Technical Appendix E2

Water Quality Management Plan

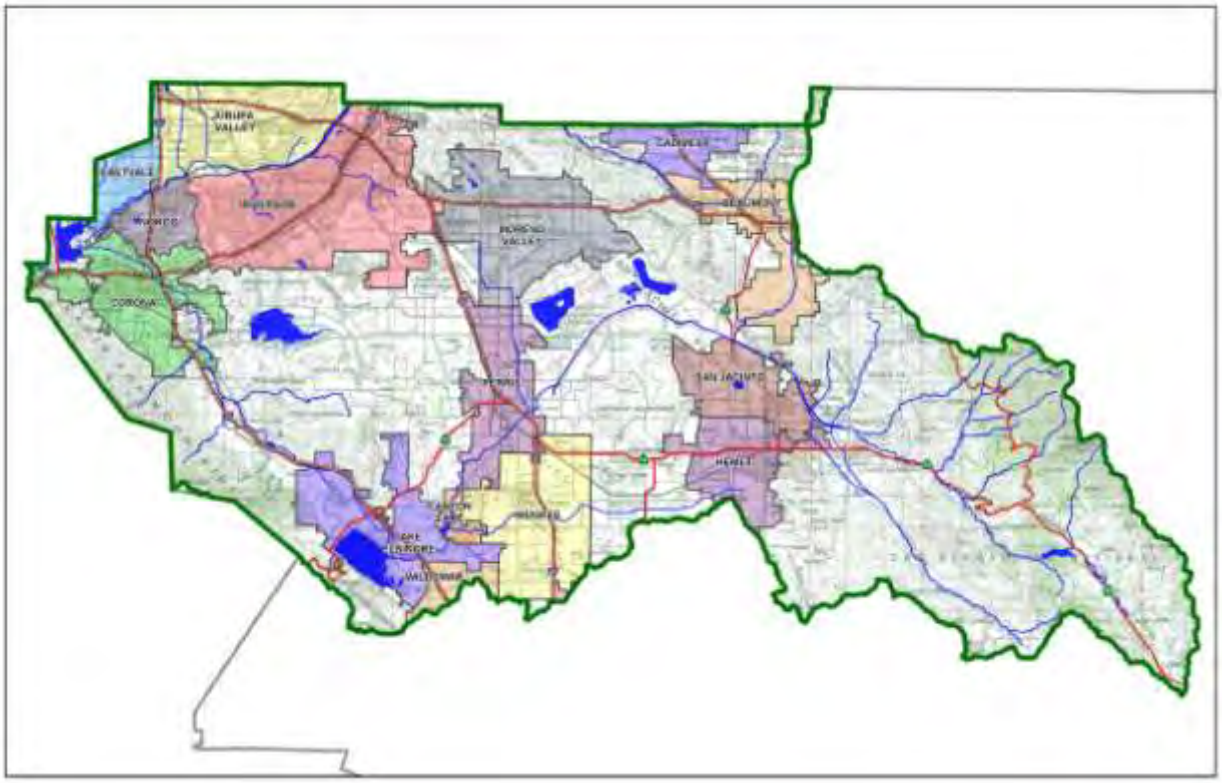
Project Specific Water Quality Management Plan

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

Project Title: Modular Logistics Center

Development No: PP _____

Design Review/Case No: P13-_____



Contact Information:

Prepared for: Kearny Modular Way, LLC
1900 Avenue of the Stars
Suite 320
Los Angeles, CA 90067
(310) 203-1840

Prepared by: Albert A. Webb Associates
Entcho Anguelov, P.E.
3788 McCray St.
Riverside, CA 92506
(951) 686-1070

☒ **Preliminary**
☐ **Final**

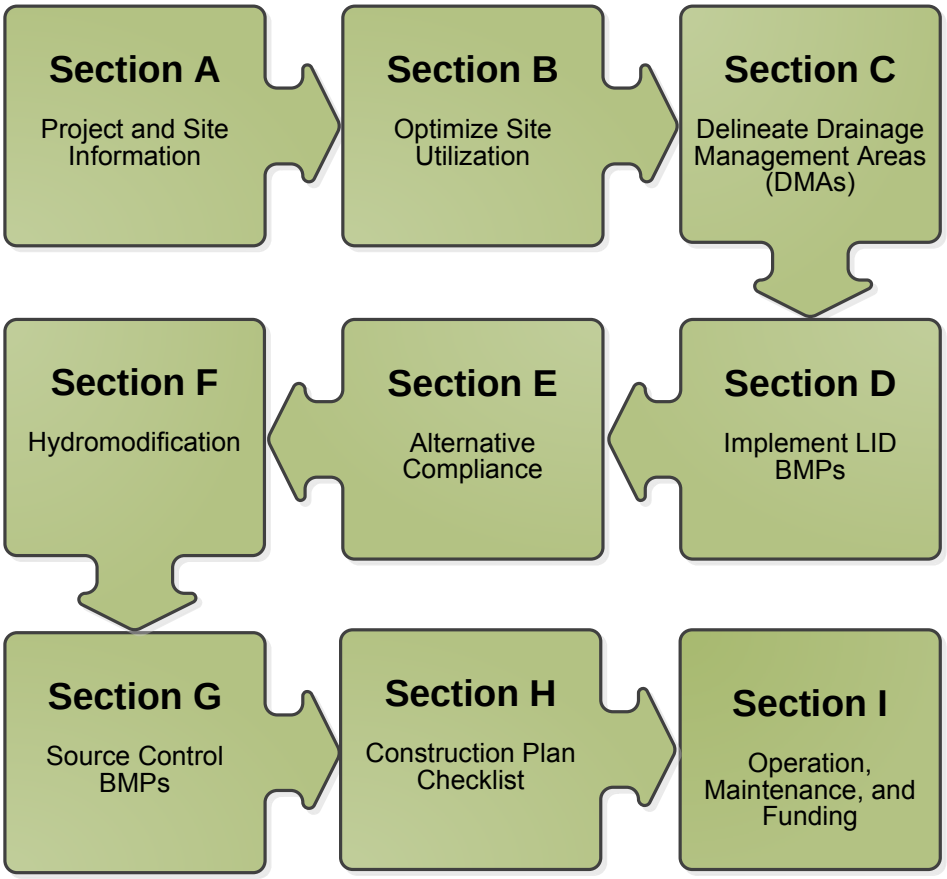
Original Date Prepared: October 30, 2013

Revision Date(s)

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

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 Preliminary Water Quality Management Plan (PWQMP) has been prepared for:

Kearny Modular Way, LLC by Albert A. Webb Associates for the project known as Modular Logistics Center, located on 50.84 (gross) acres at 17300 Perris Blvd, in the City of Moreno Valley, Riverside County, California.

This WQMP is intended to comply with the requirements of **The City of Moreno Valley** for **Municipal Code Chapter 8.10** 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 Moreno Valley** Water Quality Ordinance (Municipal Code **Chapter 8.10**).

"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
Entcho Anguelov, PE	Senior Civil Engineer
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

Table of Contents

Section A: Project and Site Information 6
A.1 Maps and Site Plans 6
A.2 Identify Receiving Waters 6
A.3 Additional Permits/Approvals required for the Project: 8
Section B: Optimize Site Utilization (LID Principles) 9
Section C: Delineate Drainage Management Areas (DMAs) 11
Section D: Implement LID BMPs 13
D.1 Infiltration Applicability 13
D.2 Harvest and Use Assessment 15
D.3 Bioretention and Biotreatment Assessment 17
D.4 Feasibility Assessment Summaries 18
D.5 LID BMP Sizing 19
Section E: Alternative Compliance (LID Waiver Program) 20
E.1 Identify Pollutants of Concern 21
E.2 Stormwater Credits 22
E.3 Sizing Criteria 22
E.4 Treatment Control BMP Selection 23
Section F: Hydromodification 24
F.1 Hydrologic Conditions of Concern (HCOC) Analysis 24
F.2 HCOC Mitigation 25
Section G: Source Control BMPs 26
Section H: Construction Plan Checklist 28
Section I: Operation, Maintenance and Funding 29

List of Tables

Table A.1 Identification of Receiving Waters 7
Table A.2 Other Applicable Permits 8
Table C.1 DMA Classifications 11
Table C.2 Type 'A', Self-Treating Areas 11
Table C.3 Type 'B', Self-Retaining Areas 11
Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas 12
Table C.5 Type 'D', Areas Draining to BMPs 12
Table D.1 Infiltration Feasibility 14
Table D.2 LID Prioritization Summary Matrix 18
Table D.3 DCV Calculations for LID BMPs 19
Table E.1 Potential Pollutants by Land Use Type 21
Table E.2 Water Quality Credits 22
Table E.3 Treatment Control BMP Sizing 22
Table E.4 Treatment Control BMP Selection 23
Table F.1 Hydrologic Conditions of Concern Summary 24
Table G.1 Permanent and Operational Source Control Measures 26
Table H.1 Construction Plan Cross-reference 28

List of Appendices

Appendix 1: Maps and Site Plans 30
Appendix 2: Construction Plans 31
Appendix 3: Soils Information 32
Appendix 4: Historical Site Conditions 33
Appendix 5: LID Infeasibility 34
Appendix 6: BMP Design Details 35
Appendix 7: Hydromodification 36
Appendix 8: Source Control 37
Appendix 9: O&M 38
Appendix 10: Educational Materials ..... - 6 -

Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	**Warehouse Industrial**
Planning Area:	**Industrial SP#208, Business park/Industrial**
Community Name:	**Not in a named community**
Development Name:	**Not part of a named development**
PROJECT LOCATION	
Latitude & Longitude (DMS): **33°52'14"N 117°13'18"W**	
Project Watershed and Sub-Watershed: **Santa Ana Watershed, San Jacinto Sub-watershed**	
APN(s): **312-250-030, -031, -032, -0.36, -037, -038**	
Map Book and Page No.: **2008 Thomas Brothers Guide, Page 747, Grids G5, H5**	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	**Warehouse/Industrial**
Proposed or Potential SIC Code(s)	**4225**
Area of Impervious Project Footprint (SF)	**2,020,410**
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	**2,020,410**
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)	**879,350**
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	**N/A**
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached? ***Infiltration testing report included.***	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	**HSG TYPE 'C'**
What is the Water Quality Design Storm Depth for the project?	**0.65"**

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
Proximate Receiving Waters			
San Jacinto River Reach 3, HU# 802.11	NONE	AGR, GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE.
Canyon Lake, HU # 802.11, 802.12	Nutrients, Pathogens	MUN, AGR, GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE.
San Jacinto River Reach 1, HU# 802.31, 802.32	NONE	MUN, AGR, GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE.
Lake Elsinore HU# 802.31	Nutrients, Organic Enrichment/Low Dissolved Oxygen, PCBs, Sediment Toxicity, Unknown Toxicity	REC1, REC2, WARM, WILD	Not a water body classified as RARE.
Downstream Receiving Waters			
Temescal Creek (Reach 6) HU#801.35	Indicator Bacteria	GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE.
Temescal Creek (Reach 5) HU#801.35	NONE	AGR, GWR, REC1, REC2, WARM, WILD, **RARE**	23 miles
Temescal Creek (Reach 4) HU#801.34	NONE	AGR, GWR, REC1, REC2, WARM, WILD, **RARE**	26 miles
Temescal Creek (Reach 3) HU#801.34	NONE	AGR, IND, GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE
Temescal Creek (Reach 2) HU#801.32	NONE	AGR, IND, GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE.
Temescal Creek (Reach 1) HU#801.25	pH	REC1, REC2, WARM, WILD	Not a water body classified as RARE.
Santa Ana River, Reach 3, HU#801.21, 801.27, 801.25	Copper, Lead, Pathogens	AGR, GWR, REC1, REC2, WARM, WILD, **RARE**	48 miles
Prado Basin Management Zone HU#801.25	NONE	REC1, REC2, WARM , WILD, **RARE**	49 miles
Santa Ana River, Reach 2, HU#801.11, 801.12	Indicator Bacteria	AGR, GWR, REC1, REC2, WARM, WILD, **RARE**	52 miles
Santa Ana River, Reach 1, HU#801.11	NONE	REC1, REC2, WARM, WILD	Not a water body classified as RARE.
Tidal Prism of Santa Ana River (to within 1000' of Victoria Street) and Newport Slough HU#801.11	Enterococcus, Fecal Coliform, Total Coliform	REC1, REC2, COMM, WILD, **RARE**, MAR	75 miles
Pacific Ocean Nearshore Zone HU#801.11	NONE	IND, NAV, REC1, REC2, COMM, WILD, **RARE**, SPWN, MAR, SHEL	76 miles
Pacific Ocean, Offshore Zone HU #801.11	NONE	IND, NAV, REC1, REC2, COMM, WILD, **RARE**, SPWN, MAR	77 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)* **City of Moreno Valley Grading Permit** **City of Moreno Valley Building Permit**	☒ 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.

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?

Yes. The existing drainage pattern is southeast, which has been perpetuated in the proposed site design.

Did you identify and protect existing vegetation? If so, how? If not, why?

Existing vegetation is identified as low quality sage/chaparral scrub brush, and is present only intermittently between regular site clearing (typically done by disking or mowing, for fire suppression reasons). Because of the low quality and intermittent nature of the existing vegetation, it is infeasible to protect it. Please see Aerial Exhibit included in Appendix 1

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

As shown in Appendix 1 (Site Maps – Soil Map), the entire site is underlain with hydrologic soil group 'C' as determined by the NRCS. This type of soil has poor infiltration capacity, as has been proven by numerous percolation tests performed on nearby sites for other projects. As such, the existing (poor) infiltration capacity has not been adversely impacted by the proposed development.

Did you identify and minimize impervious area? If so, how? If not, why?

No. The project type for the proposed construction severely limits minimization of impervious area (heavy truck traffic eliminates the use of permeable pavements, which would otherwise be eliminated by the poor infiltration capacity of the underlying substratum).

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes, the entire site has been proposed to drain to a water quality basin, thereby eliminating any directly connected impervious area to downstream stormwater management facilities.

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
DMA 1	*Concrete or asphalt*	*911032*	*D*
DMA 2	*Roofs*	*1109378*	*D*
DMA 3	*Landscaping*	*187000*	*A*

[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)**
*DMA 3**	*100,000*	*Self Treating Depressed Landscape Areas*	Irrigated

**Note: recommended for use during final design as source control LID BMP.*

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]
Not used				*Not used*		

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

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	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]
Not used.							

