non-implementation of BMPs to your local Stormwater Coordinator as listed on the back of this pamphlet.
- Report hazardous materials spills to 951-358-5055 or call after hours to 951-782-2973 or, if an emergency, call the Fire Department's Haz Mat Team at 911.

Plastic Manufacturing Facilities BMPs

AB 258 requires plastic product manufacturers to use BMPs, such as safe storage and clean-up procedures to prevent plastic pellets (nurdles) from entering the waterway. The plastic pellets are released into the environment during transporting, packaging and processing and migrate to waterways through the storm drain system. AB 258 will help protect fish and wildlife from the hazards of plastic pollution.

Training BMPs

As prescribed by your City and County Stormwater Ordinance(s), train employees in spill procedures and prohibit non-stormwater discharges to the storm drain system. Applicable BMP examples can be found at www.cabmphandbooks.com.

Permitting

Stormwater discharges associated with specific categories for industrial facilities are regulated by the State Water Resources Control Board through an Industrial Stormwater General Permit. A copy of this General Permit and application forms are available at: www.waterboards.ca.gov, select stormwater then the industrial quick link.

To report illegal dumping or for more information on stormwater pollution prevention call: 1-800-506-2555 or e-mail us at: fcnpdes@rcflood.org.

Caltrans

I Pledge to Protect Every Drop

ILLEGAL DUMPING IS RUBBISH

Properly dump your garbage to reduce California's stormwater pollution!
Five easy tips to reduce pollutants:

APPLIANCES

When illegally dumped, appliances can release toxins that get washed away with rain and end up in our water bodies, polluting our water.

TIP 1: Donate or recycle appliances.
TIP 2: Properly dispose at your local dump.

FURNITURE

When dumped on the side of the roadway all furniture not only causes a safety hazard, but can also breakdown and get into local water bodies, causing pollution.

TIP 3: Contact local waste management for bulky pick-up or locate a dump for drop-off.

VEGETATION

Improperly dumped vegetation can flow to waterways, creating an imbalance of nitrates in water and thus harm aquatic life.

TIP 4: Tarp loads to reduce biodegradable waste on highways.
TIP 5: Use a green waste bin or consider composting biodegradable waste.

Don't risk a $10k fine & up to 6 months in jail

Simple changes in disposal of rubbish can help keep California's highways, waterways and bodies of water clean!

FOLLOW US ON SOCIAL MEDIA

#ProtectEveryDrop

FIND US ONLINE

www.protecteverydrop.com

We ♥ our Watershed!

A clean and healthy watershed is important to all of us.

Trash, debris, chemicals and other contaminants from business activities often make their way into the Riverside County storm drain system. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife.

Did you know?

There is a difference between storm drains and sewers.

Storm drains capture rainwater and flow directly to our rivers, lakes and streams – untreated.

Sewers capture and collect water from sinks, toilets and floor drains, and then it is processed and treated before it is released into the environment.

For more information about how you can protect our watershed, please visit:
www.rcwatershed.org

Questions?

If you have questions about Best Management Practices, or if you have questions about illicit dumping and stormwater pollution visit the Pollution Prevention website: rcwatershed.org.

For more information on requirements for all retail food facilities go to Riverside County Environmental Health's website: rivcoeh.org

RIVERSIDE COUNTY
WATERSHED PROTECTION

Riverside County Watershed Protection Program is managed by Riverside County Flood Control & Water Conservation District in partnership with 27 Cities, the County of Riverside and the Coachella Valley Water District.

OUR MISSION

"To protect, preserve and enhance the quality of Riverside County watersheds by fostering a community-wide commitment to clean water."

Watershed Protection

Food Service Industry Best Practices

Restaurants
Mobile Food Trucks
Grocery Stores
Bakeries
Delicatessens

Best Kitchen Practices

Recycle Oil & Grease

- Never put oil or grease down the drain. Contain grease and oil by using covered grease storage containers or installing a grease interceptor.
- Never overfill your grease storage container or transport it without a cover.
- Grease control devices must be emptied and cleaned by permitted companies and according to manufacturer's specifications.
- Keep maintenance records on site.
- For a list of oil/grease recycling companies, contact CalRecycle www.calrecycle.ca.gov or contact your local sanitation district.

Managing Spills

- Clean food spills in loading and trash areas by using absorbent materials and sweeping then mopping.
- Discharge mop water into the sewer through a grease interceptor.
- Have spill containment and cleanup kits available.
- To report serious toxic spills, call 911.

Handling Toxic Chemicals

- Dispose of all unwanted toxics materials like cleaners, solvents and detergents through a hazardous waste hauler. These items are not trash!
- Use non-toxic cleaning products whenever possible.
- For information on hazardous waste transporters, call (888) 722-4234.

Dumpster Areas

- Keep dumpster lids closed and the areas around them clean.
- Do not fill with liquid waste or hose them out.
- Call your trash hauler to replace any dumpsters that are damaged or leaking.

Cleaning & Maintenance

- Clean equipment, floor mats, filters and garbage cans in a mop sink, wash rack or floor drain connected to a sanitary sewer.
- Sweep outside areas and put the debris in trash containers DO NOT hose down or sweep into the parking lot or street.
- Outside eating areas and sidewalks may not be hosed down or pressure washed UNLESS the following standards are met:
  - ✓ Use dry cleanup methods prior to any pressure washing – absorbing with kitty litter, sweeping, vacuuming, scraping off dried debris.
  - ✓ Wash waters must be captured for proper disposal: collected waters should be discharged to a sanitary drain.
  - ✓ DO NOT use any chemicals or detergents.
  - ✓ DO NOT wash or pour water in a parking lot, alley, sidewalk or street.

Mobile Food Trucks

- The potential for generating stormwater pollution as part of a mobile food business requires special attention. Cleaning activities are required to be conducted at an approved fixed location with a connection to a sanitary sewer. For more information contact Riverside County Environmental Health at (888) 722-4234.
- Do not discharge wash water into storm drains.
- Clean on a properly equipped wash pad and drain wastewater to a sanitary sewer system.

Food Waste Disposal

- Scrape food waste off of plates, pots and food prep areas and dispose of in the trash.
- Food scraps often contain grease, which can clog sewer pipes and result in costly sewer backups and overflows.
- Never put food waste down the drain.

RECYCLE
USED OIL

CONSTRUCTION SITE BEST MANAGEMENT PRACTICES

THE FOLLOWING BMPs MUST BE PROPERLY USED AT ALL CONSTRUCTION SITES IN RIVERSIDE COUNTY TO PROTECT OUR WATERSHEDS FROM POLLUTION

BMPs must be properly installed and maintained on a year round basis.

Construction sites are prohibited from discharging pollutants into storm drains and introducing pollutants to local waterways, rivers, lakes and streams.
To stay in compliance with the law and keep your project on schedule, make sure your BMPs are in place and properly functioning. Your site must be checked and maintained daily.

Erosion Control

Erosion prevention is the most important measure for keeping sediment onsite during construction.

Wherever possible, rely on erosion controls to keep sediment in place. Minimize the disturbed area to protect natural features and soil. Control stormwater flowing onto and through the project. Phase construction activity and stabilize soils promptly. Prevent erosion by implementing soil stabilization practices such as mulching, surface roughening, permanent or temporary seeding. Perform a walk-through of the site to assess stabilization practices.

Concrete Trucks /Pumpers / Finishers

BMPs such as tarps and gravel bags should be implemented to prevent materials and residue from entering into the storm drain system.

Dumpsters

Always cover dumpsters. Areas around dumpsters should be cleaned daily. Perimeter controls around dumpster area should be provided if pollutants are leaking or discharging from the dumpster. The dumpster must be fully contained on the construction site and not in the right-of-way.

Washout Area

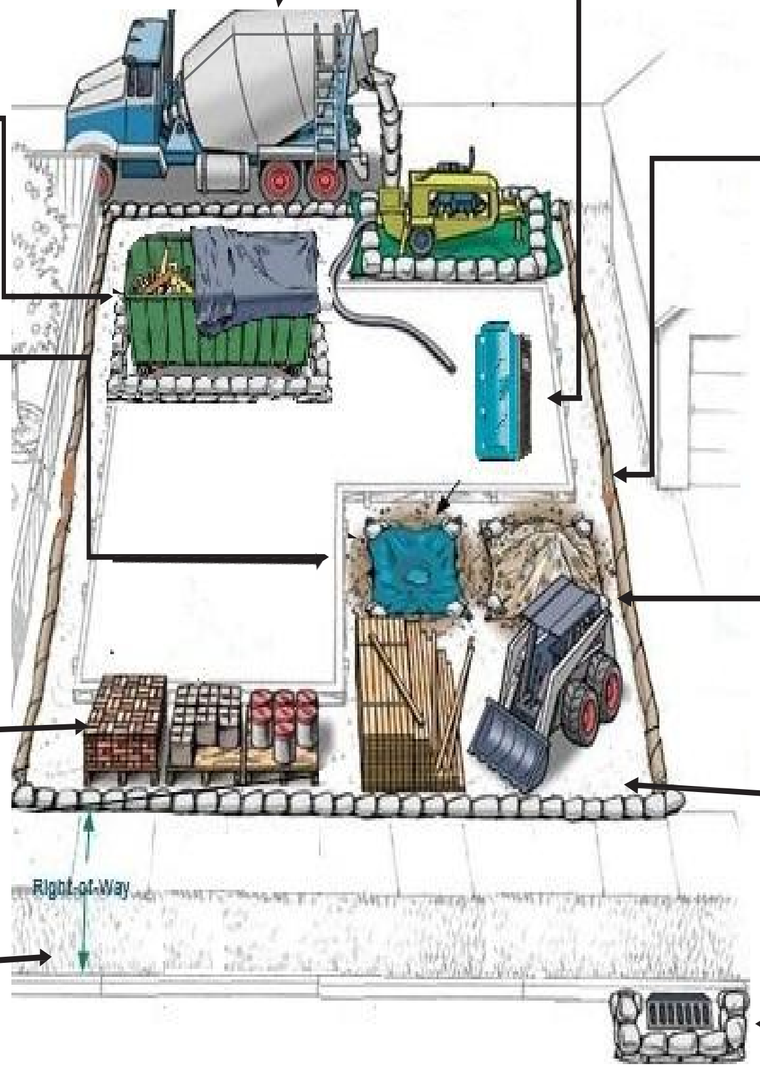
The disposal of "wet" construction materials should be handled in the washout area. This includes paint, stucco, and concrete. Do not wash out paint brushes in the street or dump any residue in the storm drain. Paint brushes and spray guns must be washed out into a hazardous materials drum, or back into the original container and disposed of properly. Washouts should never be in direct contact with the existing ground. Use a berm with an impervious liner to contain wet materials and prevent runoff to nearby areas. The washout area must be checked and maintained daily to ensure compliance. All dried material must be disposed of at a landfill.

Building Materials /Staging Area

Construction material must be stored on site at all times. Building material should always be covered when not in use to prevent dispersal or runoff caused by wind or rain. Flooding must also be prevented by monitoring your site before, during, and after rain events to ensure that BMPs are functioning properly and that there are not any safety issues.

Encroachment Permits

The right-of-way varies from the face of the curb to the private property line. Any construction work within the right-of-way requires an encroachment permit.



Portable Toilets

Portable toilets must be placed on a flat level surface away from any flow line. Portable toilets must have a secondary containment tray. Portable toilets must also be placed behind the curb. Avoid cleaning solutions from coming in contact with the soil.

Perimeter Controls

Perimeter controls are different and separate from erosion controls. Gravel bags, silt fences, and straw wattles are acceptable perimeter controls, and must be used to surround the entire site. Avoid running over perimeter controls with vehicles or heavy equipment to prevent damage to the BMPs. Keep extra absorbent materials and/or wet dry vacuum on site to quickly pick up unintended spills.

Dirt and Grading

Dust control measures shall be implemented during grading operations and throughout all aspects of site development. Mounds of dirt or gravel should be stored on site and sprayed daily with water to prevent excessive dust. The materials should be covered when not in use. For areas that are active and exposed, a wet weather active plan, including additional BMPs, should be in place to protect the site during a rain event. Sites must have a designated entrance/exit with adequate track out controls to prevent the transport of dirt/gravel from the site.

Earthmoving Equipment

Vehicles and earthmoving equipment should be cleaned, fueled and maintained off-site or in a designated contained area. Mud tracks and dirt trails left by equipment leading to and from the site must be cleaned up immediately.

Storm Drains

Storm drains must be protected at all times with perimeter controls, use ¾ inch gravel bags. Sand bags should not be used for inlet protection because they do not permit flow-through. Replace ruptured or damaged gravel bags and remove debris from the right-of-way immediately.

Revised December 2014

Resources

State Water Resources Control Board
Division of Water Quality
1001 I Street
Sacramento CA 95814
(916) 341-5455
www.swrcb.ca.gov/water_issues/programs/stormwater

To report a hazardous materials spill, call:
During normal business hours
(7:00 a.m. to 5:30 p.m.)
Riverside County Department of Environmental Health
(951)-358-5172 or **1-888-722-4234**
www.rivcoeh.org.