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

DMA Name or ID	BMP Name or ID
DMA 1	*Extended detention WQMP Basin*
DMA 2	*Extended detention WQMP Basin*
DMA 3	*Extended detention WQMP Basin*

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.

Note: The poorly draining soil is likely to pose a problem with prolonged ponding were any Type A, B, or C areas to be proposed.

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

Note: 1/28/13 CNRP Consulted

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.

Please see the infiltration testing report included in Appendix 3. The tested infiltration rates are 1.13 and 0.97 in/hr for the two tests conducted within the basin bottom vicinity. An average infiltration rate of 1.0 in/hr is recommended for use by the infiltration test report. As such, infiltration is infeasible on this site.

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:		
…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:	1,2,3	
…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:		

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*:*

☐ 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:

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

Total Area of Irrigated Landscape: ***4.3 ac***

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

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: ***46.4*** **ac**

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: ***1.05***

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: ***48.7 ac***

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)
48.7 ac	***4.3 ac***

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

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: ***300***

Project Type: ***Warehouse/Light Industrial***

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: ***46.4 ac.***

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

Enter your TUTIA factor: ***185***

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: ***8,584***

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)
8,584	***300***

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.

N/A

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)**
N/A	***N/A***

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.

An Extended Detention Basin (Biotreatment BMP) is proposed for this site. The necessary additional basin volume and depth for retention of the 100-year storm runoff precludes the use of Bioretention BMP which does not allow for more than 6" of ponding.

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	
1	☐	☐	☐	☒	☐
2	☐	☐	☐	☒	☐
3	☐	☐	☐	☒	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

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.

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	*Bioretention Basin*		
	[A]		[B]	[C]	[A] x [C]			
1	*911,032*	*Concrete/ Asphalt*	*1*	*0.89*	*812641*	*Design Storm Depth (in)*	*Design Capture Volume,* V_{BMP} *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
2	*1,109,378*	*Roofs*	*1*	*0.892*	*989,565*			
3	*187,000*	*Landscape*	*0.1*	*0.11*	*20,656*			
						0.65	103,296	103,300
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]

[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

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.

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]
None	**N/A**
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)*
	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]

[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	**N/A**	**N/A**	**N/A**
Volume (Cubic Feet)	**N/A**	**N/A**	**N/A**

[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:

Canyon Lake, please see the included in Appendix 7 HCOC Applicability Map.

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:

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.

The proposed Water Quality / Detention Basin is designed to retain the 100-year runoff volume as well. A pump system is proposed to dewater the basin. The depth of the water quality treatment Design Capture Volume (DCV) is 2.6 feet. Three (3) orifices with 2.25 inches of diameter each are proposed at the basin bottom elevation to facilitate the requirement for empting the first half of the DCV within 24 hours and the total DCV within 72 hours. The rest of the basin volume up to 7.6 feet of depth is used to retain the 100-year runoff volume and it will be discharged with a constant pump rate of 4 cfs. A rectangular 4 feet long by 6" high orifice is located at 6.2 feet of depth to serve as additional outlet during the 100-year 24-hour event. The outlet rates from the basin are designed to complement the anticipated flow rates in the storm drain on Kitching Avenue during different 100-year storm durations in such a way that the combined flows do not exceed the maximum design storm drain capacity.

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. **Checklist added to Appendix 8.**

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
Landscape/ Outdoor Pesticide Use	*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*	*Maintain landscaping using minimum or no pesticides. See applicable operational BMPs in "What you should know for…..Landscape and Gardening" in Appendix 10. Provide IPM information to new owners, lessees and operators.*

	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.	
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.*
Trash Storage Areas.	*Trash container storage areas will be paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements around the area, and screened or walled to prevent off-site transport of trash. Trash dumpsters (containers) shall be leak proof and have attached covers or lids. Trash enclosures shall be roofed per City standards (see WQMP exhibit for further details and locations). Trash compactors shall be roofed and set on a concrete pad per city standards. The pad shall be a minimum of one foot larger all around than the trash compactor and sloped to drain to a sanitary sewer line.*	*Inspect monthly. Have trash hauled away when containers are full and on a regular basis. Maintain trash receptacles and enclosures in good working order.*
Loading Docks.	*Loading docks will not be covered. Loading docks will be kept in a clean and orderly condition, through a regular program of sweeping and litter control, and immediate clean up of any spills or broken containers. The property owner will ensure that loading docks will be swept as needed. Cleanup procedures will not include the use of wash-down water. The property owner will be responsible for implementation of loading dock housekeeping procedures*	*Inspect for accumulated trash and debris. Implement good housekeeping procedures on a regular basis. Sweep areas clean instead of using wash water.*

Section H: Construction Plan Checklist

This Section will be completed and addressed at the time of the final WQMP submittal.

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)
Extended Detention WQMP BASIN	N/A during Preliminary WQMP. Typical details and sections are provided in the BMP Exhibit.	Preliminary WQMP Post-Construction BMP Plan
Plot Plan	Included in Appendix 2 for reference	Plot Plan

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

This Section will be completed and addressed at the time of the final WQMP submittal.

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: ***Kearny Modular Way, LLC (owner) or its assignee will operate and maintain this WQMP.***

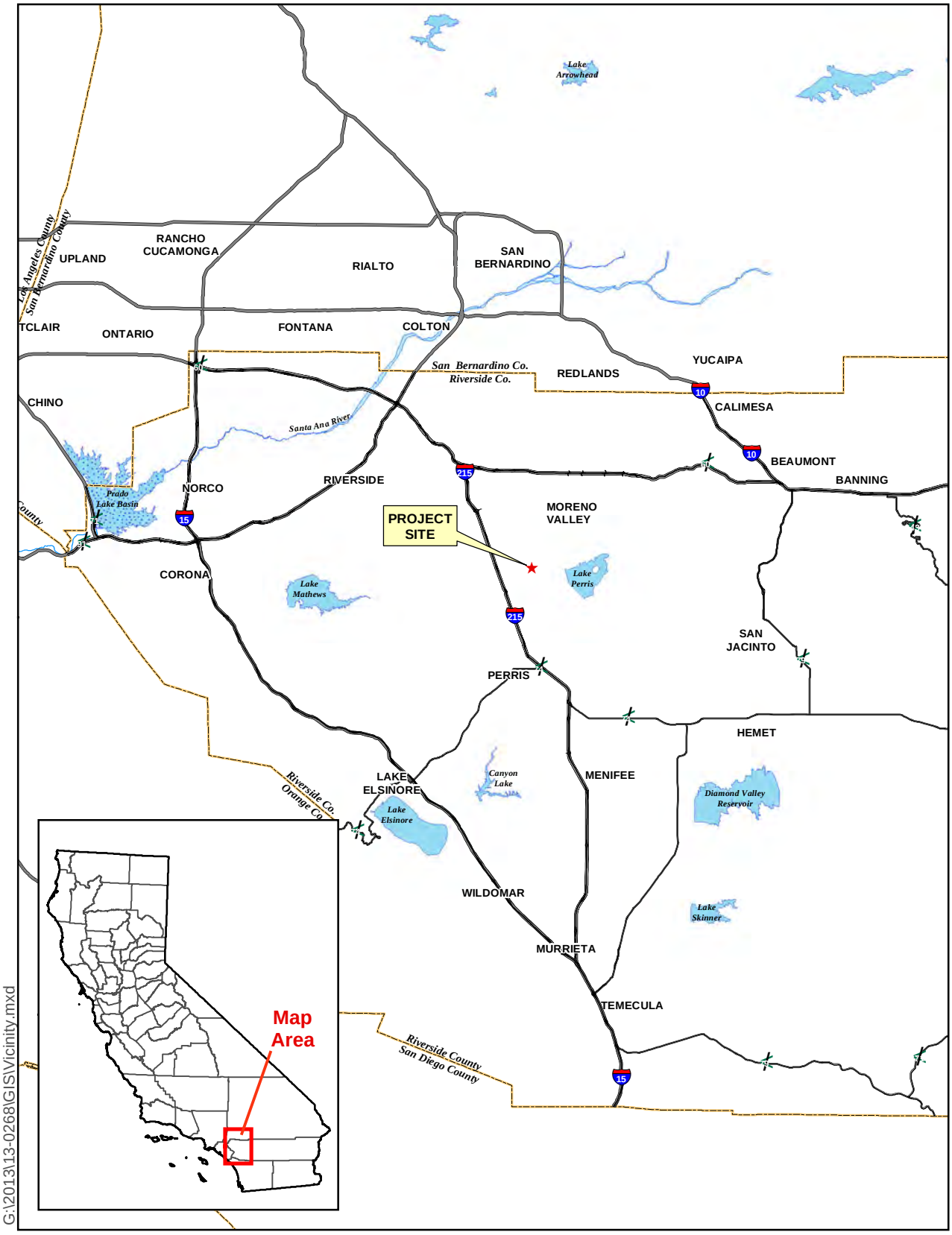
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☐ 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.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map



Vicinity Map

Modular Logistics Center

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0 2 4 6 Miles

Albert A. WEBB Associates

Map created September 9, 2011. G:\2013\13-0268\GIS\Aerial.mxd

Sources: County of Riverside GIS, 2011;
Eagle Aerial, April 2010.