After business hours, on weekends or holidays, call **(951)-782-2968**

In an emergency, dial **911**

For hazardous waste disposal information call:

(951) 358-5055

To report an illegal discharge or a clogged storm drain, call:

1-800-506-2555

For more information, please call the Riverside County's "Only Rain Down the Storm Drain" Water Pollution Prevention Program at 1-800-506-2555 or www.rcflood.org

The "Only Rain Down the Storm Drain" Pollution Prevention Program acknowledges The City of Coronado for the information provided in brochure.

Santa Ana Regional Water
Quality Control Board - Region 8
3737 Main Street, Suite 500
Riverside, CA 92501-3348
(951) 782-4130
www.waterboards.ca.gov/santaana

San Diego Regional Water
Quality Control Board - Region 9
2375 Northside Drive Suite 100
San Diego, CA 92108
(619) 516-1990
www.waterboards.ca.gov/sandiego

Colorado River Basin Regional Water
Quality Control Board - Region 7
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260
(760) 346-7491
www.waterboards.ca.gov/coloradoriver

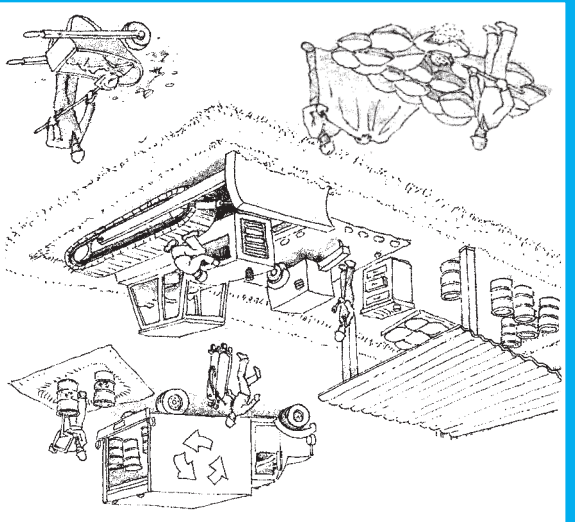
Water Pollution Prevention

What you should know for...

- Developers
- General Contractors
- Home Builders
- Construction Inspectors
- Anyone in the construction business

Best Management Practices (BMPs) for:

GENERAL CONSTRUCTION & SITE SUPERVISION



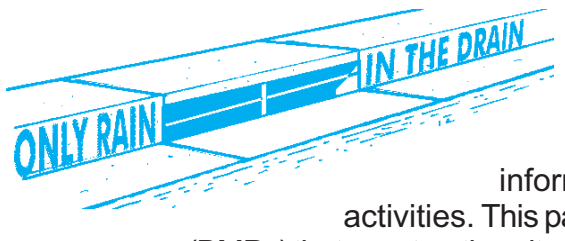
Stormwater Pollution . . . What You Should Know

Riverside County has two drainage systems - sewers and storm drains. The storm drain system was designed to reduce flooding by carrying excess rainwater away from streets and developed areas. The storm drain system does not provide water treatment. It is connected directly to our local waterways.

Unlike sanitary sewers, storm drains are not connected to a wastewater treatment plant – they flow directly to our local streams, rivers and lakes.

Stormwater runoff is a part of the natural hydrologic process. However, land development and construction activities can affect the natural drainage processes and introduce pollutants into stormwater runoff. Polluted stormwater runoff from construction sites has been identified as a major source of water pollution in California. It jeopardizes the quality of our local waterways and can pose a serious threat to the health of our aquatic ecosystems.

The Cities and County of Riverside Water Pollution Prevention Program



Because preventing pollution is much easier and less costly than cleaning up “after the fact,” Cities and County of Riverside's "Only Rain Down the Storm Drain" Water Pollution Prevention Program informs residents and businesses on pollution prevention activities. This pamphlet describes various Best Management Practices (BMPs) that construction site operators can use to prevent stormwater pollution.

In accordance with applicable federal and state law, the Cities and County of Riverside have adopted ordinances for stormwater management that prohibit the discharge of pollutants into the storm drain system or local surface water. This includes discharges from construction sites containing sediment, concrete, mortar, paint, solvents, lubricants, vehicle fluids, fuel, pesticides, and construction debris.

PLEASE NOTE: The Federal, State and local regulations strictly prohibit the discharge of sediment and pollutants into the streets, the storm drain system or waterways. As an owner, operator or supervisor of a construction site, you may be held financially responsible for any environmental damage caused by your subcontractors or employees.

Water Pollution Prevention for Construction Activities

The two most common sources of stormwater pollution problems associated with construction activities are ***erosion*** and ***sedimentation***. Failure to maintain adequate erosion and sediment controls at construction sites often results in sediment discharges into the storm drain system, creating multiple problems once it enters local waterways.

Construction vehicles and heavy equipment can also track significant amounts of mud and sediment onto adjacent streets. Additionally, wind may transport construction materials and wastes into streets storm drains, or directly into our local waterways.

What Should You Do?
Advance Planning to Prevent Pollution

- ❑ Remove existing vegetation only as needed.
- ❑ Schedule excavation, grading, and paving operations for dry weather periods, if possible.
- ❑ Designate a specific area of the construction site, well away from storm drain inlets or watercourses, for material storage and equipment maintenance.
- ❑ Develop and implement an effective combination of erosion and sediment controls for the construction site.
- ❑ Practice source reduction by ordering only the amount of materials that are needed to finish the project.
- ❑ Educate your employees and subcontractors about stormwater management requirements and their pollution prevention responsibilities.
- ❑ Control the amount of surface runoff at the construction site by impeding internally generated flows and using berms or drainage ditches to direct incoming offsite flows to go around the site. ***Note:*** *Consult local drainage policies for more information.*

Best Management Practices

The following Best Management Practices (BMPs) can significantly reduce pollutant discharges from your construction site. Compliance with stormwater regulations can be as simple as minimizing stormwater contact with potential pollutants by providing covers and secondary containment for construction materials, designating areas away from storm drain systems for storing equipment and materials and implementing good housekeeping practices at the construction site.

- ❑ Protect all storm drain inlets and streams located near the construction site to prevent sediment-laden water from entering the storm drain system.
- ❑ Limit access to and from the site. Stabilize construction entrances/exits to minimize the track out of dirt and mud onto adjacent streets. Conduct frequent street sweeping.
- ❑ Protect stockpiles and construction materials from winds and rain by storing them under a roof, secured impermeable tarp or plastic sheeting.
- ❑ Avoid storing or stockpiling materials near storm drain inlets, gullies or streams.
- ❑ Phase grading operations to limit disturbed areas and duration of exposure.
- ❑ Perform major maintenance and repairs of vehicles and equipment offsite.
- ❑ Wash out concrete mixers only in designated washout areas at the construction site.
- ❑ Set-up and operate small concrete mixers on tarps or heavy plastic drop cloths.
- ❑ Keep construction sites clean by removing trash, debris, wastes, etc. on a regular basis.
- ❑ Clean-up spills immediately using dry clean-up methods (e.g., absorbent materials such as cat litter, sand or rags for liquid spills; sweeping for dry spills such as cement, mortar or fertilizer) and by removing the contaminated soil from spills on dirt areas. .
- ❑ Prevent erosion by implementing any or a combination of soil stabilization practices such as mulching, surface roughening, permanent or temporary seeding.
- ❑ Maintain all vehicles and equipment in good working condition. Inspect frequently for leaks, and repair promptly.
- ❑ Practice proper waste disposal. Many construction materials and wastes, including solvents, water-based paint, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation can be recycled. Materials that cannot be recycled must be taken to an appropriate landfill or disposed of as hazardous waste.
- ❑ Cover open dumpsters with secured tarps or plastic sheeting. Never clean out a dumpster by washing it down on the construction site.
- ❑ Arrange for an adequate debris disposal schedule to insure that dumpsters do not overflow.

General Construction Activities Stormwater Permit
(Construction Activities General Permit)

The State Water Resources Control Board (SWRCB) adopted a new Construction Activities General Permit (Order No. 2010-0014-DWQ) on September 2, 2009, This permit is administered and enforced by the SWRCB and the local Regional Water Quality Control Boards (RWQCB). The updated Construction Activities General Permit establishes a number of new stormwater management requirements for construction site operator.

NOTE: *Some construction activies stormwater permits are issued on a regional basis. Consult your local RWQCB to find out if your project requires coverage under any of these permits.*

Frequently Asked Questions:

How do I know if I need a Construction Activities General Permit?

If your construction project requires a land disturbance of one acre or more, or less than one acre but part of a larger common plan of development or sale.

How do I obtain coverage under the Construction Activities General Permit?

The Legally Responsible Person (LRP) must electronically submit Permit Registration Documents (PRDs) prior to commencement of construction activities in the Storm Water Multi-Application Report Tracking System (SMARTS).

PRDs consist of the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, the SWPPP, a signed certification statement by the LRP, and the first annual fee. Once these components have been submitted and are deemed complete by the SMARTS system, a WDID number will automatically be emailed to the LRP.

What must I do to comply with the requirements of the Construction Activities General Permit?

- ● Have a qualified SWPPP Developer (QSD) prepare a Stormwater Pollution Prevention Plan (SWPPP) prior to commencing construction activities.
- ● Have a qualified SWPPP Practitioner (QSP) implement the SWPPP.
- ● Keep a copy of the SWPPP at the construction site for the entire duration of the project.
- ● Implement an effective combination of erosion and sediment control on all soil disturbed areas.
- ● Conduct site inspections prior to anticipated storm events, every 24-hours during extended storm events, and after an actual storm event.
- ● Implement BMPs for non-stormwater discharges year-round.
- ● Perform repair and maintenance of BMPs as soon as possible after storm events depending upon worker safety.
- ● Update the SWPPP as needed, to manage pollutants or reflect changes in site conditions.
- ● Include description of post construction BMPs at the construction site, including parties responsible for long-term maintenance.

NOTE: *Please refer to the Construction Activities General Permit for detailed information. You may contact the SWRCB, your local RWQCB, or visit the SWRCB website at www.swrcb.ca.gov/water_issues/programs/stormwater/ for more information.*

Revised July 2014

Caltrans

I Pledge to Protect Every Drop

ILLEGAL DUMPING IS RUBBISH

Properly dump your garbage to reduce California's stormwater pollution!
Five easy tips to reduce pollutants:

APPLIANCES

When illegally dumped, appliances can release toxins that get washed away with rain and end up in our water bodies, polluting our water.

TIP 1: Donate or recycle appliances.
TIP 2: Properly dispose at your local dump.

FURNITURE

When dumped on the side of the roadway all furniture not only causes a safety hazard, but can also breakdown and get into local water bodies, causing pollution.

TIP 3: Contact local waste management for bulky pick-up or locate a dump for drop-off.

VEGETATION

Improperly dumped vegetation can flow to waterways, creating an imbalance of nitrates in water and thus harm aquatic life.

TIP 4: Tarp loads to reduce biodegradable waste on highways.
TIP 5: Use a green waste bin or consider composting biodegradable waste.

Don't risk a $10k fine & up to 6 months in jail

Simple changes in disposal of rubbish can help keep California's highways, waterways and bodies of water clean!

FOLLOW US ON SOCIAL MEDIA

#ProtectEveryDrop

FIND US ONLINE

www.protecteverydrop.com

Stormwater Pollution

What you should know for...

Industrial & Commercial Facilities

Riverside County Stormwater Program Members

City of Banning
(951) 922-3105

City of Beaumont
(951) 769-8520

City of Calimesa
(909) 795-9801

City of Canyon Lake
(951) 244-2955

City of Cathedral City
(760) 770-0340

City of Coachella
(760) 398-3502

City of Corona
(951) 736-2447

City of Desert Hot Springs
(760) 329-6411

City of Eastvale
(951) 361-0900

City of Hemet
(951) 765-2300

City of Indian Wells
(760) 346-2489

City of Indio
(760) 391-4000

City of Jurupa Valley
(951) 332-6464

City of Lake Elsinore
(951) 674-3124

City of La Quinta
(760) 777-7000

City of Menifee
(951) 672-6777

City of Moreno Valley
(951) 413-3000

City of Murrieta
(951) 304-2489

City of Norco
(951) 270-5607

City of Palm Desert
(760) 346-0611

City of Palm Springs
(760) 323-8299

City of Perris
(951) 943-6100

City of Rancho Mirage
(760) 324-4511

City of Riverside
(951) 826-5311

City of San Jacinto
(951) 487-7330

City of Temecula
(951) 694-6444

City of Wildomar
(951) 677-7751

Coachella Valley Water District
(760) 398-2651

County of Riverside
(951) 955-1000

Riverside County Flood Control District
(951) 955-1200

Best Management Practices (BMPS) for:

- Industrial Facilities
- Commercial Facilities

YOU can prevent Stormwater Pollution following these practices...