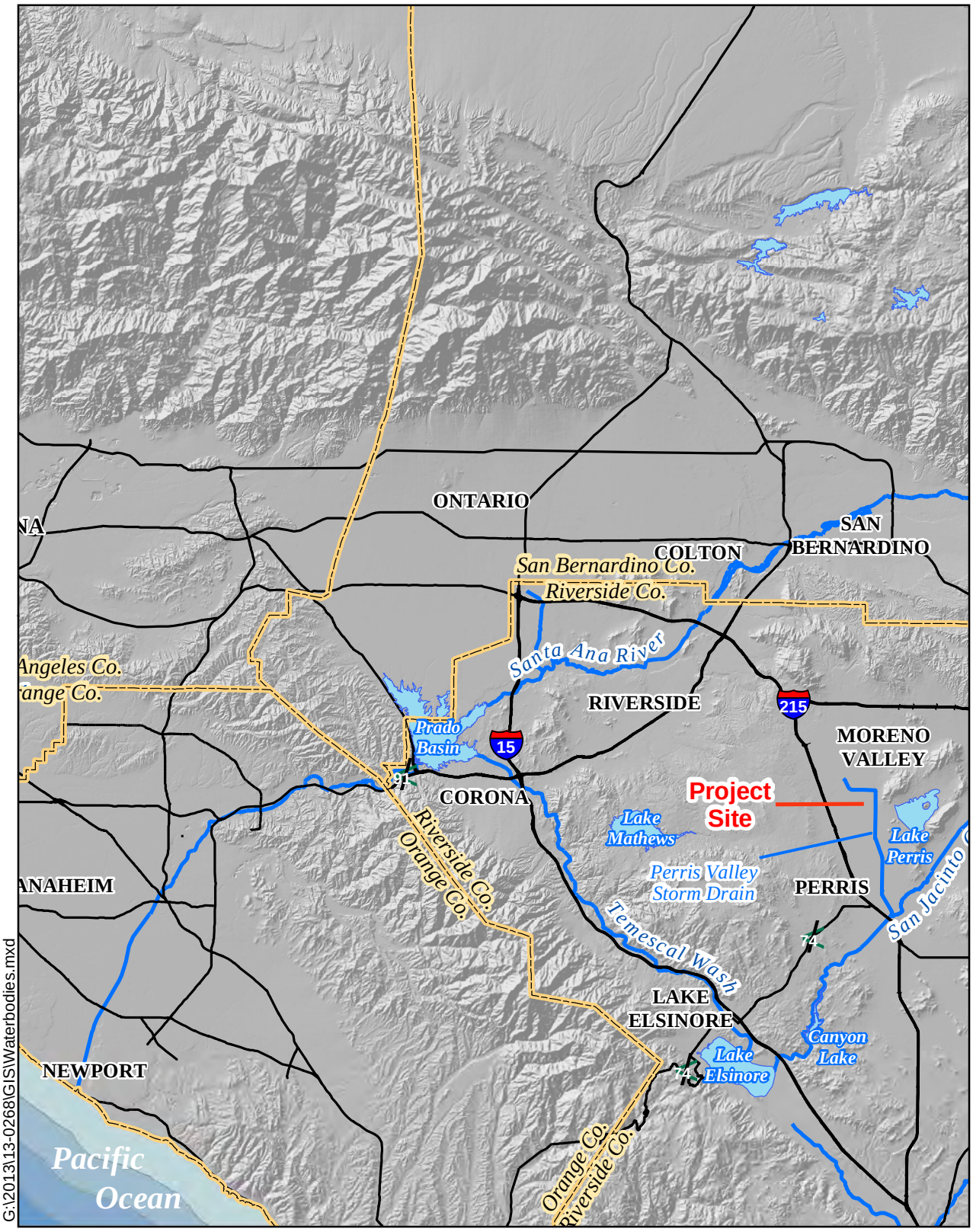
N
W E
S

0 500 1,000 1,500 2,000 Feet

Aerial Image

Modular Logistics Center

Albert A. WEBB Associates



G:\2013\13-0268\GIS\Waterbodies.mxd

Sources: USGS 30 Meter DEM;
USGS Digital Line Graph

Receiving Waterbodies

Modular Logistics Center

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W E
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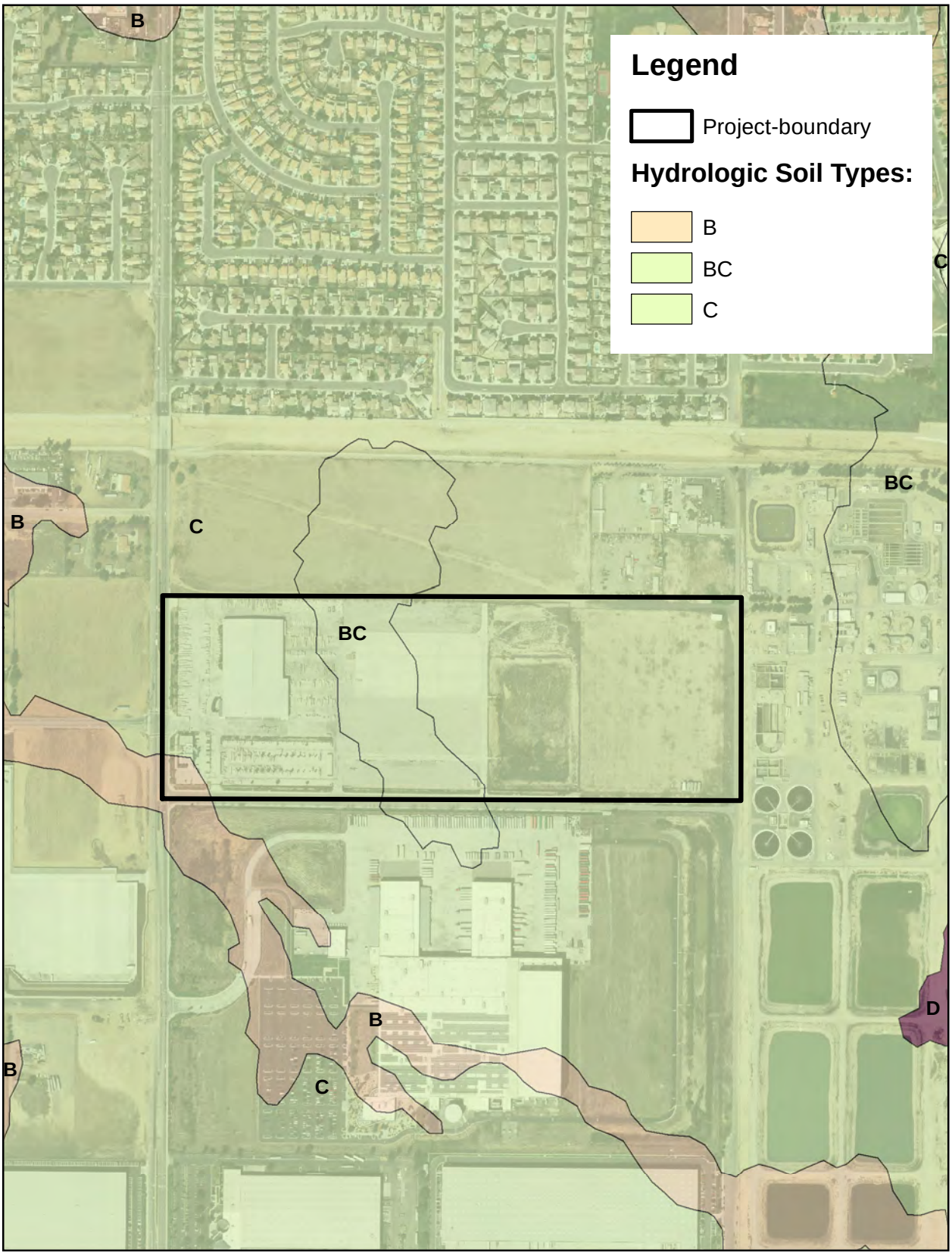
0 2 4 6 8 10
Miles

Albert A. WEBB Associates



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Sources: County of Riverside, 2011;
Eagle Aerial, April 2012.

Soils Map

Modular Logistics Center

0 750 1,500 2,250 Feet

N W E S

Albert A. WEBB Associates

MODULAR LOGISTICS CENTER
PWQMP POST-CONSTRUCTION BMP PLAN

N
W WEBB E
S

1" = 80'
40 0 80

TOPOGRAPHY:
INLAND AERIAL SURVEY
DATED 8-20-12

A.P.N.
312-250-030, 312-250-031, 312-250-032,
312-250-036, 312-250-037, 312-250-038,

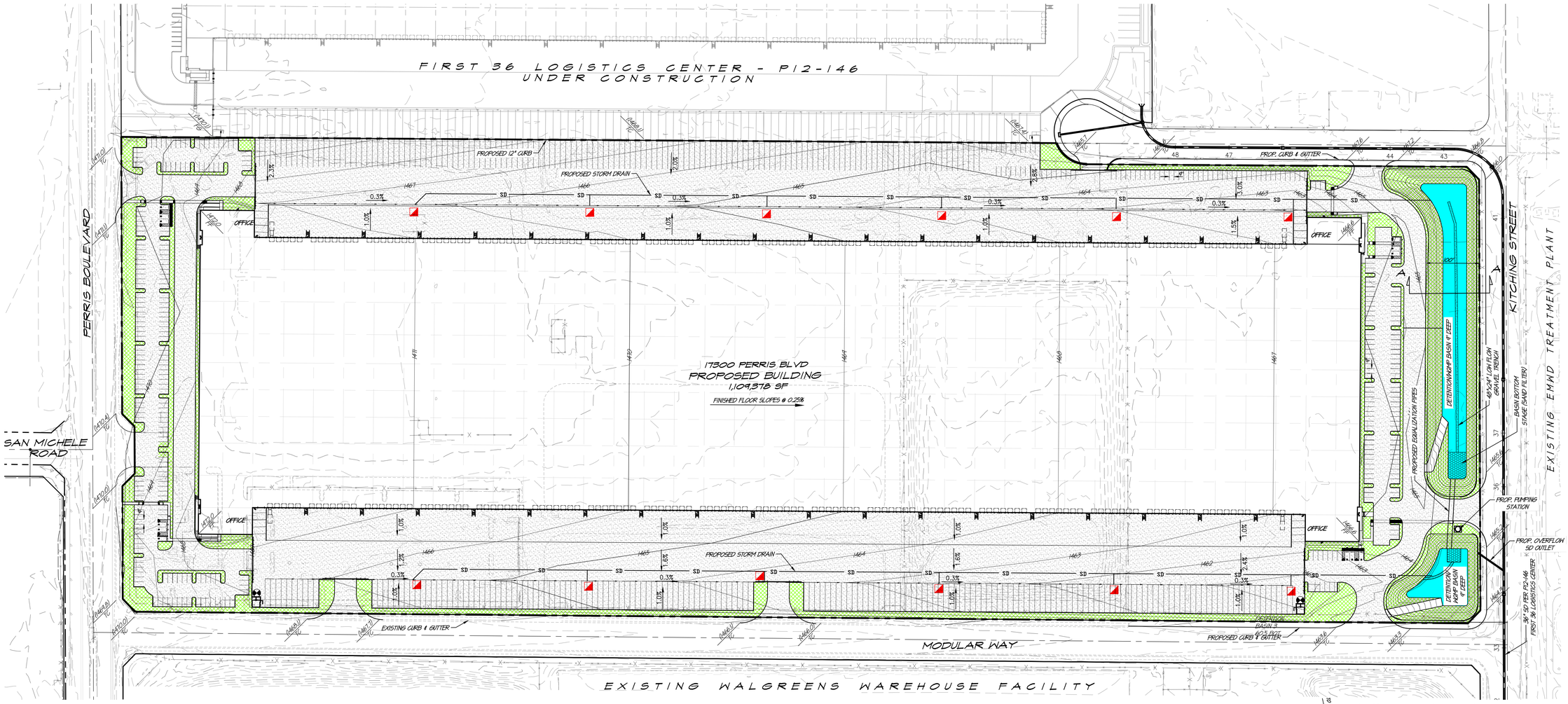
LAND USE / ZONING:

EXISTING LAND USE:	WAREHOUSE
PROPOSED LAND USE	INDUSTRIAL
EXISTING ZONING:	INDUSTRIAL SP
PROPOSED ZONING	INDUSTRIAL SP

ACERAGE

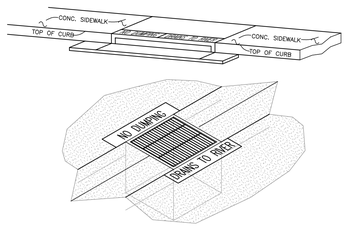
GROSS SITE AREA:	50.84 AC.
NET SITE AREA:	50.68 AC.

LANDSCAPE AREA
8.5% PROPOSED
187,000 S.F. PROPOSED COVERAGE



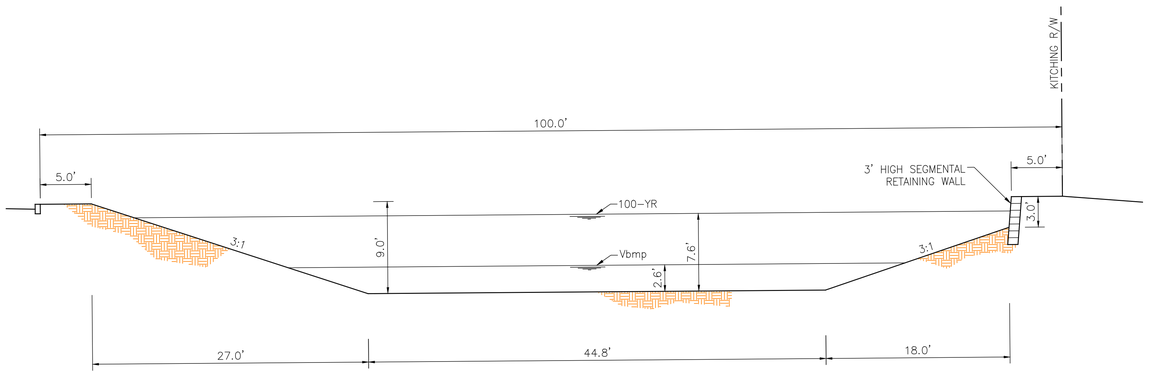
LEGEND

- -WATER QUALITY / DETENTION BASIN PER SECTION ON SHEET 2
- -AREAS OF LANDSCAPE
- -TRASH ENCLOSURES, SEE DETAILS ON SHEET NO. 2
- -DRAINAGE BOUNDARY
- -STORM DRAIN STENCILING PER DETAIL HEREON

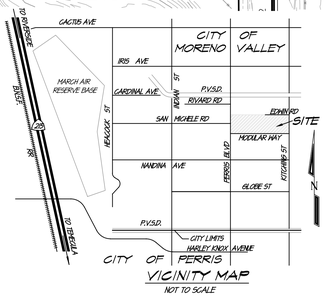


1. STENCILS TO HAVE 2" LETTERS AS FOLLOWS: "NO DUMPING DRAINS TO RIVER"
2. PLACE BOTH STENCILS CENTERED WITHIN THE CATCHBASIN OPENING AND WITHIN THE TOP OF THE CURB.
3. SPRAY BOTH STENCILS WITH WHITE PAINT.
4. REMOVE STENCILS WHEN PAINT IS DRY

CATCH BASIN STENCILING DETAIL
N.T.S.



WATER QUALITY / DETENTION BASIN SECTION A-A
SCALE 1"=6'



CITY OF MORENO VALLEY

MODULAR LOGISTICS CENTER

PWQMP POST-CONSTRUCTION BMP PLAN

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE, CA. 92506
PH. (951) 686-1070
FAX (951) 788-1256

SHEET 1 OF 2 SHEETS

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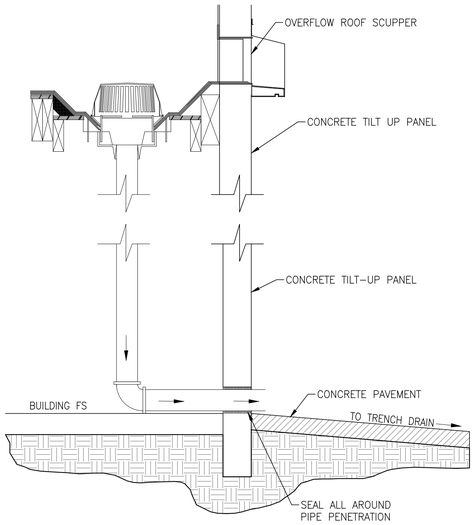
MODULAR LOGISTICS CENTER
PWQMP POST-CONSTRUCTION BMP PLAN

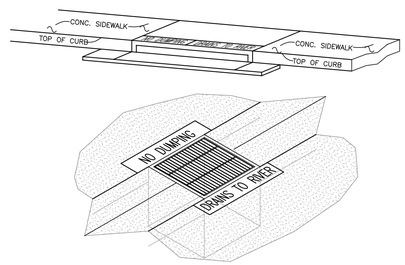


ROOF DRAIN DETAIL

N.T.S.

GENERAL NOTES

1. ALL PROPOSED STORM DRAIN CURB OPENING CATCH BASINS AND DROP INLETS SHALL BE STENCILED PER CITY OF MORENO VALLEY'S REQUIREMENTS AND DETAIL HEREON (SEE CASQA SD-13).
2. ALL ROOF RUN-OFF SHALL BE DISCHARGED DIRECTLY ONTO THE PROPOSED ON-SITE FINISH SURFACES PER DETAIL HEREON AND BE TREATED BY THE PROPOSED WATER QUALITY EXTENDED DETENTION BASIN BEFORE DISCHARGING INTO THE OFF-SITE MS4 STORM DRAIN FACILITY (SEE CASQA SD-11).
3. TRASH ENCLOSURES PER DETAILS HEREON AND CASQA SD-32 .



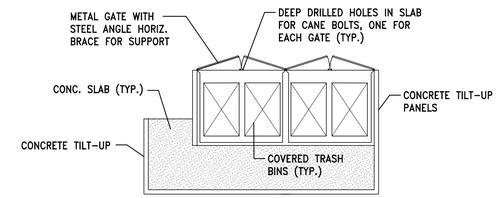
1. STENCILS TO HAVE 2" LETTERS AS FOLLOWS: "NO DUMPING DRAINS TO RIVER"
2. PLACE BOTH STENCILS CENTERED WITHIN THE CATCHBASIN OPENING AND WITHIN THE TOP OF THE CURB.
3. SPRAY BOTH STENCILS WITH WHITE PAINT.
4. REMOVE STENCILS WHEN PAINT IS DRY

CATCH BASIN STENCILING DETAIL

N.T.S.

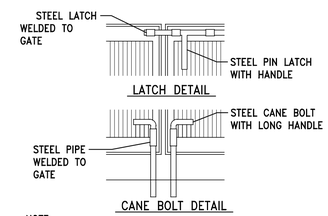
TRASH ENCLOSURE GATE ELEVATION

N.T.S.



TRASH ENCLOSURE PLAN DETAIL

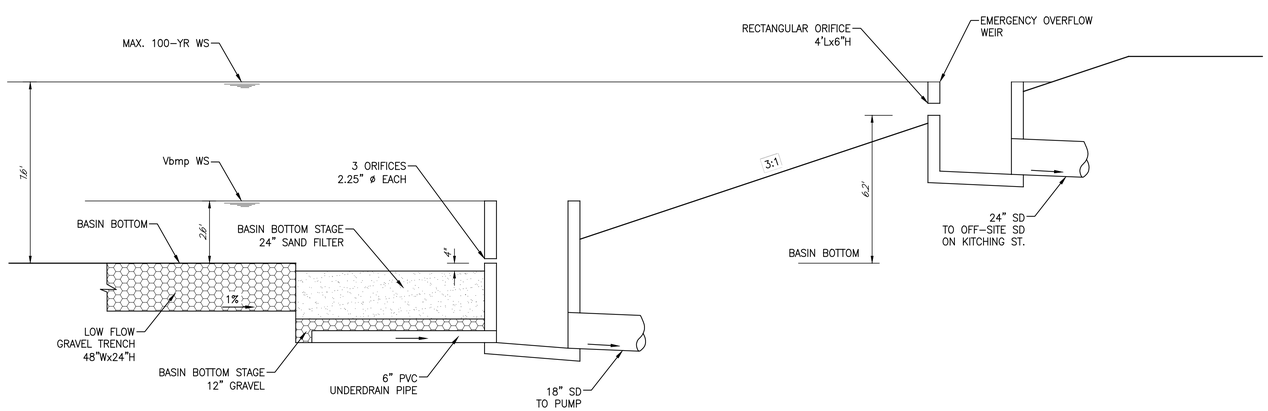
N.T.S.



NOTE:
LATCH AND CANE TO BE AT EXTERIOR SIDE OF GATES

TRASH ENCLOSURE GATE LATCHES DETAIL

N.T.S.



EXTENDED DETENTION BASIN OUTLET SCHEMATIC

N.T.S.

CITY OF MORENO VALLEY

MODULAR LOGISTICS CENTER

PWQMP POST-CONSTRUCTION BMP PLAN DETAILS

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070
FAX (951) 788-1256

SHEET 2 OF 2 SHEETS

G:\2013\13-0268\PWQMP\13-0268 WQMP 2.DWG

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Appendix 2: Construction Plans

Grading and Drainage Plans

MODULAR LOGISTICS CENTER
PLOT PLAN & CONCEPTUAL GRADING PLAN
P13-XXX

N W E S

1" = 80'
40 0 80

OWNER:
COMPANY: KEARNY MODULAR WAY LLC
CONTACT: JASON ROSIN
ADDRESS: C/O KEARNY REAL ESTATE CO.
1900 AVENUE OF THE STARS, SUITE 320
LOS ANGELES CA 90067
PHONE: (310) 203-1840

APPLICANT:
COMPANY: KEARNY REAL ESTATE COMPANY
CONTACT: JASON ROSIN
ADDRESS: 1900 AVENUE OF THE STARS, SUITE 320
LOS ANGELES CA 90067
PHONE: (310) 203-1840

ENGINEER:
COMPANY: ALBERT A. WEBB ASSOCIATES
CONTACT: ROBERT BERNDT
ADDRESS: 3788 MCGRAY ST
RIVERSIDE, CA 92506
PHONE: (951) 686-1070
FAX: (951) 788-1256

ARCHITECT
COMPANY: HPA ARCHITECTURE
CONTACT: HOON PARK
ADDRESS: 18831 BARDEEN, SUITE 1100
IRVINE, CA 92612
PHONE: (949) 863-1770
FAX: (949) 863-0851

TOPOGRAPHY:
INLAND AERIAL SURVEY
DATED 8-20-12

SETBACKS
MINIMUM SITE AREA: 5 AC
MINIMUM SITE WIDTH: 300'
MINIMUM SITE DEPTH 150'

MINIMUM SETBACKS
PERRIS BLVD 20'
MODULAR WAY 10'
EDWIN STREET 10'
KITCHING STREET 15'

A.P.N.
312-250-030, 312-250-031, 312-250-032,
312-250-036, 312-250-037, 312-250-038,

LAND USE / ZONING:
EXISTING LAND USE: WAREHOUSE
PROPOSED LAND USE INDUSTRIAL
EXISTING ZONING: INDUSTRIAL SP
PROPOSED ZONING INDUSTRIAL SP

ACREAGE
GROSS SITE AREA: 50.84 AC.
NET SITE AREA: 50.68 AC.

LANDSCAPE AREA
8.5% PROPOSED
187,000 S.F. PROPOSED COVERAGE

EARTHWORK ESTIMATE:
CUT: 108,400 CY
FILL: 88,200 CY
SHRINKAGE: 46,200 CY
NET: 26,000 CY IMPORT

UTILITY COMPANIES:
WATER: EASTERN MUNICIPAL WATER DISTRICT
PHONE: (951) 928-6107.
SEWER: EASTERN MUNICIPAL WATER DISTRICT
PHONE: (951) 928-6107
ELECTRIC: MORENO VALLEY UTILITIES
PHONE: (951) 413-3500
TELEPHONE: VERIZON
PHONE: (909) 659-1305
GAS: SOUTHERN CALIFORNIA GAS COMPANY
PHONE: (909) 335-3928

PROJECT DESCRIPTION:
THIS PROJECT PROPOSES A 1,104,318 SF WAREHOUSE BUILDING ON 50.7 ACRES, CONSISTING OF 1,084,318 SF WAREHOUSE, 20,000 OFFICE. THE PROJECT PROPOSES 256 LOADING DOCKS, SURFACE PARKING AREAS, DRIVE ISLE ROADWAY IMPROVEMENTS, UTILITY INFRASTRUCTURE, LANDSCAPING, WATER QUALITY/FILTRATION BASINS AND OTHER SITE IMPROVEMENTS INCLUDING DEMOLITION OF EXISTING WAREHOUSE FACILITY.

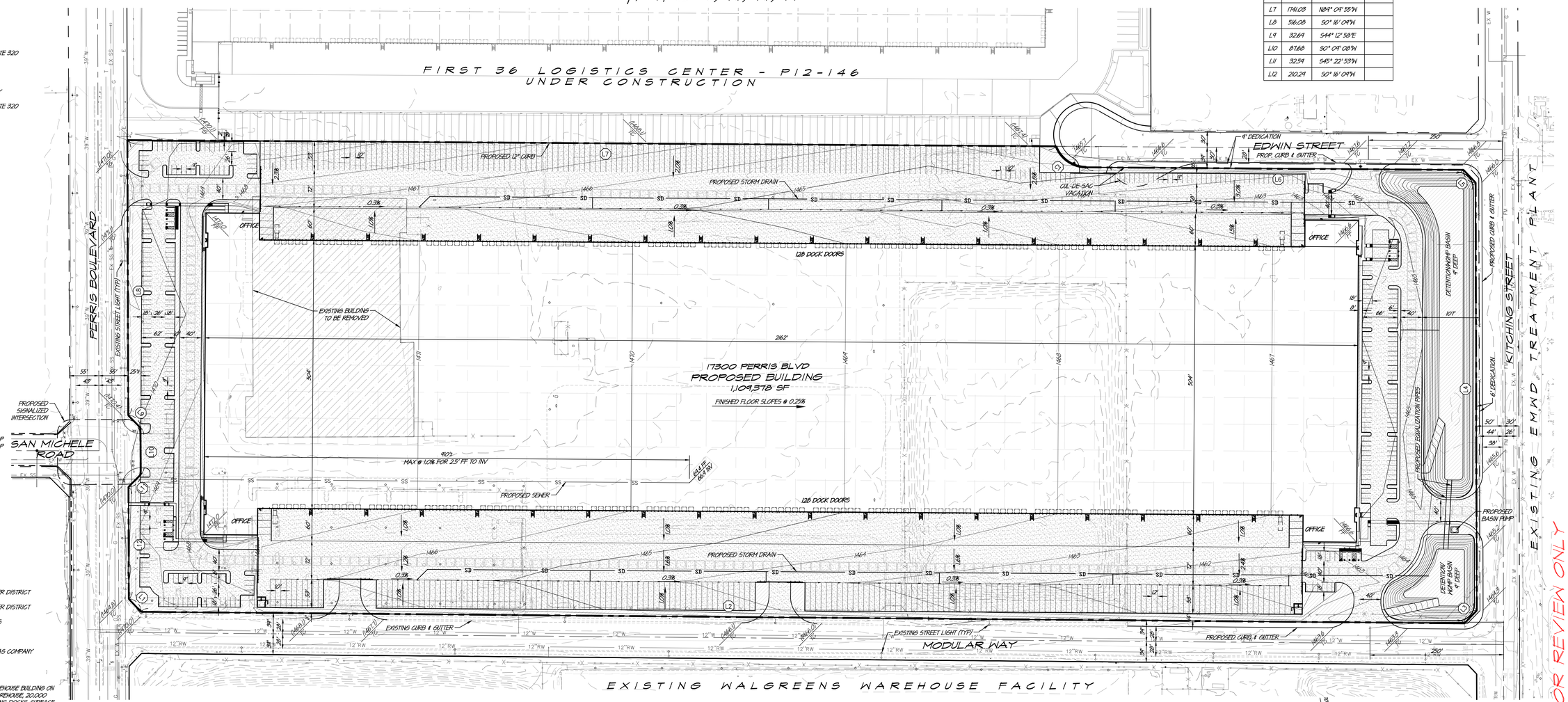
NOTES:
1. 2008 THOMAS BROS. MAP-PAGE 747, GRID H6
2. THIS AREA IS NOT SUBJECT TO LIQUEFACTION OR OTHER GEOLOGIC HAZARDS WITHIN A SPECIAL STUDIES ZONE.
3. FEMA COMMUNITY PANEL NO. 06065C1430G ZONE X.
4. CONTOUR INTERVAL, ONE FOOT.
5. THIS AREA IS WITHIN THE MORENO VALLEY INDUSTRIAL SPECIFIC PLAN #208.
6. THIS PROJECT IS WITHIN CITY OF MORENO VALLEY COMMUNITY SERVICES DISTRICT ZONE A & C.
7. DRIVEWAYS ARE PER CITY STANDARD PLAN NO. 1180.
8. ALL TRAILER PARKING STALLS ARE 12' X 53'
9. FUTURE PARCEL MERGER WILL BE CONDITIONED

LEGAL DESCRIPTION
PORTIONS OF PARCELS 1 THROUGH 4, INCLUSIVE OF PARCEL MAP NO. 4314, ON FILE IN BOOK 39 OF PARCEL MAP, 58 AT PAGE 27, RECORDS OF RIVERSIDE COUNTY, LYING WITHIN SECTION 32, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M.

FOR A MORE DETAILED DESCRIPTION, REFER TO TITLE REPORT

STREET ADDRESS
17250 AND 17300 PERRIS BLVD., MORENO VALLEY

LINE AND CURVE TABLE			
#	LENGTH	BEARING/DELTA	RADIUS
C1	73.31	68.86	61.00
L1	33.04	S43° 04' 27"E	
L2	2481.48	S84° 03' 04"E	
L3	33.43	N44° 24' 45"E	
L4	802.08	N0° 17' 04"E	
L5	33.08	N43° 12' 33"W	
L6	707.35	N84° 04' 55"W	
L7	1741.03	N84° 04' 55"W	
L8	516.08	S0° 16' 04"W	
L9	32.69	S44° 12' 58"E	
L10	87.68	S0° 04' 08"W	
L11	32.59	S45° 22' 53"W	
L12	210.29	S0° 16' 04"W	

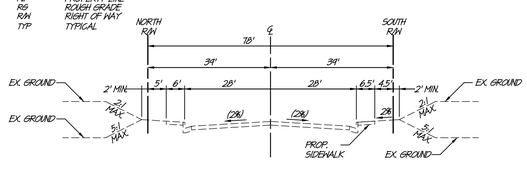


LEGEND

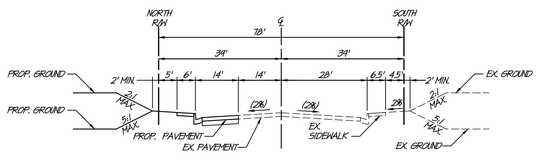
- PROPOSED CONCRETE PAVEMENT
- PROPOSED LANDSCAPE AREA
- EXISTING BUILDING TO BE REMOVED
- PROPOSED FIRE LANE
- PROPOSED SCREEN WALL
- PROPOSED CHAINLINK FENCE
- GRADEBREAK/RIDGELINE
- FLOWLINE
- (1475) EXISTING CONTOURS
- 1475 PROPOSED CONTOURS
- EX W EXISTING WATER LINE
- EX SS EXISTING SEWER LINE
- 50 EXISTING STORM DRAIN
- G EXISTING GAS LINE
- E EXISTING ELECTRICAL LINE

FL	FLOW LINE
GB	GRADE BREAK
GRND	GROUND
INV	INVERT
LS	LANDSCAPE AREA
LP	LOW POINT
MAX	MAXIMUM
PL	PROPERTY LINE
RG	ROUGH GRADE
R/W	RIGHT OF WAY
TYP	TYPICAL

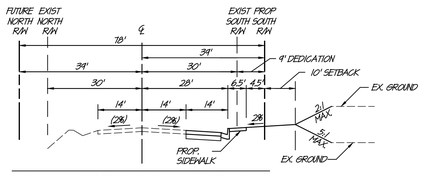
SITE TABULATION:	BLDG.
PROPOSED PARCEL NET AREA	2,207,140 SF (50.68 AC)
BUILDING AREA	
OFFICE	20,000 SF
WAREHOUSE	1,084,318 SF
TOTAL BUILDING AREA	1,104,318 SF
LOT COVERAGE	50.3%
LANDSCAPING PROVIDED	187,000 SF
LANDSCAPE COVERAGE	8.5%
OFFICE PARKING (REQD) 0 - 10,000 SF @ 1/250 SF	80 STALLS
WAREHOUSE PARKING (REQD) 0 - 20,000 SF @ 1/1,000 SF	20 STALLS
20,001 - 40,000 SF @ 1/2,000 SF	10 STALLS
OVER 40,001 SF @ 1/4,000 SF	268 STALLS
TOTAL REQUIRED PARKING	378 STALLS
TRAILER PARKING (REQD) 1/1 DOOR RATIO	256 STALLS
PARKING PROVIDED: STANDARD (9'X19')	362 STALLS
HANDICAP (9'X18')	12 STALLS
TRAILER PARKING (12'X53')	306 STALLS
TOTAL PARKING PROVIDED:	680 STALLS



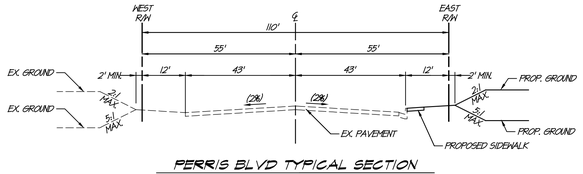
MODULAR WAY TYPICAL SECTION
INDUSTRIAL COLLECTOR STREET
STD. NO. 106, NOT TO SCALE
TI=10.0



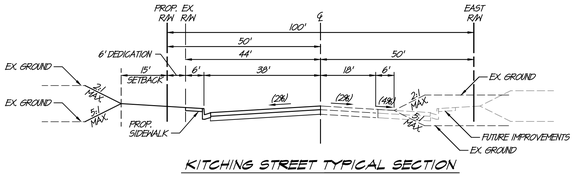
MODULAR WAY TYPICAL SECTION
INDUSTRIAL COLLECTOR STREET
STD. NO. 106, NOT TO SCALE
TI=10.0



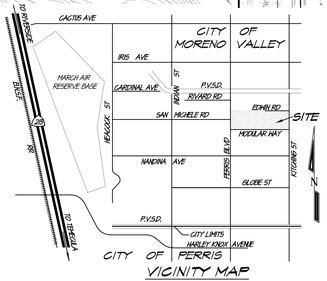
EDWIN STREET TYPICAL SECTION
INDUSTRIAL COLLECTOR STREET
STD. NO. 106, NOT TO SCALE
TI=10.0



PERRIS BLVD TYPICAL SECTION
ARTERIAL STREET
STD. NO. 104, NOT TO SCALE



KITCHING STREET TYPICAL SECTION
ARTERIAL STREET
STD. NO. 104, NOT TO SCALE



VICINITY MAP
NOT TO SCALE

REVISIONS	DATE	BY

CITY OF MORENO VALLEY

MODULAR LOGISTICS CENTER
PLOT PLAN & CONCEPTUAL GRADING PLAN
P13-XXX

SCALE: 1"=80'	ALBERT A. WEBB ASSOCIATES — ENGINEERING CONSULTANTS, 3788 McGRAY STREET, RIVERSIDE, CA. 92506, PH. (951) 686-1070, FAX (951) 788-1256	W.O.	
DATE: 11/01/13		SHEET	1
DESIGNED: DJ		OF	1 SHEETS
CHECKED: RB	G:\2013\13-0268\DRAWINGS\ENTITLEMENTS\13-0268PP.DWG	DWG. NO.	
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F.B.			