Industrial and Commercial Facilities

The Riverside County Stormwater Program has identified a number of Best Management Practices (BMPs) for Industrial and Commercial Facilities. These BMPs control and reduce stormwater pollutants from reaching our storm drain system and ultimately our local water bodies. City and County ordinances require businesses to use these BMPs to protect our water quality. Local cities and the County are required to verify implementation of these BMPs by performing regular facility inspections.

Prohibited Discharges

Discontinue all non-stormwater discharges to the storm drain system. It is *prohibited* to discharge any chemicals, paints, debris, wastes or wastewater into the gutter, street or storm drain.

Outdoor Storage BMPs

- Install covers and secondary containment areas for all hazardous materials and wastes stored outdoors in accordance with County and/or City standards.
- Keep all temporary waste containers covered, at all times when not in use.
- Sweep outdoor areas instead of using a hose or pressure washer.
- Move all process operations including vehicle/equipment maintenance inside of the building or under a covered and contained area.
- Wash equipment and vehicles in a contained and covered wash bay which is closed-loop or connected to a clarifier sized to local standards and discharged to a sanitary sewer or take them to a commercial car wash.

Spills and Clean Up BMPs

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep up the area.
- Clean up spills immediately when they occur, using dry clean up methods such as absorbent materials or sweep followed by proper disposal of materials.
- Always have a spill kit available near chemical loading dock doors and vehicle maintenance and fueling areas.
- Follow your Business Emergency Plan, as filed with the local Fire Department.
- Report all prohibited discharges and non-implementation of BMPs to your local Stormwater Coordinator as listed on the back of this pamphlet.
- Report hazardous materials spills to 951-358-5055 or call after hours to 951-782-2973 or, if an emergency, call the Fire Department's Haz Mat Team at 911.

Plastic Manufacturing Facilities BMPs

AB 258 requires plastic product manufacturers to use BMPs, such as safe storage and clean-up procedures to prevent plastic pellets (nurdles) from entering the waterway. The plastic pellets are released into the environment during transporting, packaging and processing and migrate to waterways through the storm drain system. AB 258 will help protect fish and wildlife from the hazards of plastic pollution.

Training BMPs

As prescribed by your City and County Stormwater Ordinance(s), train employees in spill procedures and prohibit non-stormwater discharges to the storm drain system. Applicable BMP examples can be found at www.cabmphandbooks.com.

Permitting

Stormwater discharges associated with specific categories for industrial facilities are regulated by the State Water Resources Control Board through an Industrial Stormwater General Permit. A copy of this General Permit and application forms are available at: www.waterboards.ca.gov, select stormwater then the industrial quick link.

To report illegal dumping or for more information on stormwater pollution prevention call: 1-800-506-2555 or e-mail us at: fcnpdes@rcflood.org.

IRRIGATION RUNOFF

STORMWATER FACT SHEET

Report Irrigation Runoff or Stormwater Pollution:
800.506.2555

RIVERSIDE COUNTY
WATERSHED PROTECTION

OVERWATERING

Overwatering causes irrigation runoff that may contain pollutants such as pesticides, herbicides, fertilizers, pet waste, yard waste, and sediments which can be hazardous to residents and harmful to our environment. Runoff can also serve as a transport mechanism for other pollutants already on the ground or in the curb gutter. Irrigation runoff entering the storm drain system is an illicit discharge.

BEST PRACTICES

Urban runoff begins when yards and landscaped areas are over-irrigated. Irrigation systems require regular maintenance and visual inspection of the system should be performed to prevent over-spray, leaks, and other problems that result in runoff to storm drains, curbs and gutters.

You can **prevent pollution** by conserving water on your property. Water during cooler times of the day (before 10am and after 6pm).

- Adjust sprinklers to stop overspray and runoff.
- Make needed repairs immediately.
- Use drip irrigation, soaker hoses, or micro-spray systems.
- Use an irrigation timer to pre-set watering times.
- Use a control nozzle or similar mechanism when watering by hand.
- Switch to a water-wise landscape - native plants need less fertilizers, herbicides, pesticides and water.

PROTECT OUR WATERSHED

Many people think that when water flows into a storm drain it is treated, but the storm drain system and the sanitary sewer system are not connected. Everything that enters storm drains flows untreated directly into our creeks, rivers, lakes, beaches and ultimately the ocean. Storm water often contains pollutants, including chemicals, trash, and automobile fluids, all of which pollute our watershed and harm fish and wildlife.

Whether at home or work, you can help reduce pollution and improve water quality by using the above Best Management Practices (BMP's) as part of your daily clean up and maintenance routine.

The Complete Guide to Residential Recycling

Northwest Riverside County

Banning, Calimesa, Corona, Eastvale, Jurupa Valley,
Moreno Valley, Norco, Riverside

Used Oil and Filters

RECYCLE USED OIL

Recycling used motor oil and filters is easy!
Simply take them to one of the certified collection centers below. **It's free!**

Banning

AutoZone
3453-A W. Ramsey St.
(951) 849-7626

Certified Tire & Service Center Goodyear
1820 W. Ramsey St.
(951) 849-5028

Diamond Hills Auto Group
4545 W. Ramsey St.
(951) 849-7861

Cruz Industrial Truck Inc.
313 South Gallaher Way
(951) 849-7861

Corona

AutoZone
501 North McKinley St.
(951) 278-2073

AutoZone
1280 East Ontario Ave.
(951) 273-1583

AutoZone
1014 W. 6th St.
(951) 371-4730

Corona Nissan
2575 Wardlow Rd.
(877) 322-6739

Firestone Store
522 N. Main St.
(951) 735-4101

Goodyear Mountain View Tire
1630 E. Ontario Ave.
(951) 808-0818

Hamner Towing & Service Center
2125 Railroad St.
(951) 734-9331

Heavy Equipment Rentals
13013 Temescal Cyn. Rd.
(951) 609-4623

Jiffy Lube
906 W. 6th St.
(951) 549-9060

Jiffy Lube
1600 E. Ontario Blvd.
(951) 284-0922

O'Reilly Autoparts
1220 Magnolia Ave.
Suite 102
(951) 273-9891

O'Reilly Autoparts
1142 W. 6th St.
(951) 735-0936

Pep Boys
581 N. Main St.
(951) 279-9230

Quality Toyota
1700 W. Sixth St.
(951) 734-6020

Ramona Tire
304 W. Sixth St.
(951) 734-1222

Certified Tire and Service
624 N. Main St.
(951) 284-3443

Certified Tire and Service
2189 Sampson Ave., # 111
(951) 547-2080

Team Dykstra Carwash & Lube Center
2315 California Ave.
(951) 898-6482

Eastvale

Mountain View Tire
6080 Hamner Ave., #105
(909) 484-9497

Autozone
14228 Schleisman Rd.
(951) 898-4712

Jurupa Valley

D & B Automotive and Transmission
4321 Campbell St., #C
(951) 681-6483

Firestone Complete Auto Care
8360 Limonite Ave.
(951) 934-7304

LKQ Pick A Part
3760 Pyrite St.
(800) 749-2720

O'Reilly Autoparts
8702 Limonite Ave.
(951) 685-0822

Used Oil and Filters

RECYCLE
USED OIL FILTERS

You can also find Certified Collection Centers on the Cal Recycle Website:
www.calrecycle.ca.gov/recycle

Scher Goodyear Tire #24
6072 Camino Real
(951) 685-1000

AutoZone
3782 Riverview Dr.
(951) 275-0301

Moreno Valley

Auto Express Moreno Valley
24035 Sunnymead Blvd., #G
(951) 924-6363

AutoZone
27660 Eucalyptus Ave.
(951) 242-5190

AutoZone
16210 Perris Blvd.
(951) 242-2026

AutoZone
24570 Alessandro Blvd.
(951) 242-8439

AutoZone
12601 Perris Blvd.
(951) 242-4353

AutoZone
23510 Sunnymead Blvd.
(951) 924-5460

Buds Moreno Valley Tire Pros
22510 Alessandro Blvd.
(951) 776-7211

Certified Tire & Service Center
16190 Perris Blvd.
(951) 243-5655

Certified Tire & Service Center
23920 Alessandro Blvd., #A
(951) 656-6466

Certified Tire & Service Center
23135 Hemlock Ave.
(951) 369-0025

Firestone
24673 Alessandro Blvd.
(951) 242-6631

Integrity Tire
24901 Sunnymead Blvd.
(951) 656-6466

Moss Bros. Chevrolet
12625 Auto Mall Dr.
(951) 658-3145

Moss Brothers Honda
27910 Eucalyptus Ave.
(951) 486-9366

Moss Brothers Buick, GMC
8146 Auto Drive
(951) 242-2223

Moss Brothers Chrysler Jeep Dodge
27810 Eucalyptus Ave.
(951) 486-9288

Moss Brothers Toyota
12630 Motor Way
(951) 247-8000

Moss Brothers Volkswagen
27750 Eucalyptus Ave.
(951) 485-4188

O'Reilly Autoparts #1304
24021 Alessandro Blvd., #C
(951) 242-0641

O'Reilly Autoparts #1704
12240 Perris Blvd.
(951) 247-5509

Pep Boys #724
23470 Sunnymead Blvd.
(951) 247-4564

Valvoline Instant Oil Change
23165 Hemlock Ave.
(951) 247-1873

Norco

AutoZone #3340
1404 Hamner Ave.
(951) 817-9432

Browning Dodge Chrysler Jeep Ram
1983 Hamner Ave.
(951) 272-3110

Jiffy Lube
2925 Hamner Ave.
(951) 284-0210

Goodyear Mountain View Tire
2935 Hamner Ave.
(877) 872-0133

O'Reilly Autoparts
1050 Hamner Ave.
Suite 1616
(951) 898-1283

Used Oil and Filters

RECYCLE USED OIL

Riverside

Auto Express Riverside
11850 Magnolia Ave.
(951) 351-8875

AutoZone
7315 Indiana Ave.
(951) 637-6701

AutoZone
1947 University Ave.
(951) 788-4013

AutoZone
4195 Van Buren Blvd.
(951) 359-7760

AutoZone
19486 Van Buren Blvd.
(951) 653-5585

AutoZone
10249 Arlington Ave.
(951) 688-0296

AutoZone
6047 Magnolia Ave.
(951) 784-9201

AutoZone
3400 La Sierra Ave.
(951) 354-0781

BMW Of Riverside
3060 Adams St.
(951) 785-4444

Bud's Tire and Wheel
8651 Indiana Ave.
(951) 776-7211

Bud's Tire and Wheel Orangecrest
15967 Wood Rd.
(951) 776-7211

Goodyear Certified Tire & Service Center
8994 Trautwein Rd.
(951) 653-6800

Goodyear Certified Tire & Service Center
7341 Indiana Ave.
(951) 343-8535

Dutton Motor Company
8201 Auto Dr.
(951) 687-2020

Firestone Store
4199 Market St.
(951) 289-7811

Firestone Store
10091 Magnolia Ave.
(951) 977-5863

George Fritts Auto Repair
91 Commercial Ave.
(951) 788-9043

Jiffy Lube
3693 La Sierra Ave.
(951) 359-8999

Malcolm Smith Motorsports
7599 Indiana Ave.
(951) 687-1300

Moss Motors Dodge
8151 Auto Center Dr.
(951) 688-6200

O'Reilly Autoparts
6160 Arlington Ave.
(951) 689-0944

O'Reilly Autoparts
3790 Jurupa Ave.
(951) 682-6082

O'Reilly Autoparts
1691 University Ave.
(951) 222-2900

O'Reilly Autoparts
9929 Magnolia Ave.
(951) 359-3041

O'Reilly Autoparts
18570 Van Buren Blvd.
(951) 780-8721

Pep Boys #690
10831 Magnolia Ave.
(951) 354-0100

Raceway Ford
5900 Sycamore Canyon Blvd.
(951) 784-1000

Raceway Nissan
6030 Sycamore Canyon Blvd.
(951) 571-9300

Riverside Mitsubishi and Kia
8100 Auto Dr.
(951) 509-1000

Used Oil and Filters

Riverside Nissan
8330 Indiana Ave.
(951) 509-6581

Singh Chevrolet
8200 Auto Center Dr.
(951) 688-8111

Spoiled
2634 E. Alessandro Blvd.
(951) 656-2300

Toyota of Riverside
7870 Indiana Ave.
(951) 687-1622

Valvoline Instant Oil Change
3504 Central Ave.
(951) 367-0411

Valvoline Instant Oil Change
7450 Mission Grove Pkwy. South
(951) 780-2500

Valvoline Instant Oil Change
7437 Arlington Ave.
(951) 689-7805

Valvoline Instant Oil Change
3417 Arlington Ave.
(951) 788-7725

Valvoline Instant Oil Change
18681 Van Buren Blvd.
(951) 789-2882

Valvoline Instant Oil Change
3335 Iowa Blvd.
(951) 367-0147

Walters Mercedes-Benz
3213 Adam's St.
(888) 656-3915

Walters Porsche/Audi
3210 Adams St.
(888) 656-3915

Curbside pickup of used oil is available in some cities in Riverside County. Contact your waste hauler for more information. Waste hauler contact information is provided on the back page of this guide.