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

September 24, 2012

Trammell Crow Company
3501 Jamboree Road, Suite 230
Newport Beach, California 92660

Attention: Mr. David Drake
Senior Vice President

Project No.: **12G189-2**

Subject: **Results of Infiltration Testing**
Proposed Dorado Logistics Center
NEC Perris Boulevard and Modular Way
Moreno Valley, California

Reference: Geotechnical Investigation and Liquefaction Evaluation, Proposed Dorado Logistics Center, NEC Perris Boulevard and Modular Way, Moreno Valley, California, prepared by Southern California Geotechnical, Inc. (SCG), prepared for Trammell Crow Company, SCG Project No. 12G189-1.

Gentlemen:

In accordance with your request, we have conducted infiltration testing at the subject site. We are pleased to present this report summarizing the results of the infiltration testing and our design recommendations.

Scope of Services

The scope of services performed for this project was in general accordance with our Proposal No. 12P308, dated August 27, 2012. The scope of services included a surface reconnaissance, subsurface exploration, field testing, and geotechnical engineering analysis to determine the infiltration rate of the onsite soils. The infiltration testing was performed in general accordance with the ASTM Test Method D-3385-03, Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer.

Site and Project Description

The subject site is located at the northeast corner of North Perris Boulevard and Modular Way in Moreno Valley, California. The site is bounded to the west by Perris Boulevard, to the south by Modular Way, to the north by a vacant lot, and to the east by Kitching Street. The General Location of the site is illustrated on the Site Location Map, included as Plate 1 of this report.

The subject site is a rectangular-shaped parcel, approximately 51.7± acres in size. The western half of the site is currently developed as a manufacturing facility for the El Dorado Stone company. This facility is developed with one (1) manufacturing building, 130,380± ft^2 in size and one (1) two-story office building, 6,593± ft^2 in size. The manufacturing building is a metal frame structure and is located in the west-central region of the site. The office building appears to be of concrete tilt-up construction and is located in the southwest region of the site. Both of

these buildings are presumably supported on conventional shallow foundations with concrete slab-on-grade floors. Ground surface cover in the western half of the site consists of Portland cement concrete pavements in the storage, parking, and drive lane areas and surrounds the existing buildings. Crushed aggregate base is located in the northeastern and southeastern areas of the western half of the site.

The eastern half of the site is currently vacant and undeveloped. A storm water detention basin with approximate dimensions of 420± feet by 580± feet is located in the southwestern region of the eastern half of the site. The detention basin is approximately 5 to 8± feet deep. The remaining areas within the eastern half of the site consist of exposed soils with sparse amounts of native weed and grass growth.

The conceptual site plan for the proposed development was provided to our office by the client. This plan indicates that one (1) new commercial/industrial building will be constructed at the subject site. The building will be rectangular in shape and have a footprint of 1,130,000± ft^2. The plan also indicates a cross dock configuration with dock high doors along the north and south sides of the building. The areas surrounding the building will be paved with asphaltic concrete pavements in the parking and drive lane areas and Portland cement concrete pavements in the loading dock and flatwork areas. Landscape planters are expected to be included throughout the site.

One (1) infiltration/detention basin will be used to store and/or dispose of storm water at the subject site. This storm water infiltration/detention basin will be located along the eastern property line. Based on conversations with the client, depth of the basin will range from 4 to 6± feet below existing site grades.

Concurrent Studies

SCG is currently conducting a geotechnical investigation of the subject site. As a part of this study, a total of eleven (11) borings were advanced to depths of 5 to 50± feet below the existing site grades.

Boring Nos. B-1 through B-3 were drilled through existing pavements. At these locations, the pavements consist of 5 to 7± inches of Portland cement concrete with no discernible layer of aggregate base. Borings Nos. B-4 through B-6 were drilled through 2 to 3± inches of aggregate base. Artificial fill soils were encountered beneath the pavements and aggregate base at all of the borings within the El Dorado Stone facility extending to a depth of 3 to 9± feet. At these boring locations, the fill soils generally consist of mottled stiff to very stiff silty clays, fine sandy clays, and fine to medium sandy clays.

Native alluvial soils were encountered beneath the fill soils or at the ground surface at all of the boring locations. The alluvial soils consist of interbedded stiff to very stiff silty clays, clayey silts, and medium dense silty fine sands and fine sandy silts extending to the maximum depth explored of 50± feet.

Free water was encountered during drilling of Boring No. B-7 at a depth of approximately 25± feet below the existing site grades. Based on the moisture contents of the recovered soil

samples, the static groundwater table is considered to have existed at a depth of 25± feet at the time of the subsurface exploration.

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for the current phase of this project consisted of two (2) backhoe excavated trenches. Infiltration Test Locations I-1 and I-2 were excavated to depths of 6± and 4± feet, respectively. The approximate locations of the infiltration testing (identified as I-1 and I-2) are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Geotechnical Conditions

The soil conditions encountered at the infiltration test trenches were generally similar to those encountered during the concurrent geotechnical investigation at the site. Native alluvial soils were encountered at the ground surface at both of the test locations. The alluvial soils encountered generally consist of medium dense to dense silty fine sands to fine sandy silts extending to the maximum depth explored of 6± feet below site grades. These alluvial soils possess abundant amounts of calcareous nodules/veining and slight cementation. The apparent moisture contents of the encountered soils were damp to moist. No free water was encountered during the excavation of the trenches. The Trench Logs, which illustrate the conditions encountered at the trench locations, are included with this report.

Infiltration Testing

We understand that the results of the testing will be used to prepare a preliminary design for a storm water retention/disposal system that will be used to dispose of surface water runoff at the subject site. As previously stated, the infiltration testing was performed in general accordance with ASTM Test Method D-3385-03, Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer.

Two stainless steel infiltration rings were used for the infiltration testing. The outer infiltration ring is 2 feet in diameter and 20 inches in height. The inner infiltration ring is 1 foot in diameter and 20 inches in height. At each test location, the outer ring was driven 3± inches into the soils at the base of the trench. The inner ring was centered inside the outer ring and subsequently driven 3± inches into the soils at the base of the trench. The rings were driven into the soil using a ten pound sledge hammer. The soils surrounding the wall of the infiltration rings were only slightly disturbed during the driving process.

The infiltration testing was performed at infiltration test locations I-1 and I-2. The infiltration testing consisted of filling the inner ring and the annular space (the space between the inner and outer rings) with water, approximately 3 to 4± inches above the soil. To prevent the flow of water from one ring to the other, the heads in both the inner ring and annular space between the rings were maintained using the constant-head float valves. The volume of water that was added to maintain a constant head in the inner ring and the annular space during each time

interval was determined and recorded. A cap was placed over the rings to minimize the evaporation of water during the test.

The schedule for readings was determined based on the observed soil type at the base of each of the backhoe excavated trenches. Readings for each infiltration test were taken at intervals ranging from 15 minutes to 30 minutes. The length of the intervals was increased as the testing progressed due to decreasing infiltration rates as the soils became more saturated. The water volume readings are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on the spreadsheets.

The infiltration rate for the tests are calculated in centimeters per hour and then converted to inches per hour. These rates are summarized below:

Infiltration Test No.	Infiltration Rate (inches/hr)
I-1	1.13
I-2	0.97

Design Recommendations

The following recommendations are based on the results of the infiltration testing at two (2) discrete locations and from observations made during the subsurface exploration. The soils encountered at infiltration test locations I-1 and I-2, generally consist of medium dense fine sandy silts. **Based on the infiltration test results, we recommend that an infiltration rate of 1.0 inches per hour be used in the design of the proposed detention/infiltration basin located along the eastern property line of the site.** This value does not include a factor of safety. It is important to note that this design rate is only applicable to the native alluvial fine sandy silt material encountered.

The design of the storm water infiltration system should be performed by the project civil engineer, in accordance with the County of Riverside and/or city of Moreno Valley guidelines. However, it is recommended that the system be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the storm water detention/infiltration basin. The presence of such materials would decrease the effective infiltration rates. **The infiltration rate recommended above is based on the assumption that only clean water will be introduced to the subsurface profile. Any fines, debris, or organic materials could significantly impact the infiltration rate.** It should be noted that the recommended infiltration rate is based on infiltration testing at two discrete locations and the overall infiltration rate of the storm water detention/infiltration basin could vary considerably. Based on these considerations, **the designer of the system may apply a factor of safety to the recommended infiltration rates at his discretion.**

Infiltration versus Permeability

Infiltration rates are based on unsaturated flow. As water is introduced into soils by infiltration, the soils become saturated and the wetting front advances from the unsaturated zone to the saturated zone. Once the soils become saturated, infiltration rates become zero, and water can only move through soils by hydraulic conductivity at a rate determined by pressure head and soil permeability. The infiltration rates presented herein were determined in accordance with the

ASTM Test Method D-3385-03 standard, and are considered valid for the time and place of the actual test. Changes in soil moisture content will affect these infiltration rates. Infiltration rates should be expected to decrease until the soils become saturated. Soil permeability values will then govern groundwater movement. Permeability values may be on the order of 10 to 20 times less than infiltration rates. The system designer should incorporate adequate factors of safety and allow for overflow design into appropriate traditional storm drain systems, which would transport storm water off-site.

Location of Infiltration System

The use of on-site storm water infiltration systems carries a small risk of creating adverse geotechnical conditions. Increasing the moisture content of the soil can cause the soil to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Structures and pavements near the infiltration areas could potentially be damaged due to saturation of subgrade soils. If possible, the proposed infiltration/detention basin for this site should be located at least 25 feet away from any structures, including retaining walls. Even with this provision of locating the infiltration system at least 25 feet from the building, it is possible (although not likely) that infiltrating water into the subsurface soils could have an adverse effect on the proposed structure. It should also be noted that utility trenches which happen to collect storm water can also serve as conduits to transmit storm water toward the structure, depending on the slope of the utility trench. Therefore, consideration should also be given to the proposed locations of underground utilities which may pass near the proposed infiltration system.

General Comments

This report has been prepared as an instrument of service for use by the client in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, structural engineer, and/or civil engineer. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between trench locations and testing depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to

our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted.
The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

Closure

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

Daniel Mourad
Staff Engineer

REGISTERED PROFESSIONAL ENGINEER
JOHN A. SEMINARA
No. 2294
GEOTECHNICAL
STATE OF CALIFORNIA

John A. Seminara, GE 2294
Principal Engineer

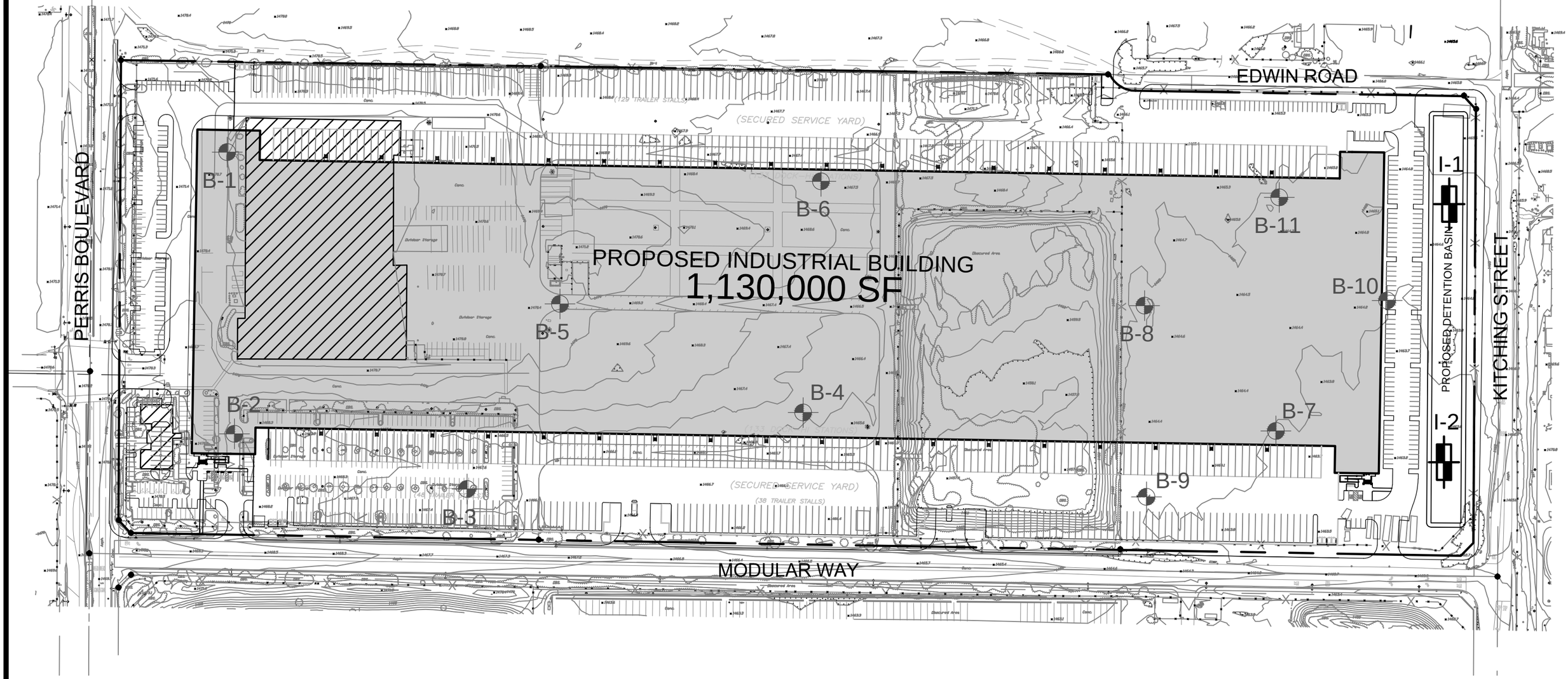
Distribution: (2) Addressee
(2) Webb Associates, Attn: Robert Berndt

Enclosures: Plate 1 Site Location Map
Plate 2 Infiltration Test Location Plan
Trench Logs (2 pages)
Infiltration Test Results Spreadsheet (2 pages)

SOURCE: RIVERSIDE COUNTY
THOMAS GUIDE, 2009

SITE LOCATION MAP
PROPOSED DORADO LOGISTICS CENTER
MORENO VALLEY, CALIFORNIA
SCALE: 1" = 2400'
DRAWN: DM CHKD: JAS
SCG PROJECT 12G189-2
PLATE 1

SOUTHERN CALIFORNIA GEOTECHNICAL



GEOTECHNICAL LEGEND

- APPROXIMATE INFILTRATION TEST LOCATION
- APPROXIMATE BORING LOCATION FROM CONCURRENT STUDY
- PROPOSED INDUSTRIAL BUILDING
- EXISTING BUILDING TO BE DEMOLISHED

NORTH
SoCalGeo

NOTE: BASE MAP PREPARED BY WEBB ASSOCIATES

BORING LOCATION PLAN

PROPOSED DORADO LOGISTICS CENTER

MORENO VALLEY, CALIFORNIA

SCALE: 1" = 180'

DRAWN: DM
CHKD: JAS

SCG PROJECT
12G189-2

PLATE 2

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL

SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-2

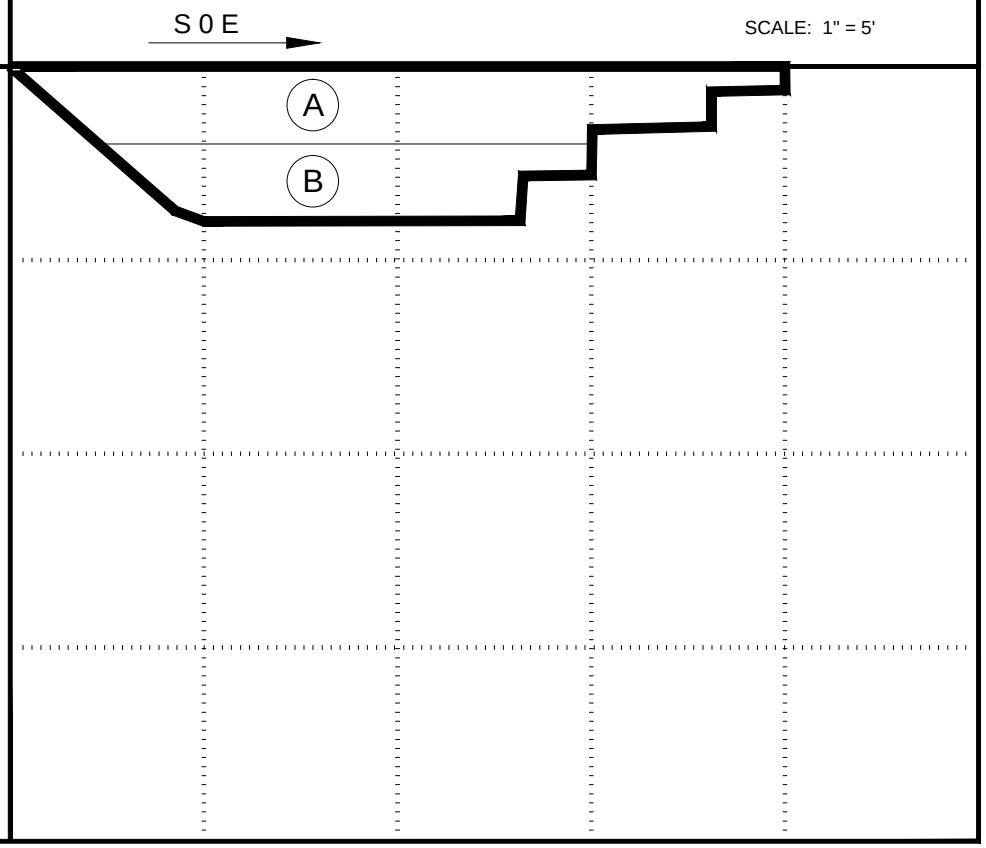
JOB NO.: 12G189-2
PROJECT: Proposed Dorado Logistics Center
LOCATION: Moreno Valley, CA
DATE: 09-05-12

EQUIPMENT USED: Backhoe
LOGGED BY: Danny Mourad
ORIENTATION: S 0 E
ELEVATION: 1463.5'

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
				A: ALLUVIUM: Brown to Light Brown Silty fine Sand to fine Sandy Silt, trace Clay, abundant calcareous nodules, very porous, trace fine root fibers, cemented, medium dense-damp
				B: ALLUVIUM: Light Gray Brown fine Sandy Silt, trace to little Clay, abundant calcareous nodules, very porous, cemented, dense-moist
				Trench Terminated @ 4'
5				
10				
15				

GRAPHIC REPRESENTATION



KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

TRENCH LOG

PLATE B-2

SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-1

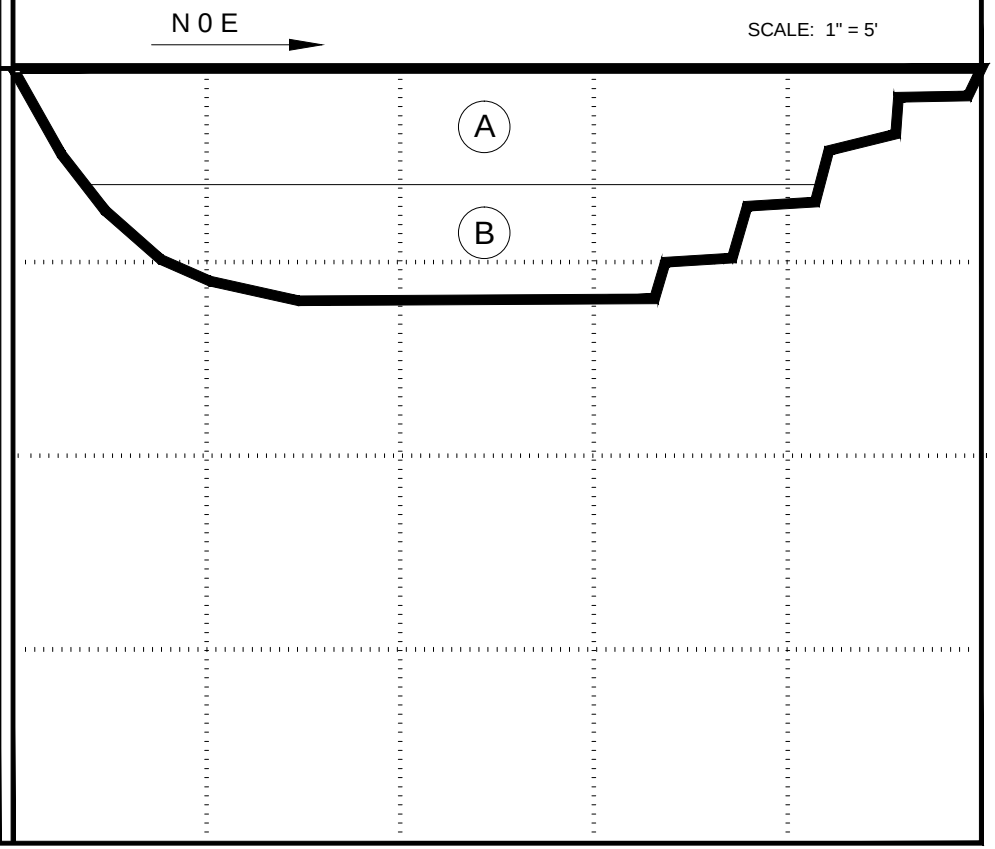
JOB NO.: 12G189-2
PROJECT: Proposed Dorado Logistics Center
LOCATION: Moreno Valley, CA
DATE: 09-05-2012

EQUIPMENT USED: Backhoe
LOGGED BY: Danny Mourad
ORIENTATION: N 0 E
ELEVATION: 1465'

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
				A: ALLUVIUM: Light Brown to Light Gray Brown Silty fine Sand to fine Sandy Silt, trace Clay, abundant calcareous nodules, very porous, trace fine root fibers, medium dense-damp
				B: ALLUVIUM: Light Gray Brown fine Sandy Silt, trace Clay, abundant calcareous veining/nodules, very porous, medium dense to dense-damp to moist
5				Trench Terminated @ 6'
10				
15				

GRAPHIC REPRESENTATION



KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

TRENCH LOG

PLATE B-1

INFILTRATION CALCULATIONS

Project Name	Proposed Dorado Logistics Ctr
Project Location	Moreno Valley, California
Project Number	12G189-2
Engineer	DM

Infiltration Test No: I-1

Constants	Diameter (ft)	Area (ft^2)	Area (cm^2)
Inner	1	0.79	730
Anlr. Spac	2	2.36	2189

*Note: The infiltration rate was calculated based on current time interval

Test Interval		Time (hr)	Interval **Elapsed** (min)	Flow Readings: Inner Ring (ml)	Ring Flow (cm^3)	Annular Ring (ml)	Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Annular Space* (cm/hr)	Inner Ring* (in/hr)	Annular Space* (in/hr)
1	Initial	9:08 AM	15	300	2900	600	6300	15.90	11.51	6.26	4.53
	Final	9:23 AM	**15**	3200		6900					
2	Initial	9:24 AM	30	50	1800	200	5300	4.93	4.84	1.94	1.91
	Final	9:54 AM	**46**	1850		5500					
3	Initial	9:55 AM	30	50	1300	200	4400	3.56	4.02	1.40	1.58
	Final	10:25 AM	**77**	1350		4600					
4	Initial	10:25 AM	32	1350	1200	4600	4500	3.08	3.85	1.21	1.52
	Final	10:57 AM	**109**	2550		9100					
5	Initial	10:58 AM	30	100	1100	300	4100	3.02	3.75	1.19	1.47
	Final	11:28 AM	**140**	1200		4400					
6	Initial	11:28 AM	30	1100	1050	4400	3700	2.88	3.38	1.13	1.33
	Final	11:58 AM	**170**	2150		8100					
7	Initial	11:59 AM	30	50	1050	0	3800	2.88	3.47	1.13	1.37
	Final	12:29 PM	**201**	1100		3800					

INFILTRATION CALCULATIONS

Project Name	Proposed Dorado Logistics Ctr
Project Location	Moreno Valley, California
Project Number	12G189-2
Engineer	DM

Infiltration Test No: I-2

Constants	Diameter (ft)	Area (ft^2)	Area (cm^2)
Inner	1	0.79	730
Anlr. Spac	2	2.36	2189

*Note: The infiltration rate was calculated based on current time interval

Test Interval		Time (hr)	Interval **Elapsed** (min)	Flow Readings: Inner Ring (ml)	Ring Flow (cm^3)	Annular Ring (ml)	Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Annular Space* (cm/hr)	Inner Ring* (in/hr)	Annular Space* (in/hr)
1	Initial	9:44 AM	15	450	2150	1100	8300	11.79	15.17	4.64	5.97
	Final	9:59 AM	**15**	2600		9400					
2	Initial	10:00 AM	30	50	2000	100	8700	5.48	7.95	2.16	3.13
	Final	10:30 AM	**46**	2050		8800					
3	Initial	10:31 AM	30	0	1300	300	6700	3.56	6.12	1.40	2.41
	Final	11:01 AM	**77**	1300		7000					
4	Initial	11:02 AM	30	50	950	400	6400	2.60	5.85	1.03	2.30
	Final	11:32 AM	**108**	1000		6800					
5	Initial	11:33 AM	30	150	900	200	6300	2.47	5.76	0.97	2.27
	Final	12:03 PM	**139**	1050		6500					
6	Initial	12:04 PM	30	100	900	600	6200	2.47	5.66	0.97	2.23
	Final	12:34 PM	**170**	1000		6800					

Appendix 4: Historical Site Conditions

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

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

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

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	Albert A. Webb Associates	Date	10/31/2013
Designed by	EA	Case No	13-0268
Company Project Number/Name	Modular Logistics Center		

BMP Identification

BMP NAME / ID: Retention Basin

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}= 0.68 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)*
Comm./ Industrial	*911032*	*Concrete or Asphalt*	*1*	*0.89*	*812640.5*			
Building	*1109378*	*Roofs*	*1*	*0.892*	*989565.2*			
Landscape	*187000*	*Ornamental Landscaping*	*0.1*	*0.110458*	*20655.6*			
	2207410		***Total***		**1822861.3**	**0.68**	***103295.5***	***103300***

Notes:

Extended Detention Basin Design Procedure		BMP Subarea No. 1	Legend:	Required Entries / Calculated Cells
Company Name:	Albert A. Webb Associates		Date:	
Designed by:	EA		County/City Case No.:	13-0268