CalRecycle

You may not need to change your oil every 3000 miles! Save time, money, and the environment by visiting **www.checkyournumber.org** to find out what your manufacturer recommended oil change interval is. Check your number is provided by CalRecycle.

Locations marked with a **also accept oil filters.**

Please DO NOT drop off oil when the location is closed. **For more information about used oil collection centers call 800-350-4OIL.**

Household Hazardous Waste

Examples of household waste that are considered hazardous include:

- Batteries (all types)
- Electronic Waste
- Paint
- Used Oil and Antifreeze
- Sharps/ Needles

Permanent Household Hazardous Waste Collection Centers

Lake Elsinore Area (Closed January and December)

Lake Elsinore Regional Permanent HHW Collection Facility
512 N. Langstaff Street, Lake Elsinore, 92530
Open first Saturday of the month*, 9:00 a.m. to 2:00 p.m.
*Except holiday weekends and during inclement weather.

Riverside Area

Agua Mansa Regional Permanent HHW Collection Facility
1780 Agua Mansa Road, Riverside, 92509
Open non-holiday Saturdays*, 9:00 a.m. to 2:00 p.m.
*Except during inclement weather.

Regional ABOP Collection Centers (Antifreeze, Batteries, Oil and Oil Filters, and Latex Paint ONLY)

Murrieta Area

County Road Yard
25315 Jefferson Avenue, Murrieta, 92562
Open non-holiday Saturdays, 9:00 a.m. to 2:00 p.m.

Beaumont / Banning Area

Lamb Canyon Landfill
16411 Lamb Canyon Rd, Beaumont, 92223
Open non-holiday Saturdays, 9:00 a.m. to 2:00 p.m.

These sites accept residential waste only. For more information, contact the Riverside County Household Hazardous Waste Department Hotline at **800-304-2226 or 951-486-3200, or visit:**
www.rivcowm.org/opencms/hhw/index.html

Household Hazardous Waste

Below is a list of materials accepted at permanent HHW collection sites.*

Chemicals and Cleaners

Adhesives
Air Freshener
Aluminum Cleaners
Ammonia
Antifreeze
Brake Fluid
Carburetor Cleaner
Caulking
Chlorine Bleach
Chrome Polish
Disinfectant
Drain Cleaner
Engine Degreaser
Fertilizer
Fiberglass and Resins
Flea Powder
Floor / Surface Cleaners
Fungicides
Furniture Polish
Gas / Diesel Fuel
Glue
Gun Cleaner
Hair Dye
Hobby Chemicals
Insecticides / Pesticides
Kerosene / Lamp Oil
Lighter Fluid
Motor Oil
Mercury Devices
Oven Cleaner
Paint - Latex / Oil Based
Paint Stripper / Thinner
Photo Chemicals
Pool / Spa Chemicals
Rodent Bait / Poison
Roof Coating
Shoe Dye
Spot Remover
Transmission Fluid
Turpentine
Varnish
Weed Killer / Herbicide
Wood Preservative

Aerosols and Tanks

Aerosol Insecticides
Aerosol Cans
BBQ Propane Tanks
Camp Propane Tanks

E-Waste and Batteries

Batteries (all types)
Electronic Devices
Fluorescent Bulbs / Tubes
Old TVs and Computers

Medical Waste

Sharps / Needles

Please DO NOT bring the following types of materials (If you have any of these wastes please call (951) 486-3200):

Unacceptable Materials

Business, Non-Profit, or Out-of-County Waste
Explosives / Ammunition
Radioactive or Remediation Materials
Medical / Infectious Waste (Except Sharps)
Asbestos
Appliances
Tires
55 or 30 Gallon Drums
Compressed Gas Cylinders >40 lbs
Trash

*Maximum Chemical Load: 5 Gallons or 50lbs per trip. Residential waste only, no business waste accepted.

Recycling

What can go into your curbside recycling bins? Not sure what you can recycle? Check out the list below.

Paper and Cardboard

- Books and Coloring Books
- Cardboard
- Cardstock and Construction Paper
- Office Paper
- Egg Cartons
- Clean Food Boxes
- Junk Mail and Envelopes
- Magazines and Newspapers
- Notebook Paper
- Paper Bags
- Telephone Books

Metal

- Aluminum and Steel Cans
- Clean Aluminum Foil
- Scrap Metal

Glass Jars and Bottles

- Glass Jars
- Beverage Bottles

Plastic Bottles and Grocery Bags

- Plastic Milk Jugs
- Plastic Beverage Containers
- Plastic Grocery Bags

Recycling

Used Tires

Used tires are accepted at various locations in Riverside County. There is generally a fee to dispose of tires. The following locations accept tires:

Badlands Landfill

31125 Ironwood Ave., Moreno Valley, 92553

Lamb Canyon Landfill

16411 Lamb Canyon Rd., Beaumont, 92223

Visit www.rivcowm.org/opencms/landfill_info/landfill_fees.html for information on current landfill pricing.

BAS Recycling, Inc.

14050 Day St., Moreno Valley, 92553
(909) 383-7050
Call facility for pricing.

Electronic Waste Recyclers

Badlands, Lamb Canyon, and El Sobrante Landfills accept up to 2 CRT devices (e.g. computer monitors or TVs) per day for recycling at **no cost** during operating hours. The following recyclers also accept electronic waste:

Gold'n West Surplus, Corona - (951) 371-2020
Graebel Los Angeles Movers, Corona - (800) 373-6552
WM Recycle America, Jurupa Valley - (951) 681-4297
Waste Management, Inc., Moreno Valley - (951) 242-0421
Your Neighborhood Recycling, Moreno Valley - (951) 796-7673
1-800-GOT-JUNK, Riverside - (909) 425-9722

Other Recycling Facilities

For a complete list of recycling facilities visit www.calrecycle.ca.gov .

Earth911.com also provides valuable information and resources about recycling and recycling facilities.

Reycling Centers

What should you do with those empty cans and bottles? Below is a list of centers that accept beverage containers for recycling*.

Banning

Banning Recycling
284 S. 8th St.
(951) 922-9236

Ramsey Recyling
1243 E. Ramsey St.
(951) 849-5997

Calimesa

rePlanet
1155 Calimesa Blvd.
(877) 737-5263

Corona

NexCycle
535 N. McKinley St.
(800) 969-2020

rePlanet
260 W. Foothill Pkwy.
(951) 520-1700

rePlanet
1193 Magnolia Ave.
(877) 737-5263

rePlanet
1288 Border Ave.
(877) 737-5263

Sanchez Recycling Inc.
1130 W. 6th St.
(714) 793-9934

Six Pac Recycling
1430 E. 6th St.
(951) 734-2910

Eastvale

rePlanet
7070 Archibald Ave.
(951) 520-1700

rePlanet
12660 Limonite Ave.
(951) 520-1700

Jurupa Valley

Etiwanda Recycling
6102 Etiwanda Ave.
(951) 263-6173

Recycle Kingdom
4868 Etiwanda Ave.
(626) 617-1859

rePlanet
11070 Limonite Ave.
(877) 737-5263

Salazar's Recycler
5666 Etiwanda Ave.
(951) 966-6408

EarthWize Recycling
9075 Mission Blvd.
(909) 933-2773

Jurupa Valley Recycling Collection Center
6315 Pedley Rd.
(951) 681-0382

Pedley Recycling Center
7850 Limonite Ave.
(951) 823-1383

Pedley Vet Recycling
8980 Limonite Ave.
(909) 856-9053

Recycling Services Centers
6565 Mission Blvd.
(951) 685-4430

Renovate Recycling Center
8800 Limonite Ave.
(714) 453-7028

rePlanet
9155 Jurupa Rd.
(877) 737-5263

Rubidoux Recycling Center
5675 Mission Blvd.
(951) 823-1353

Moreno Valley

EarthWize Recycling
24525 Alessandro Blvd.
(909) 923-2773

Menlo Recycling Center
22405 Goldencrest Dr.
Bldg., A.
(951) 653-5565

Moreno Valley Recycling
22862 Alessandro Blvd.
(323) 732-9253

Moreno Valley Recycling 2
24135 Sunnymead Blvd.
(213) 625-8165

Moreno Valley Recycling 3
14940 Perris Blvd.
(323) 732-9253

Recycling Centers

rePlanet
23575 Sunnymead Ranch Pkwy.
(951) 520-1700

rePlanet
27100 Eucalyptus Ave.
(951) 520-1700

rePlanet
25900 Iris Ave.
(951) 520-1700

Smittys
25073 Sunnymead Blvd., #D-14
(951) 453-0806

Worasing Recycling
15928 Perris Blvd.
(951) 323-7532

Zuniga Recycling
21524 Dracea Ave.
(866) 718-7150

Norco

E&M Recycling
1943 River Rd.
(323) 732-9253

Norco Feed and Recycling
4409 California Ave.
(877) 247-6923

rePlanet
2790 Hamner Ave.
(877) 737-5263

Riverside

AAA Recycle
5490 26th St.
(951) 781-8046

ABC
10330 Hole Ave., #B-9
(909) 742-7129

Cash 4 Cans
7633 Cypress Ave.
(951) 352-5995

El Taray Recycling
12702 Magnolia Ave., #11
(714) 222-4047

rePlanet
4250 Van Buren Blvd.
(951) 520-1700

rePlanet
6155 Magnolia Ave.
(951) 520-1700

rePlanet
5225 Canyon Crest Dr.
(951) 520-1700

rePlanet
315 E. Alessandro Blvd.
(951) 520-1700

rePlanet
3900 Chicago Ave.
(951) 520-1700

rePlanet
2995 Iowa Ave.
(951) 520-1700

rePlanet
6160 Arlington Ave.
(951) 520-1700

rePlanet
9225 Magnolia Ave.
(951) 520-1700

rePlanet
17050 Van Buren Blvd.
(951) 520-1700

rePlanet
3420 La Sierra Ave.
(951) 520-1700

rePlanet
4680 La Sierra Ave.
(951) 520-1700

Riverside Scrap Iron and Metal Corp.
2993 6th St.
(951) 686-2129

Robert A. Nelson Transfer Station
1830 Agua Mansa Rd.
(951) 786-0639

rePlanet
4250 Van Buren Blvd.
(951) 520-1700

*Some recycling centers may accept other recyclable materials. It is advisable to call the center and confirm this, as well as operating hours, before visiting.

Fore more information about local recycling centers visit the **CalRecycle** website: **www.calrecycle.ca.gov.**

Types of Plastic

Confused about the types of plastic and if they can be recycled? Many plastic containers display an identification code that indicates what they are made from. Below are the 7 codes.

#1: Polyethylene Terephthalate (PETE or PET)
Used to create 2-liter soda bottles, water bottles, cooking oil bottles, peanut butter jars.
The most commonly accepted plastic for recycling.

#2: High Density Polyethylene
Used to create detergent bottles, milk and water jugs, grocery bags, yogurt cups.
Commonly accepted for recycling. Bags can be recycled at some large grocery stores.

#3: Polyvinyl Chloride
Used to create plastic pipes, outdoor furniture, shrink-wrap, liquid detergent containers, flooring, showercurtains.
Not currently accepted for recycling.

#4: Low Density Polyethylene
Used to create food storage containers, cellophane wrap, dry cleaning bags, produce bags, trash can liners.
Not commonly recycled, some large grocery stores accept LDPE bags.

#5: Polypropylene
Used to create ketchup bottles, aerosol caps, drinking straws, yogurt containers.
Not commonly accepted for recycling.

#6: Polystyrene
Also known as “Styrofoam.” Used to make coffee cups, take-out food packaging, egg cartons, and packaging “peanuts.”
Sometimes accepted for recycling and made into the same products.

#7: Other
All other plastic resins or a mixture of resins used to make reusable water bottles, Tupperware, biodegradable and compostable plastics.
Not commonly accepted for recycling.

Composting Basics

Got food scraps and yardwaste? Below is a quick guide to Backyard Composting.

1. Select a good spot for composting

- Sun or shade
- Convenient to kitchen or garden, and close to a source of water
- Keep away from structures and wood, as moisture can hasten decay
- Place only on bare ground, as organisms from soil are needed

2. Know the Ingredients

Nitrogen - Green materials - grass clippings, fresh leaves and twigs, vegetable and fruit trimmings, coffee grounds and filters, and non-meat eating animal manures.

Carbon - Brown materials that have released their nitrogen - dry and brittle leaves and grasses, straw, wood chips, corn stalks, shredded newspaper, paper towels, napkins, and cardboard.

Water - The correct moisture level should be about the same as a damp wrung out sponge. A few drops should fall when squeezed in your hand.

Air - Oxygen is very important to the bacteria, fungi, and microorganisms that are working in the pile to breakdown the organic material.

Do Not Add - Meat, dairy products, fats, oils, waste from meat eating animals (dogs and cats), thorny plant material, or diseased plant material.

2. Know the Methods

Aerobic - Pile equal parts green and brown material on ground or in a bin in a 3'x3'x3' heap, water well, and cover with a tarp, carpet or opaque plastic sheet. The pile will heat up (120 to 160 degrees), and needs to be turned after a few days, once it has cooled. Turn the pile weekly and continue composting until the pile has a dark rich look like chocolate cake and the things you put in don't look like their original form. After the compost is done, water well, cover, and let it rest for one to two weeks to make sure it is completely done and the nitrogen has a chance to stabilize. If the compost is used too soon it could rob nutrients from the surrounding plants. Remove large chunks and add them to the next compost pile.

Anerobic - Similar to the Aerobic method, but there is no need to actively turn the material. It may take longer (1-2 years), but is still beneficial to your garden. Just pile the stuff, water, cover, and wait.

For more detailed information on composting, free workshops, or other methods, such as **Vermicomposting,** visit www.rivcowm.org and search for composting.

Source Reduction

The best way to reduce waste is to prevent it!

Buy Responsibly

Reduce packaging waste - Look for products that reduce packaging, or purchase in bulk to reduce the amount of packaging needed.

Look for products containing recycled material - Recycled paper products, motor oil, and even pens and pencils are just a few examples of products that reduce waste.

Consider reusable products - Buy reusable water bottles and sturdy utensils and plates that can be washed and used again.

Get it "For Here," or bring your own - Many coffee shops will provide drinks to their customers in ceramic mugs rather than paper cups if requested. Just ask! Reusable tumblers are also a great alternative to paper cups, and many establishments will even give a small discount to those who bring their own!

Borrow, rent, or share - Why buy something if you are only going to use it once? Items such as tools, party decorations, and even newspapers and magazines can be shared with your friends, family, and/or community.

Purchase rebuilt, remanufactured, or refurbished - Many electronics such as cell phones, computers, and media players can be purchased "refurbished" at a sometimes substantial price reduction. This conserves the resources needed to manufacture a new product.

Choose Non-Toxic

Choose products that contain only non-toxic materials, or try one of these **homemade alternatives**:

- Instead of glass cleaner, dilute 1 cup of vinegar in 1 quart of water.
- To open clogged drains, flush with a mixture of boiling water, and equal parts baking soda and vinegar.

For more information on non-toxic alternatives, visit the California Coastal Commission website:
http://www.coastal.ca.gov/ccbn/lesstoxic.html

Source Reduction

Plastic bags and junk mail contribute to a significant amount of un-needed waste. You can lessen their impact by Reducing, Reusing, and Recycling.

Plastic Bags

Reduce: BYOB (Bring Your Own Bag) - Use reusable canvas or cloth bags rather than plastic bags, and keep them in your car. Not all items need a bag, just say "no, thank you."

Reuse - Plastic grocery bags can serve multiple purposes, such as trash can liners or for pet waste.

Recycle - If you find that you must use a plastic bag, recycle it when you are finished. Most large supermarkets and pharmacies offer free recycling of plastic bags.

Junk Mail Reduction

You can reduce the amount of unwanted junk mail in your mailbox by simply mailing a postcard to the following addresses, requesting your name be removed from their mailing list. Be sure to include your full name, your address(es), your signature, and the date.

Mail Preference Service
Attn.: Dept. 10088342
PO Box 282
Carmel, NY 10512

ADVO
Consumer Assistance
PO Box 249
Windsor, CT 06095

Harte-Hanks Circulation
C/O Pennysaver
2830 Orbiter St.
Brea, CA 92821

Valpak Direct Marketing Systems, Inc.
8605 Largo Lakes Dr.
Largo, FL 33773

Credit Card Junk Mail
Call (888)5-OPT OUT (888-567-8688)

City / County Resources

City of Banning - Recycling and Waste Hauling Information | (951) 922-3105
http://www.ci.banning.ca.us/index.aspx?NID=380

City of Calimesa - Public Works / Engineering Department | (909) 795-9801
http://www.cityofcalimesa.net/publicworks.htm

City of Corona - Trash and Recycling | (951) 736-2400
http://www.discovercorona.com/city-departments/public-works/refuse-and-recycling.aspx

City of Eastvale - Recycling / Solid Waste / Street Sweeping | (951) 361-0900
http://www.eastvalecity.org/index.aspx?page=140

City of Jurupa Valley - Local Resources | (951) 358-7387
http://www.jurupavalley.org/resources.php

City of Moreno Valley - Waste Disposal and Recycling | (951) 413-3100
http://www.moreno-valley.ca.us/resident_services/waste/index-waste.shtml

City of Norco - Trash / Recycling | (951) 270-5656
http://www.norco.ca.us/about/welcome_residents/trash_recycling.asp

City of Riverside - Trash & Recycling | (951) 826-5311
http://www.riversideca.gov/trash

County of Riverside - Riverside County Waste Management Department
http://www.rivcowm.org | (951) 486-3200

Western Riverside Council of Governments
http://www.wrcog.cog.ca.us | (800) 350-4645

Waste Haulers

Waste Management, Inc. - (951) 280-5400 - www.wm.com
Serves: All Cities

Burrtec - (951) 786-9660 - www.burrtec.com
Serves: Eastvale, Jurupa Valley, and Riverside

Athens - (888) 336-6100 - www.athensservices.com
Serves: Riverside

CR&R Disposal - (951) 943-1991 - www.crrwasteservices.com
Serves: Riverside

The Complete Guide to Residential Recyling is sponsored by:

Printed on recycled paper.

Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

After the Storm

For more information contact:

or visit
www.epa.gov/npdes/stormwater
www.epa.gov/nps

EPA 833-B-03-002

January 2003

Internet Address (URL) • HTTP://www.epa.gov
Recycled/Recyclable • Printed With Vegetable Oil Based Inks on 100% Postconsumer, Process Chlorine Free Recycled Paper

A Citizen's Guide to Understanding Stormwater

Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

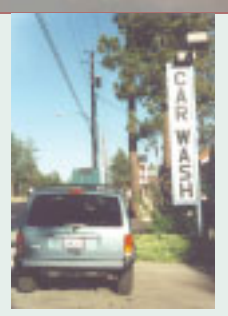
- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Auto care



Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

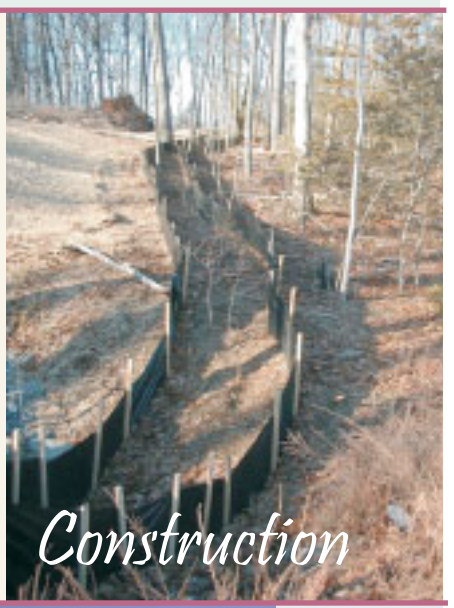
Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



Construction

Agriculture

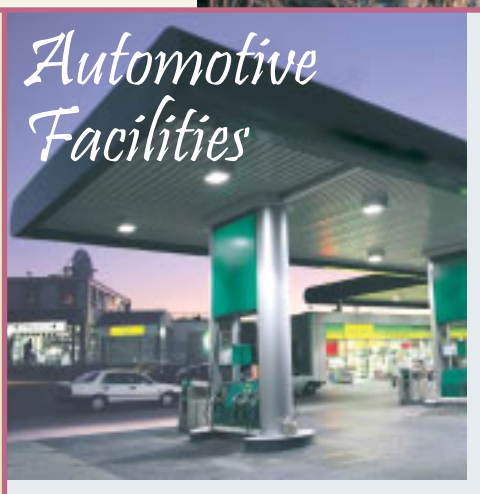
Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.



Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

The Complete Guide to Residential Recycling

Southwest Riverside County

Canyon Lake, Hemet, Lake Elsinore, Menifee, Murrieta, Perris, San Jacinto, Temecula, Wildomar

Used Oil and Filters

Recycling used motor oil and filters is easy!
Simply take them to one of the certified collection centers below. **It's free!**

RECYCLE USED OIL

RECYCLE USED OIL FILTERS

Hemet

AutoZone #2820
1550 W. Florida Ave.
(951) 929-0807

AutoZone #5556
3100 E. Florida Ave.
(951) 652-1308

EZ Lube #112
532 W. Florida Ave.
(951) 766-1996

Firestone Store #2233
350 W. Florida St.
(951) 929-2424

Inland Chevrolet
350 Carriage Circle
(951) 658-4401

Integrity Tire
3223 W. Florida Ave.
(951) 658-3145

Jiffy Lube #3187
330 N Sanderson Ave.
(951) 487-2001

Masterlube #101
3615 W. Florida St.
(951) 766-7055

O'Reilly Autoparts #1332
849 W. Florida Ave.
(951) 929-2210

Pep Boys #866
2050 W. Florida Ave.
(951) 766-1477

Ramona Tire
2350 W. Menlo Ave.
(951) 925-6659

Synfast Oil Change
3615 W. Florida Ave.
(951) 766-7055

Valvoline Instant Oil Change
532 W. Florida Ave.
(951) 766-1996

Idyllwild

Idyllwild Garage
25015 Hwy. 243
(951) 659-2613

Lake Elsinore

AutoZone #5558
30870 Riverside Dr.
(951) 674-7806

AutoZone #5559
32231 Mission Trail
(951) 245-1012

Express Tire
300 Diamond Dr.
(951) 674-0794

EZ Lube #96
29285 Central Ave.
(951) 253-5200

Firestone Store #2238
31748 Mission Trail
(951) 674-0633

Jiffy Lube #2681
311 Summerhill Dr.
(951) 471-8445

O'Reilly Autoparts #1429
31660 Grape St.
(951) 245-8389

Valvoline Instant Oil Change
29285 Central Ave.
(951) 253-5200

Menifee

AutoZone #5561
30123 Antelope Rd.
(951) 301-7240

One Stop Lube & Oil Center
26825 Newport Rd.
(951) 301-7479

Murrieta

AutoZone #5566
40950 California Oaks Rd.
(951) 677-6206

Express Tire
40615 California Oaks Rd.
(951) 696-5200

EZ Lube #115
40430 California Oaks Rd.
(951) 696-2882

Mountain View Tire and Service
27584 Clinton Keith Rd.
(888) 860-0535

Murrieta Volkswagen
41300 Date St.
(951) 634-5434

O'Reilly Autoparts #1430
40951 California Oaks Rd.
(951) 696-2991

Valvoline Instant Oil Change
40430 California Oaks Rd.
(951) 696-2882

Perris

AutoZone #5570
401 E. 4th St.
(951) 657-0696

AutoZone #5571
1675 Perris Blvd.
(951) 943-5998

Jiffy Lube #3294
118 E. Ramona Expressway
(951) 943-2200

Jiffy Lube #3361
3150 Case Rd., Bldg. J.
(951) 284-0922

O'Reilly Autoparts #1046
119 W. Nuevo Rd.
(951) 657-1488

San Jacinto

AutoZone #5581
1540 San Jacinto Ave.
(951) 654-2216

Jiffy Lube #3186
635 S. State St.
(951) 487-2001

Ramona Auto Services, Inc.
2447 S. San Jacinto Ave.
(951) 925-5117

Temecula

AutoZone #5582
31837 US Hwy. 79
(951) 302-8334

AutoZone #5936
40345 Winchester Rd.
(951) 296-3973

DCH Acura of Temecula
26705 Ynez Rd.
(951) 491-2451

Used Oil and Filters

You can also find Certified Collection Centers on the Cal Recycle Website:
www.calrecycle.ca.gov/recycle

Used Oil and Filters

Used Oil and Filters

Temecula

DCH Chrysler Jeep Dodge of Temecula
26845 Ynez Rd.
(951) 491-2151

DCH Honda of Temecula
26755 Ynez Rd.
(951) 491-2351

Express Tire
40915 Winchester Rd.
(951) 296-6699

Express Tire
44092 Margarita Rd.
(951) 302-5033

Express Tire
29095 Front St.
(951) 695-0555

EZ Lube #85
30625 Highway 79 South
(951) 553-7399

Jiffy Lube #1878
30690 Rancho California Rd.
(951) 694-5460

John Hine Temecula Mazda
42050 DLR Dr.
(951) 553-2000

O'Reilly Autoparts #0483
41125 Winchester Rd., #C1
(951) 296-5530

O'Reilly Autoparts #4291
33417 Temecula Pkwy.
(951) 302-1351

Paradise Chevrolet Cadillac
27360 Ynez Rd.
(951) 506-0058

Pep Boys #800
40605 Winchester Rd.
(951) 695-2322

Precision Tune Auto Care
26673 Ynez Rd., #A
(951) 699-6969

Promethean Biofuels Cooperative
27635 Diaz Rd.
(626) 232-7608

Quality Nissan
41895 Motor Car Pkwy.
(951) 676-6601

Ramona Auto Services, Inc.
40385 Winchester Rd.
(951) 719-1600

Ramona Auto Services, Inc.
31955 Via Rio Rd.
(951) 303-3584

Ramona Tire
40385 Winchester Rd.
(951) 719-1600

Rancho Car Wash and Quick Lube
27378 Jefferson Ave.
(951) 296-5644

Temecula Hyundai
27430 Ynez Rd.
(951) 699-6807

Temecula Quick Lube
29764 Rancho California Rd.
(951) 587-6624

Valvoline Instant Oil Change
30625 Highway 79 South
(951) 553-7399

Wildomar

Grease Monkey
32120 Clinton Keith Rd.
(951) 609-3000

Jiffy Lube #3412
32374 Clinton Keith Rd.
(951) 678-5300

Winchester

Mountain View Tire/Goodyear
30664 Benton Rd.
(877) 872-1021

Curbside pickup of used oil is available in some cities in Riverside County. Contact your waste hauler for more information. Waste hauler contact information is provided on the back page of this guide.