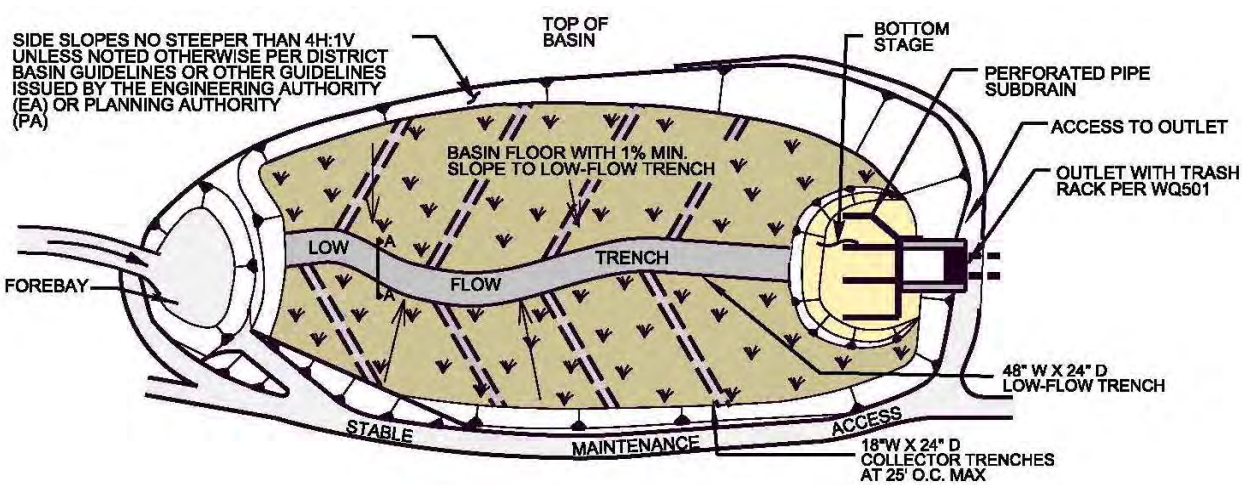
Design Volume

Tributary Area (BMP Subarea)	A_T =	50.7	acres
Enter V_{BMP}, determined from Section 2.1 of this Handbook	V_{BMP}=	103,300	ft^3

Basin Footprint

Overall Geometry

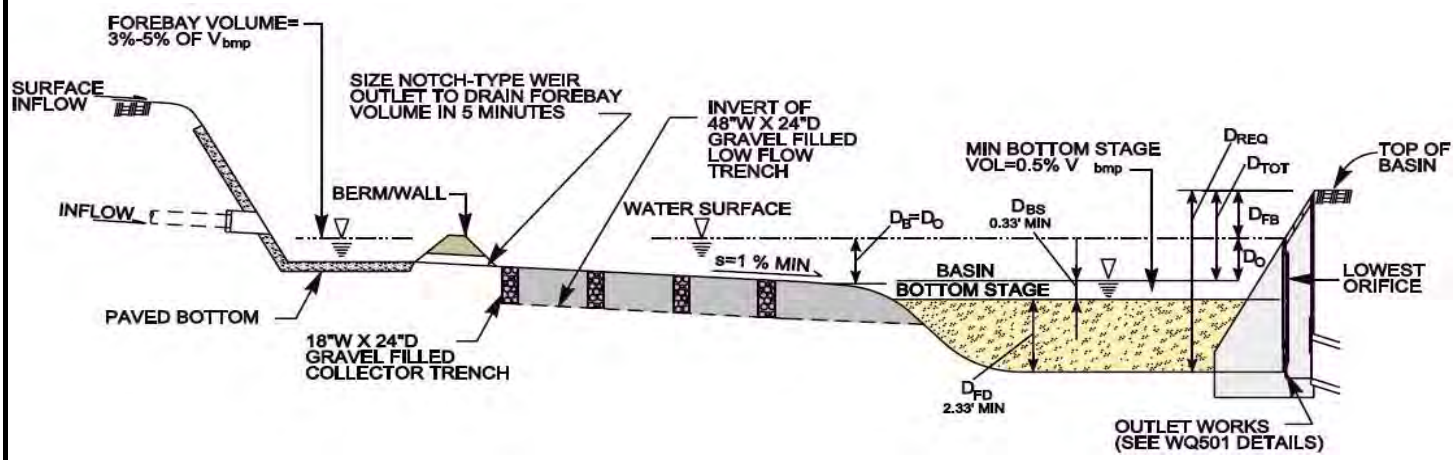
Length at Basin Bottom Surface	Length =	650	ft
Width at Basin Bottom Surface	Width =	45	ft
	Meets 1.5 : 1 requirement?	14.44444	
Side Slopes per "Basin Guidelines", Sect. 1.2 — H:V < 4:1, Verify Consistency with Basin Guidelines, Section 1.2	z =	3	:1
Proposed Basin Depth (with no freeboard)	D_B =	2.60	ft
Depth of freeboard (if used)	D_{FB} =	1.00	ft
Minimum Required Allowance for Total Depth (including proposed basin depth, freeboard, minimum depth of bottom stage (D_{BS}=0.33') and minimum filter depth (D_{FD}=2.33'))	D_{REQ} =	6.3	ft
Depth from design water surface elevation to lowest orifice	D_O =	2.6	ft



Basin Design

Basin Design

Proposed Total Basin Depth (proposed depth plus freeboard)	D_{TOT} =	3.60	ft
Basin Invert Longitudinal Slope	Slope =	1.00	%
Basin Invert Transverse Slope (1% min)	Slope =	1	%
Basin Volume	V_{Basin} =	103300	ft^3



Forebay Design

Forebay Volume (3 - 5% V_{BMP})	V_{FB} =	3100	ft^3
Forebay Depth (height of berm)	D_{FBY} =	1	ft
Minimum Forebay Surface Area	A_{FB} =	3100	ft^2
Rectangular weir (notch)	W =	6.00	in

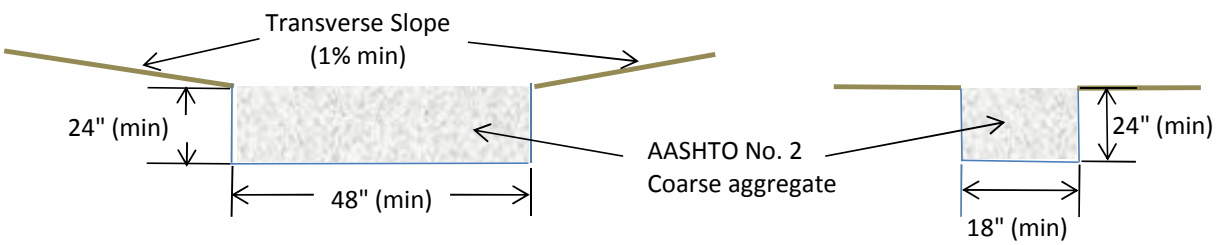
Dry Weather and Low-Flow Management

Low-Flow Trench (see graphic below)

Depth (24 inches minimum, gravel filled)	Depth =	24	inches
Width (48 inches minimum)	Width =	48	inches
Trench Invert Longitudinal Slope	Slope =	1	%

Collector Trenches (see graphic below)

Depth (24 inches minimum)	Depth =	24	inches
Width (18 inches minimum)	Width =	18	inches
Trench Invert Longitudinal Slope	Slope =	1	%
Spacing (25 feet on center maximum)	S =	25	feet



Low-Flow Trench **Collector Trench**

Bottom Stage (Sand Filter) Design

Depth of the Bottom Stage (4" minimum ponding)	D_{BS} =	4	in
Surface Area of Bottom Stage	A_{BS} =	1600	ft^2
Dry Weather Ponded Volume (above sand layer)	V_{BS} =	533	ft^3

Is V_{BS} no less than 0.5% V_{BMP}? OK

Depth of ASTM-C33 sand (18 inch minimum)

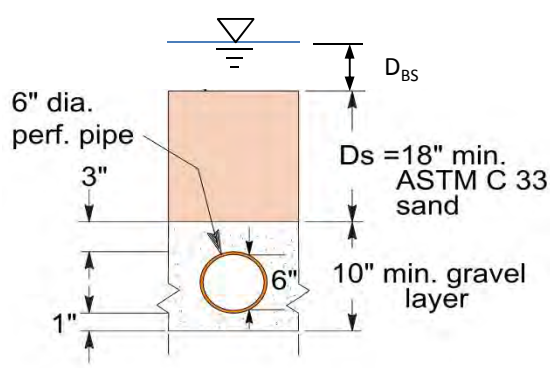
Ds = 24 inches

Diameter of Subdrains

ϕ = 6 in

Subdrain Spacing

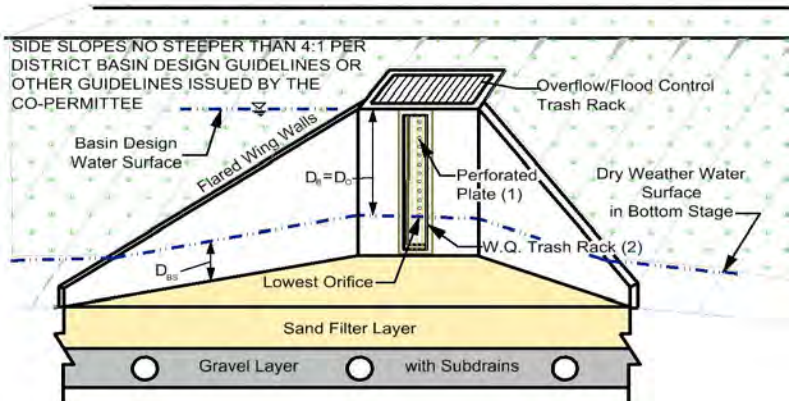
s = 20 ft. on center



Basin Outlet Design

Outlet Design

Assume an orifice area. Based on the information provided above, the spreadsheet provides discharge vs. stage data. Enter the volume vs. stage data for each interval. This information is used to route the volume through the basin. The size of the orifice is acceptable when the data shows that less than 50% of V_{BMP} has drained in 24 hours, and that 100% drawdown occurs within 72 hours.



Flow Rate, Q (cfs)

$$Q=CA[2g(H-H_o)]^{0.5}$$

Discharge Coefficient,

Default, C = 0.66

Other, C =

Orifice Area (ft^2)

Orifice Diameter, d; number of orifices per row, n; and number of orifice rows, N (from the bottom up).

d = 2.25 inches

n = 3 per row

N = 1 rows

Aeff = 0.083 ft^2 per row

or

Aeff = 11.922 in^2 per row

From outflow hydrograph, the time where 50% of V_{BMP} has drained from the basin (24 hour minimum):

Time (50%) = 24.67 hrs

OK

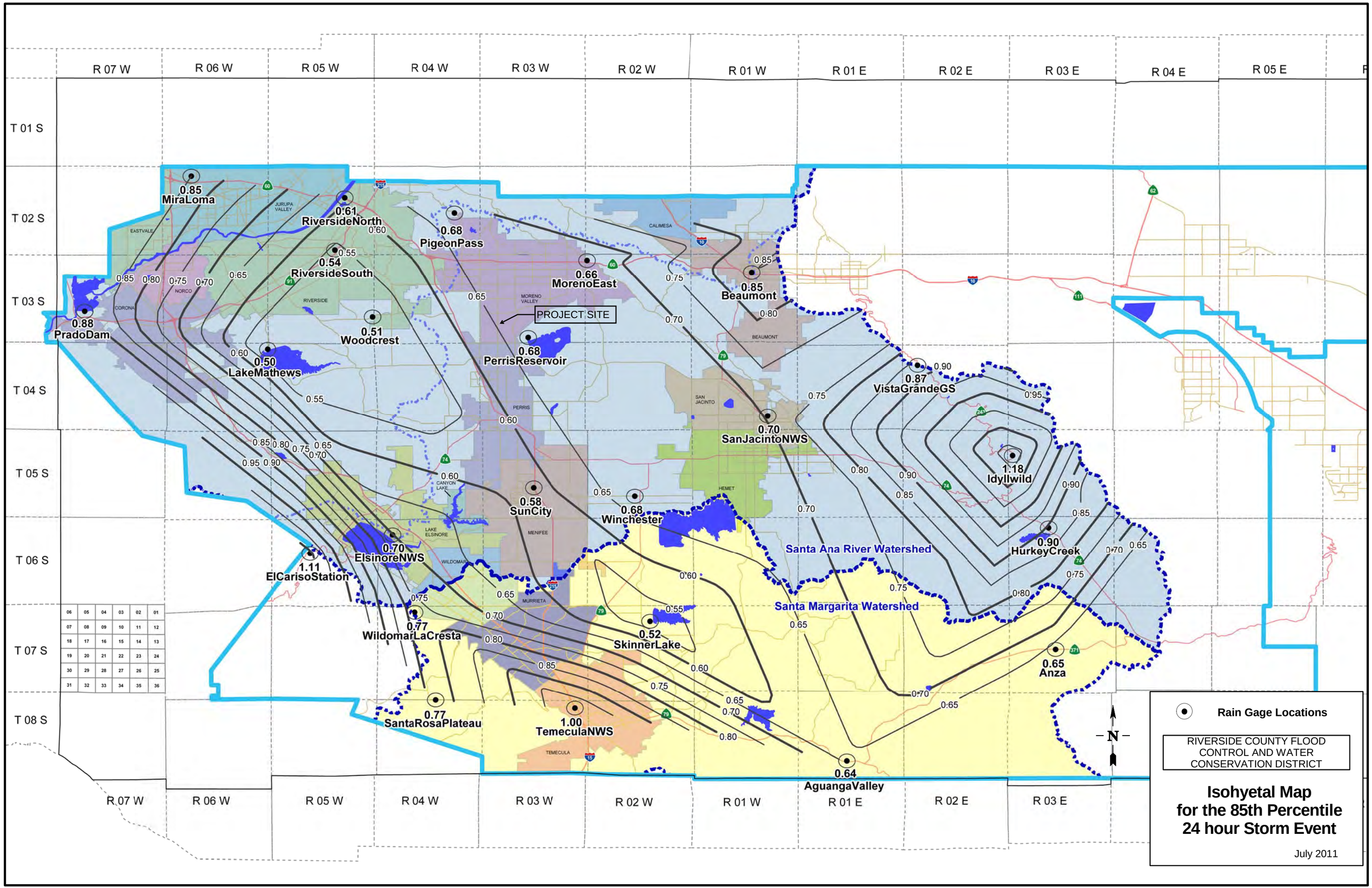
From outflow hydrograph, the time where 100% V_{BMP} has drained from the basin(within 72 hours):