You may not need to change your oil every 3000 miles! Save time, money, and the environment by visiting **www.checkyournumber.org** to find out what your manufacturer recommended oil change interval is.

Locations marked with a also accept oil filters.

Please DO NOT drop off oil when the location is closed. **For more information about used oil collection centers call 800-350-4OIL.**

Household Hazardous Waste

Examples of household waste that are considered hazardous include:

- Batteries (all types)
- Electronic Waste
- Paint
- Used Oil and Antifreeze
- Sharps/ Needles

Permanent Household Hazardous Waste Collection Centers

Lake Elsinore Area (Closed January and December)

Lake Elsinore Regional Permanent HHW Collection Facility
512 N. Langstaff Street, Lake Elsinore, 92530
Open first Saturday of the month*, 9:00 a.m. to 2:00 p.m.
*Except holiday weekends and during inclement weather.

Riverside Area

Agua Mansa Regional Permanent HHW Collection Facility
1780 Agua Mansa Road, Riverside, 92509
Open non-holiday Saturdays*, 9:00 a.m. to 2:00 p.m.
*Except during inclement weather.

Regional ABOP Collection Centers (Antifreeze, Batteries, Oil and Oil Filters, and Latex Paint ONLY)

Murrieta Area

County Road Yard
25315 Jefferson Avenue, Murrieta, 92562
Open Non-Holiday Saturdays, 9:00 a.m. to 2:00 p.m.

These sites accept residential waste only. For more information, contact the Riverside County Household Hazardous Waste Department Hotline at **800-304-2226 or 951-486-3200, or visit, www.rivcowm.org/opencms/hhw/index.html**

Household Hazardous Waste

Below is a list of materials accepted at permanent HHW collection sites.*

Chemicals and Cleaners

Adhesives
Air Freshener
Aluminum Cleaners
Ammonia
Antifreeze
Brake Fluid
Carburetor Cleaner
Caulking
Chlorine Bleach
Chrome Polish
Disinfectant
Drain Cleaner
Engine Degreaser
Fertilizer
Fiberglass and Resins
Flea Powder
Floor / Surface Cleaners
Fungicides
Furniture Polish
Gas / Diesel Fuel
Glue
Gun Cleaner
Hair Dye
Hobby Chemicals
Insecticides / Pesticides
Kerosene / Lamp Oil
Lighter Fluid
Motor Oil
Mercury Devices
Oven Cleaner
Paint - Latex / Oil Based
Paint Stripper / Thinner
Photo Chemicals
Pool / Spa Chemicals
Rodent Bait / Poison
Roof Coating
Shoe Dye
Spot Remover
Transmission Fluid
Turpentine
Varnish
Weed Killer / Herbicide
Wood Preservative

Aerosols and Tanks

Aerosol Insecticides
Aerosol Cans
BBQ Propane Tanks
Camp Propane Tanks

E-Waste and Batteries

Batteries (all types)
Electronic Devices
Fluorescent Bulbs / Tubes
Old TVs and Computers

Medical Waste

Sharps / Needles

Please DO NOT bring the following types of materials (If you have any of these wastes please call (951) 486-3200):

Unacceptable Materials

Business, Non-Profit, or Out-of-County Waste
Explosives / Ammunition
Radioactive or Remediation Materials
Medical / Infectious Waste (Except Sharps)
Asbestos
Appliances
Tires
55 or 30 Gallon Drums
Compressed Gas Cylinders >40 lbs
Trash

*Maximum Chemical Load: 5 Gallons or 50lbs per trip. Residential waste only, no business waste accepted.

Recycling

Recycling

What can go into your curbside recycling bins? Not sure what you can recycle? Check out the list below.

Paper and Cardboard

- Books and Coloring Books
- Cardboard
- Cardstock and Construction Paper
- Office Paper
- Egg Cartons
- Clean Food Boxes
- Junk Mail and Envelopes
- Magazines and Newspapers
- Notebook Paper
- Paper Bags
- Telephone Books

Metal

- Aluminum and Steel Cans
- Clean Aluminum Foil
- Scrap Metal

Glass Jars and Bottles

- Glass Jars
- Beverage Bottles

Plastic Bottles and Grocery Bags

- Plastic Milk Jugs
- Plastic Beverage Containers
- Plastic Grocery Bags

Used Tires

Used tires are accepted at various locations in Riverside County. There is generally a fee to dispose of tires. The following locations accept tires:

Badlands Landfill

31125 Ironwood Ave., Moreno Valley, 92553

Lamb Canyon Landfill

16411 Lamb Canyon Rd., Beaumont, 92223

Visit www.rivcowm.org/opencms/landfill_info/landfill_fees.html for information on current landfill pricing.

BAS Recycling, Inc.

14050 Day St., Moreno Valley, 92553
(909) 383-7050
Call facility for pricing.

Electronic Waste Recyclers

Badlands, Lamb Canyon, and El Sobrante Landfills accept up to 2 CRT devices (e.g. computer monitors or TVs) per day for recycling at **no cost** during operating hours. The following recyclers also accept electronic waste:

The Green Guys Recycling, Hemet - (951) 757-9156
Starsurplus.com, Murrieta - (951) 677-5696
XIT Communications, Murrieta - (951) 691-5138
CR&R, Perris - (800) 755-8112
Tire Stop & Recycling, Sun City - (951) 928-9600
GKAT, INC. dba Temecula Recycling, Temecula - (951) 693-1500
Heavy Metal Scrap & Recycling, Inc., Temecula - (951) 693-4677

Other Recycling Facilities

For a complete list of recycling facilities visit www.calrecycle.ca.gov and click on the “Recycle Tab.”
Earth911.com also provides valuable information and resources about recycling and recycling facilities.

Reycling Centers

What should you do with those empty cans and bottles? Below is a list of centers that accept beverage containers for recycling*.

Hemet

EarthWize Recycling
1231 S. Sanderson Ave.
(909) 933-2773

Menlo Recycle Center
445 E. Menlo Ave.
(951) 766-8520

NexCycle
1295 S. State St.
(800) 969-2020

NexCycle
3125 W. Florida Ave.
(800) 969-2020

rePlanet
43396 US Hwy 74
(877) 737-5263

The Green Guys Recycling
100 N. State St., #101
(951) 757-9156

Valley Metals
342 N. Juanita St.
(951) 925-8577

Lake Elsinore

Cans Plus Recycling
29170 Riverside Dr., #1
(951) 245-1178

Downtown Elsinore Recycling
217 N. Main St.
(323) 204-8308

Lake Elsinore Recycling Center
1315 W. Flint St.
(951) 579-4102

Love Earth Recycling
31949 Corydon Rd., #160
(951) 230-6580

NexCycle
31564 Grape St.
(909) 796-2210

rePlanet
32281 Mission Tr.
(951) 520-1700

rePlanet
16750 Lakeshore Dr.
(877) 737-5263

Menifee

rePlanet
30125 Antelope Rd.
(951) 520-1700

rePlanet
25904 Newport Rd.
(877) 737-5263

Neill's Recycling
26026 Sherman Rd.
(951) 514-8656

NexCycle
27220 Sun City Blvd.
(909) 796-2210

Tire Stop and Recycling
27491 Ethanac Rd.
(888) 515-1376

Murrieta

EarthWize Recycling
27826 Clinton Keith Rd.
(909) 933-2773

Go Green Murrieta Recycling
40645 Cal. Oaks Rd.
(818) 220-9540

Murrieta Recycling
38365 Innovation Ct., #1102-1105
(951) 894-3094

rePlanet
40473 Murrieta Hot Springs Rd.
(951) 520-1700

rePlanet
23801 Washington Ave.
(951) 520-1700

rePlanet
4100 Cal. Oaks Rd.
(951) 520-1700

rePlanet
39140 Winchester Ave.
(951) 520-1700

rePlanet
28047 Scott Rd.
(877) 737-5263

SA Recycling
41400 Date St.
(951) 677-8586

Recycling Centers

Perris

A-1
24440 Hwy 74
(951) 940-4224

Ecology Auto Parts
23332 Cajalco Rd.
(951) 657-7725

Go Green Recycling
164 Malbert St., #A-2
(951) 487-5875

Harb Family Market Recycling
22707 San Jacinto Ave.
(951) 657-7733

4th Street Recycling
510 W. 4th St.
(323) 204-8308

Menlo Recycle Center
151 W. 7th St.
(951) 657-8200

RecycleWise
200 Sinclair St. #4
(951) 443-1894

Recycling Depot
1320 W. Oleander Ave.
(951) 442-5221

rePlanet
47 W. Nuevo Rd.
(877) 737-5263

San Jacinto

CA Recycling
762 S. San Jacinto Ave.
(951) 651-0010

rePlanet
1271 N. State St.
(877) 737-5263

San Jacinto Recycling Center
658 W. Esplanade Ave.
(951) 654-1399

Temecula

Heavy Metal Scrap Reycling Inc.
43136 Rancho Way
(951) 693-4677

NexCycle
29530 Rancho California Rd.
(909) 796-2210

NexCycle
26419 Ynez Rd.
(909) 796-2210

rePlanet
30530 Rancho California Rd.
(951) 520-1700

rePlanet
33293 Temecula Pkwy.
(951) 520-1700

rePlanet
31813 Temecula Pkwy.
(877) 737-5263

Temecula Recycling
27635 Diaz Rd., #120
(951) 693-1500

Wildomar

rePlanet
23893 Clinton Keith Rd.
(951) 520-1700

rePlanet
30712 Benton Rd.
(877) 737-5263

*Some recycling centers may accept other recyclable materials. It is advisable to call the center and confirm this, as well as operating hours, before visiting.

Fore more information about local recycling centers visit the **CalRecycle** website: **www.calrecycle.ca.gov.**

Types of Plastic

Confused about the types of plastic and if they can be recycled? Many plastic containers display an identification code that indicates what they are made from. Below are the 7 codes.

#1: Polyethylene Terephthalate (PETE or PET)
Used to create 2-liter soda bottles, water bottles, cooking oil bottles, peanut butter jars.
The most commonly accepted plastic for recycling.

#2: High Density Polyethylene
Used to create detergent bottles, milk and water jugs, grocery bags, yogurt cups.
Commonly accepted for recycling. Bags can be recycled at some large grocery stores.

#3: Polyvinyl Chloride
Used to create plastic pipes, outdoor furniture, shrink-wrap, liquid detergent containers, flooring, showercurtains.
Not currently accepted for recycling.

#4: Low Density Polyethylene
Used to create food storage containers, cellophane wrap, dry cleaning bags, produce bags, trash can liners.
Not commonly recycled, some large grocery stores accept LDPE bags.

#5: Polypropylene
Used to create ketchup bottles, aerosol caps, drinking straws, yogurt containers.
Not commonly accepted for recycling.

#6: Polystyrene
Also known as "Styrofoam." Used to make coffee cups, take-out food packaging, egg cartons, and packaging "peanuts."
Sometimes accepted for recycling and made into the same products.

#7: Other
All other plastic resins or a mixture of resins used to make reusable water bottles, Tupperware, biodegradable and compostable plastics.
Not commonly accepted for recycling.

Composting Basics

Got food scraps and yardwaste? Below is a quick guide to Backyard Composting.

1. Select a good spot for composting

- Sun or shade
- Convenient to kitchen or garden, and close to a source of water
- Keep away from structures and wood, as moisture can hasten decay
- Place only on bare ground, as organisms from soil are needed

2. Know the Ingredients

Nitrogen - Green materials - grass clippings, fresh leaves and twigs, vegetable and fruit trimmings, coffee grounds and filters, and non-meat eating animal manures.

Carbon - Brown materials that have released their nitrogen - dry and brittle leaves and grasses, straw, wood chips, corn stalks, shredded newspaper, paper towels, napkins, and cardboard.

Water - The correct moisture level should be about the same as a damp wrung out sponge. A few drops should fall when squeezed in your hand.

Air - Oxygen is very important to the bacteria, fungi, and microorganisms that are working in the pile to breakdown the organic material.

Do Not Add - Meat, dairy products, fats, oils, waste from meat eating animals (dogs and cats), thorny plant material, or diseased plant material.

2. Know the Methods

Aerobic - Pile equal parts green and brown material on ground or in a bin in a 3'x3'x3' heap, water well, and cover with a tarp, carpet or opaque plastic sheet. The pile will heat up (120 to 160 degrees), and needs to be turned after a few days, once it has cooled. Turn the pile weekly and continue composting until the pile has a dark rich look like chocolate cake and the things you put in don't look like their original form. After the compost is done, water well, cover, and let it rest for one to two weeks to make sure it is completely done and the nitrogen has a chance to stabilize. If the compost is used too soon it could rob nutrients from the surrounding plants. Remove large chunks and add them to the next compost pile.

Anerobic - Similar to the Aerobic method, but there is no need to actively turn the material. It may take longer (1-2 years), but is still beneficial to your garden. Just pile the stuff, water, cover, and wait.

For more detailed information on composting, free workshops, or other methods, such as **Vermicomposting**, visit www.rivcowm.org and search for composting.

Source Reduction

The best way to reduce waste is to prevent it!

Buy Responsibly

Reduce packaging waste - Look for products that reduce packaging, or purchase in bulk to reduce the amount of packaging needed.

Look for products containing recycled material - Recycled paper products, motor oil, and even pens and pencils are just a few examples of products that reduce waste.

Consider reusable products - Buy reusable water bottles and sturdy utensils and plates that can be washed and used again.

Get it "For Here," or bring your own - Many coffee shops will provide drinks to their customers in ceramic mugs rather than paper cups if requested. Just ask! Reusable tumblers are also a great alternative to paper cups, and many establishments will even give a small discount to those who bring their own!

Borrow, rent, or share - Why buy something if you are only going to use it once? Items such as tools, party decorations, and even newspapers and magazines can be shared with your friends, family, and/or community.

Purchase rebuilt, remanufactured, or refurbished - Many electronics such as cell phones, computers, and media players can be purchased "refurbished" at a sometimes substantial price reduction. This conserves the resources needed to manufacture a new product.

Choose Non-Toxic

Choose products that contain only non-toxic materials, or try one of these **homemade alternatives**:

- Instead of glass cleaner, dilute 1 cup of vinegar in 1 quart of water.
- To open clogged drains, flush with a mixture of boiling water, and equal parts baking soda and vinegar.

For more information on non-toxic alternatives, visit the California Coastal Commission website:
http://www.coastal.ca.gov/ccbn/lesstoxic.html

Source Reduction

Plastic bags and junk mail contribute to a significant amount of un-needed waste. You can lessen their impact by Reducing, Reusing, and Recycling.

Plastic Bags

Reduce: BYOB (Bring Your Own Bag) - Use reusable canvas or cloth bags rather than plastic bags, and keep them in your car. Not all items need a bag, just say "no, thank you."

Reuse - Plastic grocery bags can serve multiple purposes, such as trash can liners or for pet waste.

Recycle - If you find that you must use a plastic bag, recycle it when you are finished. Most large supermarkets and pharmacies offer free recycling of plastic bags.

Junk Mail Reduction

You can reduce the amount of unwanted junk mail in your mailbox by simply mailing a postcard to the following addresses, requesting your name be removed from their mailing list. Be sure to include your full name, your address(es), your signature, and the date.

Mail Preference Service
Attn.: Dept. 10088342
PO Box 282
Carmel, NY 10512

ADVO
Consumer Assistance
PO Box 249
Windsor, CT 06095

Harte-Hanks Circulation
C/O Pennysaver
2830 Orbiter St.
Brea, CA 92821

Valpak Direct Marketing Systems, Inc.
8605 Largo Lakes Dr.
Largo, FL 33773

Credit Card Junk Mail
Call (888)5-OPT OUT (888-567-8688)

City / County Resources

City of Canyon Lake - Waste and Recycling | (800) 755-8112
http://www.cityofcanyonlake.com/recycling.asp

City of Hemet - Integrated Waste Management | (951) 765-3712
http://www.cityofhemet.org/index.aspx?nid=93

City of Lake Elsinore - Recycling | (951) 674-3124
http://www.lake-elsinore.org/index.aspx?page=751

City of Menifee - Public Works Department | (951) 672-6777
http://www.cityofmenifee.us/index.aspx?nid=99

City of Murrieta - Trash & Recycling | (951) 461-6007
http://www.murrieta.org/services/trash

City of Perris - Waste & Recycling | (951) 943-6100
http://www.cityofperris.org/residents/waste-recycle.html

City of San Jacinto - Waste & Recycling | (951) 487-7330
http://www.san-jacinto.ca.us/residents/waste.html

City of Temecula - Trash & Recycling | 951-694-6444
http://www.cityoftemecula.org/temecula/residents/trashrecycling/recycling.htm

City of Wildomar - Trash Hauling and Recycling | (951) 677-7751
http://www.cityofwildomar.org/trash-hauling-recycling.asp

County of Riverside - Riverside County Waste Management Department
http://www.rivcowm.org | (951) 486-3200

Western Riverside Council of Governments
http://www.wrcog.cog.ca.us | (800) 350-4645

Waste Haulers

Waste Management, Inc. - (951) 280-5400 - www.wm.com
Serves: Menifee, Murrieta, and Wildomar

CR&R Disposal - (951) 943-1991 - www.crrwasteservices.com
Serves: Canyon Lake, Hemet, Lake Elsinore, Perris, San Jacinto, and Temecula

The Complete Guide to Residential Recyling is sponsored by:

Resources

State Water Resources Control Board
Division of Water Quality
1001 I Street
Sacramento CA 95814
(916) 341-5455
www.swrcb.ca.gov/water_issues/programs/stormwater

To report a hazardous materials spill, call:
During normal business hours
(7:00 a.m. to 5:30 p.m.)
Riverside County Department of Environmental Health
(951)-358-5172 or **1-888-722-4234**
www.rivcoeh.org.

After business hours, on weekends or holidays, call **(951)-782-2968**

In an emergency, dial **911**

For hazardous waste disposal information call:

(951) 358-5055

To report an illegal discharge or a clogged storm drain, call:

1-800-506-2555

For more information, please call the Riverside County's "Only Rain Down the Storm Drain" Water Pollution Prevention Program at 1-800-506-2555 or www.rcflood.org

The "Only Rain Down the Storm Drain" Pollution Prevention Program acknowledges The City of Coronado for the information provided in brochure.

Santa Ana Regional Water
Quality Control Board - Region 8
3737 Main Street, Suite 500
Riverside, CA 92501-3348
(951) 782-4130
www.waterboards.ca.gov/santaana

San Diego Regional Water
Quality Control Board - Region 9
2375 Northside Drive Suite 100
San Diego, CA 92108
(619) 516-1990
www.waterboards.ca.gov/sandiego

Colorado River Basin Regional Water
Quality Control Board - Region 7
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260
(760) 346-7491
www.waterboards.ca.gov/coloradoriver

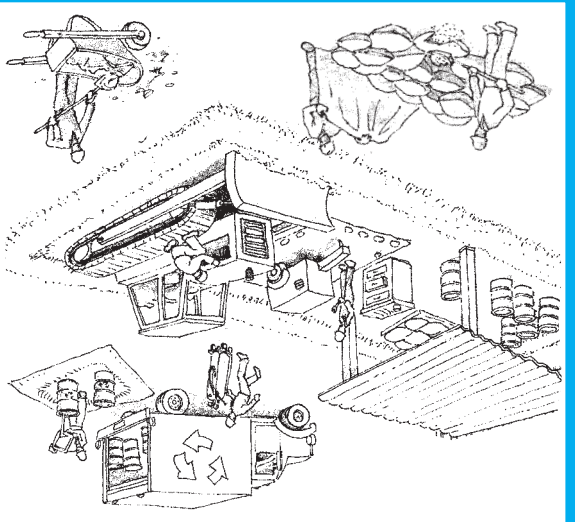
Water Pollution Prevention

What you should know for...

- Developers
- General Contractors
- Home Builders
- Construction Inspectors
- Anyone in the construction business

Best Management Practices (BMPs) for:

GENERAL CONSTRUCTION & SITE SUPERVISION



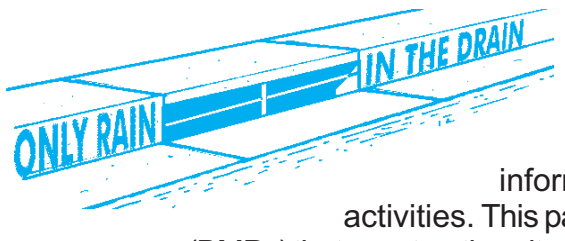
Stormwater Pollution . . . What You Should Know

Riverside County has two drainage systems - sewers and storm drains. The storm drain system was designed to reduce flooding by carrying excess rainwater away from streets and developed areas. The storm drain system does not provide water treatment. It is connected directly to our local waterways.

Unlike sanitary sewers, storm drains are not connected to a wastewater treatment plant – they flow directly to our local streams, rivers and lakes.

Stormwater runoff is a part of the natural hydrologic process. However, land development and construction activities can affect the natural drainage processes and introduce pollutants into stormwater runoff. Polluted stormwater runoff from construction sites has been identified as a major source of water pollution in California. It jeopardizes the quality of our local waterways and can pose a serious threat to the health of our aquatic ecosystems.

The Cities and County of Riverside Water Pollution Prevention Program



Because preventing pollution is much easier and less costly than cleaning up “after the fact,” Cities and County of Riverside's "Only Rain Down the Storm Drain" Water Pollution Prevention Program informs residents and businesses on pollution prevention activities. This pamphlet describes various Best Management Practices (BMPs) that construction site operators can use to prevent stormwater pollution.

In accordance with applicable federal and state law, the Cities and County of Riverside have adopted ordinances for stormwater management that prohibit the discharge of pollutants into the storm drain system or local surface water. This includes discharges from construction sites containing sediment, concrete, mortar, paint, solvents, lubricants, vehicle fluids, fuel, pesticides, and construction debris.

PLEASE NOTE: The Federal, State and local regulations strictly prohibit the discharge of sediment and pollutants into the streets, the storm drain system or waterways. As an owner, operator or supervisor of a construction site, you may be held financially responsible for any environmental damage caused by your subcontractors or employees.

Water Pollution Prevention for Construction Activities

The two most common sources of stormwater pollution problems associated with construction activities are ***erosion*** and ***sedimentation***. Failure to maintain adequate erosion and sediment controls at construction sites often results in sediment discharges into the storm drain system, creating multiple problems once it enters local waterways.

Construction vehicles and heavy equipment can also track significant amounts of mud and sediment onto adjacent streets. Additionally, wind may transport construction materials and wastes into streets storm drains, or directly into our local waterways.

What Should You Do?
Advance Planning to Prevent Pollution

- ❑ Remove existing vegetation only as needed.
- ❑ Schedule excavation, grading, and paving operations for dry weather periods, if possible.
- ❑ Designate a specific area of the construction site, well away from storm drain inlets or watercourses, for material storage and equipment maintenance.
- ❑ Develop and implement an effective combination of erosion and sediment controls for the construction site.
- ❑ Practice source reduction by ordering only the amount of materials that are needed to finish the project.
- ❑ Educate your employees and subcontractors about stormwater management requirements and their pollution prevention responsibilities.
- ❑ Control the amount of surface runoff at the construction site by impeding internally generated flows and using berms or drainage ditches to direct incoming offsite flows to go around the site. ***Note:*** *Consult local drainage policies for more information.*

Best Management Practices

The following Best Management Practices (BMPs) can significantly reduce pollutant discharges from your construction site. Compliance with stormwater regulations can be as simple as minimizing stormwater contact with potential pollutants by providing covers and secondary containment for construction materials, designating areas away from storm drain systems for storing equipment and materials and implementing good housekeeping practices at the construction site.

- ❑ Protect all storm drain inlets and streams located near the construction site to prevent sediment-laden water from entering the storm drain system.
- ❑ Limit access to and from the site. Stabilize construction entrances/exits to minimize the track out of dirt and mud onto adjacent streets. Conduct frequent street sweeping.
- ❑ Protect stockpiles and construction materials from winds and rain by storing them under a roof, secured impermeable tarp or plastic sheeting.
- ❑ Avoid storing or stockpiling materials near storm drain inlets, gullies or streams.
- ❑ Phase grading operations to limit disturbed areas and duration of exposure.
- ❑ Perform major maintenance and repairs of vehicles and equipment offsite.
- ❑ Wash out concrete mixers only in designated washout areas at the construction site.
- ❑ Set-up and operate small concrete mixers on tarps or heavy plastic drop cloths.
- ❑ Keep construction sites clean by removing trash, debris, wastes, etc. on a regular basis.
- ❑ Clean-up spills immediately using dry clean-up methods (e.g., absorbent materials such as cat litter, sand or rags for liquid spills; sweeping for dry spills such as cement, mortar or fertilizer) and by removing the contaminated soil from spills on dirt areas. .
- ❑ Prevent erosion by implementing any or a combination of soil stabilization practices such as mulching, surface roughening, permanent or temporary seeding.
- ❑ Maintain all vehicles and equipment in good working condition. Inspect frequently for leaks, and repair promptly.
- ❑ Practice proper waste disposal. Many construction materials and wastes, including solvents, water-based paint, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation can be recycled. Materials that cannot be recycled must be taken to an appropriate landfill or disposed of as hazardous waste.
- ❑ Cover open dumpsters with secured tarps or plastic sheeting. Never clean out a dumpster by washing it down on the construction site.
- ❑ Arrange for an adequate debris disposal schedule to insure that dumpsters do not overflow.

General Construction Activities Stormwater Permit
(Construction Activities General Permit)

The State Water Resources Control Board (SWRCB) adopted a new Construction Activities General Permit (Order No. 2010-0014-DWQ) on September 2, 2009, This permit is administered and enforced by the SWRCB and the local Regional Water Quality Control Boards (RWQCB). The updated Construction Activities General Permit establishes a number of new stormwater management requirements for construction site operator.

NOTE: *Some construction activies stormwater permits are issued on a regional basis. Consult your local RWQCB to find out if your project requires coverage under any of these permits.*

Frequently Asked Questions:

How do I know if I need a Construction Activities General Permit?

If your construction project requires a land disturbance of one acre or more, or less than one acre but part of a larger common plan of development or sale.

How do I obtain coverage under the Construction Activities General Permit?

The Legally Responsible Person (LRP) must electronically submit Permit Registration Documents (PRDs) prior to commencement of construction activities in the Storm Water Multi-Application Report Tracking System (SMARTS).

PRDs consist of the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, the SWPPP, a signed certification statement by the LRP, and the first annual fee. Once these components have been submitted and are deemed complete by the SMARTS system, a WDID number will automatically be emailed to the LRP.

What must I do to comply with the requirements of the Construction Activities General Permit?

- ● Have a qualified SWPPP Developer (QSD) prepare a Stormwater Pollution Prevention Plan (SWPPP) prior to commencing construction activities.
- ● Have a qualified SWPPP Practitioner (QSP) implement the SWPPP.
- ● Keep a copy of the SWPPP at the construction site for the entire duration of the project.
- ● Implement an effective combination of erosion and sediment control on all soil disturbed areas.
- ● Conduct site inspections prior to anticipated storm events, every 24-hours during extended storm events, and after an actual storm event.
- ● Implement BMPs for non-stormwater discharges year-round.
- ● Perform repair and maintenance of BMPs as soon as possible after storm events depending upon worker safety.
- ● Update the SWPPP as needed, to manage pollutants or reflect changes in site conditions.
- ● Include description of post construction BMPs at the construction site, including parties responsible for long-term maintenance.

NOTE: *Please refer to the Construction Activities General Permit for detailed information. You may contact the SWRCB, your local RWQCB, or visit the SWRCB website at www.swrcb.ca.gov/water_issues/programs/stormwater/ for more information.*

Revised July 2014

CONSTRUCTION SITE BEST MANAGEMENT PRACTICES

THE FOLLOWING BMPs MUST BE PROPERLY USED AT ALL CONSTRUCTION SITES IN RIVERSIDE COUNTY TO PROTECT OUR WATERSHEDS FROM POLLUTION

BMPs must be properly installed and maintained on a year round basis.

Construction sites are prohibited from discharging pollutants into storm drains and introducing pollutants to local waterways, rivers, lakes and streams.
To stay in compliance with the law and keep your project on schedule, make sure your BMPs are in place and properly functioning. Your site must be checked and maintained daily.

Erosion Control

Erosion prevention is the most important measure for keeping sediment onsite during construction.

Wherever possible, rely on erosion controls to keep sediment in place. Minimize the disturbed area to protect natural features and soil. Control stormwater flowing onto and through the project. Phase construction activity and stabilize soils promptly. Prevent erosion by implementing soil stabilization practices such as mulching, surface roughening, permanent or temporary seeding. Perform a walk-through of the site to assess stabilization practices.

Concrete Trucks /Pumpers / Finishers

BMPs such as tarps and gravel bags should be implemented to prevent materials and residue from entering into the storm drain system.

Dumpsters

Always cover dumpsters. Areas around dumpsters should be cleaned daily. Perimeter controls around dumpster area should be provided if pollutants are leaking or discharging from the dumpster. The dumpster must be fully contained on the construction site and not in the right-of-way.

Washout Area

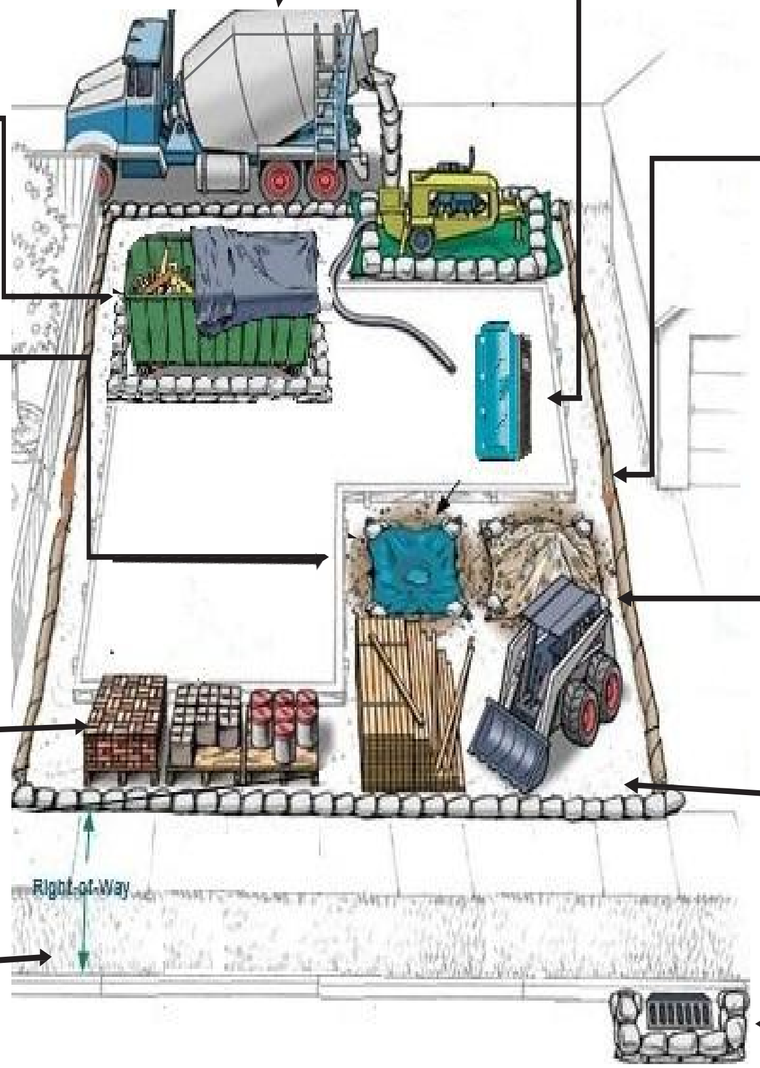
The disposal of "wet" construction materials should be handled in the washout area. This includes paint, stucco, and concrete. Do not wash out paint brushes in the street or dump any residue in the storm drain. Paint brushes and spray guns must be washed out into a hazardous materials drum, or back into the original container and disposed of properly. Washouts should never be in direct contact with the existing ground. Use a berm with an impervious liner to contain wet materials and prevent runoff to nearby areas. The washout area must be checked and maintained daily to ensure compliance. All dried material must be disposed of at a landfill.

Building Materials /Staging Area

Construction material must be stored on site at all times. Building material should always be covered when not in use to prevent dispersal or runoff caused by wind or rain. Flooding must also be prevented by monitoring your site before, during, and after rain events to ensure that BMPs are functioning properly and that there are not any safety issues.

Encroachment Permits

The right-of-way varies from the face of the curb to the private property line. Any construction work within the right-of-way requires an encroachment permit.



Portable Toilets

Portable toilets must be placed on a flat level surface away from any flow line. Portable toilets must have a secondary containment tray. Portable toilets must also be placed behind the curb. Avoid cleaning solutions from coming in contact with the soil.

Perimeter Controls

Perimeter controls are different and separate from erosion controls. Gravel bags, silt fences, and straw wattles are acceptable perimeter controls, and must be used to surround the entire site. Avoid running over perimeter controls with vehicles or heavy equipment to prevent damage to the BMPs. Keep extra absorbent materials and/or wet dry vacuum on site to quickly pick up unintended spills.

Dirt and Grading

Dust control measures shall be implemented during grading operations and throughout all aspects of site development. Mounds of dirt or gravel should be stored on site and sprayed daily with water to prevent excessive dust. The materials should be covered when not in use. For areas that are active and exposed, a wet weather active plan, including additional BMPs, should be in place to protect the site during a rain event. Sites must have a designated entrance/exit with adequate track out controls to prevent the transport of dirt/gravel from the site.

Earthmoving Equipment

Vehicles and earthmoving equipment should be cleaned, fueled and maintained off-site or in a designated contained area. Mud tracks and dirt trails left by equipment leading to and from the site must be cleaned up immediately.

Storm Drains

Storm drains must be protected at all times with perimeter controls, use ¾ inch gravel bags. Sand bags should not be used for inlet protection because they do not permit flow-through. Replace ruptured or damaged gravel bags and remove debris from the right-of-way immediately.

Revised December 2014

We ♥ our Watershed!

A clean and healthy watershed is important to all of us.

Trash, debris, chemicals and other contaminants from business activities often make their way into the Riverside County storm drain system. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife.

Did you know?

There is a difference between storm drains and sewers.

Storm drains capture rainwater and flow directly to our rivers, lakes and streams – untreated.

Sewers capture and collect water from sinks, toilets and floor drains, and then it is processed and treated before it is released into the environment.

For more information about how you can protect our watershed, please visit:
www.rcwatershed.org

Questions?

If you have questions about Best Management Practices, or if you have questions about illicit dumping and stormwater pollution visit the Pollution Prevention website: rcwatershed.org.

For more information on requirements for all retail food facilities go to Riverside County Environmental Health's website: rivcoeh.org

RIVERSIDE COUNTY
WATERSHED PROTECTION

Riverside County Watershed Protection Program is managed by Riverside County Flood Control & Water Conservation District in partnership with 27 Cities, the County of Riverside and the Coachella Valley Water District.

OUR MISSION

"To protect, preserve and enhance the quality of Riverside County watersheds by fostering a community-wide commitment to clean water."

Watershed Protection

Food Service Industry Best Practices

Restaurants
Mobile Food Trucks
Grocery Stores
Bakeries
Delicatessens

Best Kitchen Practices

Recycle Oil & Grease

- Never put oil or grease down the drain. Contain grease and oil by using covered grease storage containers or installing a grease interceptor.
- Never overfill your grease storage container or transport it without a cover.
- Grease control devices must be emptied and cleaned by permitted companies and according to manufacturer's specifications.
- Keep maintenance records on site.
- For a list of oil/grease recycling companies, contact CalRecycle www.calrecycle.ca.gov or contact your local sanitation district.

Managing Spills

- Clean food spills in loading and trash areas by using absorbent materials and sweeping then mopping.
- Discharge mop water into the sewer through a grease interceptor.
- Have spill containment and cleanup kits available.
- To report serious toxic spills, call 911.

Handling Toxic Chemicals

- Dispose of all unwanted toxics materials like cleaners, solvents and detergents through a hazardous waste hauler. These items are not trash!
- Use non-toxic cleaning products whenever possible.
- For information on hazardous waste transporters, call (888) 722-4234.

Dumpster Areas

- Keep dumpster lids closed and the areas around them clean.
- Do not fill with liquid waste or hose them out.
- Call your trash hauler to replace any dumpsters that are damaged or leaking.

Cleaning & Maintenance

- Clean equipment, floor mats, filters and garbage cans in a mop sink, wash rack or floor drain connected to a sanitary sewer.
- Sweep outside areas and put the debris in trash containers DO NOT hose down or sweep into the parking lot or street.
- Outside eating areas and sidewalks may not be hosed down or pressure washed UNLESS the following standards are met:
  - ✓ Use dry cleanup methods prior to any pressure washing – absorbing with kitty litter, sweeping, vacuuming, scraping off dried debris.
  - ✓ Wash waters must be captured for proper disposal: collected waters should be discharged to a sanitary drain.
  - ✓ DO NOT use any chemicals or detergents.
  - ✓ DO NOT wash or pour water in a parking lot, alley, sidewalk or street.

Mobile Food Trucks

- The potential for generating stormwater pollution as part of a mobile food business requires special attention. Cleaning activities are required to be conducted at an approved fixed location with a connection to a sanitary sewer. For more information contact Riverside County Environmental Health at (888) 722-4234.
- Do not discharge wash water into storm drains.
- Clean on a properly equipped wash pad and drain wastewater to a sanitary sewer system.

Food Waste Disposal

- Scrape food waste off of plates, pots and food prep areas and dispose of in the trash.
- Food scraps often contain grease, which can clog sewer pipes and result in costly sewer backups and overflows.
- Never put food waste down the drain.

RECYCLE
USED OIL