Time (100 %) = 77.95 hrs

Redesign. 72 hour maximum *

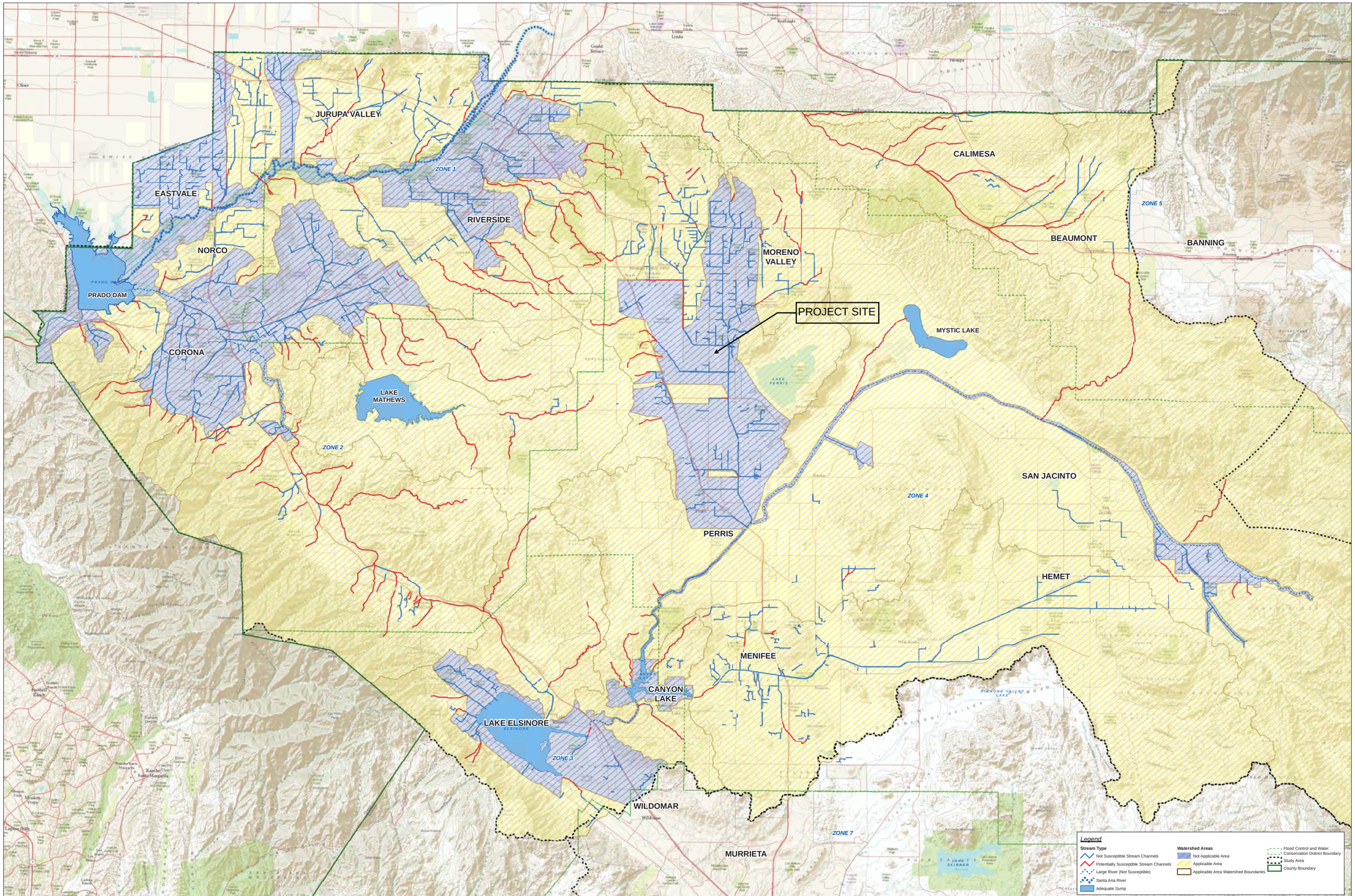
Headwater Elev. / Stage (ft)	Discharge (cfs)	Volume (acre-ft)	Δt (hrs.)
0	0.0000	0.0000	
0.33	0.2530	0.256	24.48
0.67	0.3581	0.533	10.97
1.00	0.4385	0.815	8.57
1.33	0.5063	1.110	7.56
1.67	0.5662	1.428	7.18
2.00	0.6201	1.750	6.57
2.33	0.6698	2.086	6.30
2.67	0.7071	2.446	6.33
3.00			
3.33			
3.67			
4.00			
4.33			
4.67			
5.00			
5.33			
5.67			
6.00			
6.33			
6.67			
7.00			
7.33			
7.67			
8.00			
8.33			
8.67			
9.00			
9.33			
9.67			
10.00			
		∑ =	77.95

Notes: Considering the infiltration of 1 in/hr, the 27,000 sq.ft. bottom area will result in additional 0.2 cfs outlet infiltration rate (safety factor of 3 used), which will reduce drawdown time below the 72-hours limit with up to additional 14 hours.


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
0.85 MiraLoma
0.61 RiversideNorth
0.68 PigeonPass
0.54 RiversideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.68 PerrisReservoir
0.50 LakeMathews
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
PROJECT SITE
Santa Ana River Watershed
Santa Margarita Watershed
EASTVALE
JURUPA VALLEY
CORONA
NORCO
RIVERSIDE
MORENO VALLEY
CALIMESA
BEAUMONT
SAN JACINTO
PERRIS
HEMET
CANYON LAKE
LAKE ELSINORE
WILDOMAR
MENIFEE
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

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern



HCOC Applicability Map

Hydromodification Susceptibility Documentation Report and Mapping
Riverside County Flood Control and Water Conservation District

Map 2

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

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.**

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.**	☐ **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.**		❑ **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.**	

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 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

The materials provided below are for reference. This Appendix will be completed and addressed during the Final WQMP submittal.

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:

CITY CLERK
CITY OF MORENO VALLEY
PO BOX 88005
14177 FREDERICK STREET
MORENO VALLEY, CA 92552-0805

EXEMPT FROM FEE PER G.C. Section 6103

SPACE ABOVE THIS LINE FOR RECORDER'S USE

STORMWATER TREATMENT DEVICE AND CONTROL MEASURE ACCESS AND MAINTENANCE COVENANT

Assessor's Parcel Number(s) _____

THIS INSTRUMENT is made and entered into this _____ day of _____, by and between _____, hereinafter referred to as "Owner/Lessee," and the City of Moreno Valley, a municipal corporation, hereinafter referred to as "City."

RECITALS

WHEREAS, the Owner/Lessee owns/is leasing real property ("Property") in the City specifically described in Exhibit "A," which is attached hereto and incorporated herein by this reference; and

WHEREAS, at the time of approval of the development project known as _____ (the "Project") for the Property, the City required the Project to employ on-site storm water and non-storm water control measures to mitigate the Project impacts to water quality and minimize pollutants in urban storm water runoff; and

WHEREAS, the City and Owner/Lessee, its successors, and assigns, agree that the health, safety and welfare of the residents of the City, require that on-site storm water and non-storm water management control measures be constructed and implemented and adequately maintained on the Property; and

WHEREAS, the Owner/Lessee has chosen to install _____, hereinafter referred to as the "Device" and other control measures all as described in the Final Water Quality Management Plan (WQMP) to minimize pollutants in urban storm water and non-storm water runoff; and

WHEREAS, the Device and other control measures have been installed and/or implemented in accordance with the WQMP, project plans and specifications approved by the City; and

WHEREAS, the Device and other control measures, being installed on private property and draining only private property are private facilities with all maintenance or replacement therefore being the sole responsibility of the Owner/Lessee; and

WHEREAS, the Owner/Lessee is aware that periodic and continuous maintenance including, but not necessarily limited to, filter material replacement and sediment removal is required to assure discharges from the Device, other control measures and the Project are in compliance with the City's Municipal Code for storm water and non-storm water discharges and that such maintenance activity will require compliance with all Federal, State and local laws and

regulations, including those pertaining to confined space and waste disposal methods in effect at the time such maintenance occurs;

NOW, THEREFORE, in consideration of City's approval of the Project and the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the City and Owner/Lessee agree as follows:

1. The Owner/Lessee hereby provides the City and its designees with full right of access to the Device and other control measures and the immediate vicinity of the property at any time, upon reasonable notice; or in the event of emergency, as determined by City's Public Works Director/City Engineer or designees, no advance notice; for the purpose of inspection, sampling and testing of the Device and other control measures, and in cases of emergency, where the public health, safety, or welfare is compromised, such emergency shall be declared a "nuisance" as defined in the Municipal Code. Such conditions that created the emergency shall be abated as provided for in the Municipal Code and at the Owner's/Lessee's expense as provided for in Section 3, below.

2. The Owner/Lessee shall diligently maintain the Device and other control measures in a manner assuring all discharges from the Device, other control measures and the Project are in compliance with the Municipal Code for storm water and non-storm water discharges at all times. All reasonable precautions shall be exercised by the Owner/Lessee and the Owner's/Lessee's representatives in the removal and extraction of materials from the Device and other control

measures, and the ultimate disposal of the materials in a manner consistent with all applicable laws. As may be requested from time to time by the City, the Owner/Lessee shall provide the City with documentation identifying the materials removed, the quantity and the recycle of disposal destinations, as appropriate.

3. In the event the Owner/Lessee fails to perform the necessary maintenance contemplated by this Instrument, within five (5) days of being given written notice by the City, the lack of maintenance shall be considered a public health and safety concern and declared a "nuisance", the City shall take all necessary actions as provided in the Municipal Code, to abate the nuisance and charge the entire cost and expense to the Owner/Lessee, including administrative costs, attorneys' fees and interest thereon at the maximum rate authorized by law from the date of the notice of expense until paid in full. Additionally, any discharge as a result from the lack of maintenance prescribed herein from the Device to the City's maintained Municipal Separate Storm Sewer System shall be considered an illegal discharge and considered a violation of the Municipal Code and shall cease immediately. Such cessation may include a yellow or red tag issued to the Project.

4. This Instrument shall be recorded in the Official Records of the County of Riverside at the expense of the Owner/Lessee and shall constitute notice to all successors and assigns to the title to the Property of the obligations herein set forth. This Instrument shall also constitute a lien against the Property in such amount as will fully reimburse the City, including interest as herein above set

forth, subject to foreclosure in event of default in payment.

6. It is the intent of the Owner/Lessee that the burdens and benefits herein undertaken shall constitute covenants that run with the Property and shall constitute a lien against the Property.

7. This covenant imposes no liability of any kind whatsoever on the City and the Owner/Lessee agrees to hold the City harmless from any liability in the event the Device and other control measures fail to operate in accordance with the plans and specification submitted to the City.

8. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the Owner/Lessee hereto. The term "Owner"/ "Lessee" shall include not only the Owner/Lessee, but also its heirs, successors, executors, administrators, lessees and assigns. The Owner/Lessee shall notify any successor to title of all or part of the Property about the existence of this Instrument. The Owner/Lessee shall provide such notice prior to such successor obtaining an interest in all or part of the Property. The Owner/Lessee shall provide a copy of such notice to the City at the same time such notice is provided to the successor.

9. Time is of the essence in the performance of this Instrument.

10. Any notice to a party required or called for in this Instrument shall be served in

person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change notice address only by providing written notice thereof to the other party.

CITY:	OWNER/LESSEE:
Public Works Director/City Engineer	Name: _____
City of Moreno Valley	Company: _____
PO Box 88005	Address: _____
14177 Frederick Street	City/State/ZIP: _____
Moreno Valley, CA 92552-0805	

11. This Instrument represents the entire Covenant of the parties hereto as to the matters contained herein and supersedes any and all prior written or verbal agreements between the parties as to the subject matter hereof.

12. This Instrument shall be governed by and construed in accordance with the laws of the State of California.

13. No amendment to this Instrument shall be made without prior written approval by the City.

APPROVED AS TO FORM:

_____
Robert D. Herrick, City Attorney

OWNER/LESSEE:

_____
(Name, Title)

CITY:

CITY OF MORENO VALLEY

By:_____
Name: Robert G. Gutierrez
Title: City Manager

ATTEST:

_____
Alice Reed, City Clerk

EXHIBIT "A"

Legal Description

Maintenance Guidelines

Schedule	Inspection and Maintenance Activity
During every scheduled maintenance check (per below), and *as needed* at other times	• Maintain vegetation as needed. Use of fertilizers, pesticides and herbicides should be strongly avoided to ensure they don't contribute to water pollution. If appropriate native plant selections and other IPM methods are used, such products shouldn't be needed. If such projects are used: o Care should be taken to avoid contact with the low-flow or other trenches, and the media filter in the bottom stage. o Products shall be applied in accordance with their labeling, especially in relation to application to water, and in areas subjected to flooding. o Fertilizers should not be applied within 15 days before, after, or during the rainy season. • No ponded water should be present for more than 72 hours to avoid nuisance or vector problems. No algae formation should be visible. Correct problems as needed.
Annually. If possible, schedule these inspections before the beginning of the rain season to allow for any repairs to occur before rains occur.	• Remove debris and litter from the entire basin • Inspect hydraulic and structural facilities. Examine the outlet for clogging, the embankment and spillway integrity, as well as damage to any structural element. • Check for erosion, slumping and overgrowth. Repair as needed. • Inspect sand media at the filter drain to verify it is allowing acceptable infiltration. **Scarify top 3 inches by raking the filter drain's sand surface annually.** • Check the media filter underdrains (via the cleanout) for damage or clogging. Repair as needed. • Remove accumulated sediment and debris from the forebay, and ensure that the notch weir is clear and will allow proper drainage. • Check gravel filled low flow and collector trenches for sediment buildup and repair as needed.
Every 5 years or sooner (depending on whether observed drain times to empty the basin are less than 72 hours).	• Remove the top 3 inches of sand from the filter drain and backfill with 3 inches of new sand to return the sand layer to its original depth. When scarification or removal of the top 3 inches of sand is no longer effective, remove and replace sand filter layer.
Whenever substantial sediment accumulation has occurred.	• Remove accumulated sediment from the bottom of the basin. Removal should extend to original basin depth.

Maintenance

Sand Filter Extended Detention Basin Maintenance Recommendations

Required Action	Maintenance Objectives	Frequency
Debris and litter removal	Remove debris and litter from detention area to minimize clogging of the sand media.	Routine – Depending on aesthetic requirements.
Inspections	Inspect detention area to determine if the sand media is allowing acceptable infiltration. Also inspect the underdrain outlet if one is present, including the orifice plate to make sure it is there and in operating condition.	Routine – Every one to two years inspect for hydraulic performance. If possible, schedule these inspections within 24 hours after a significant rainfall.
Scarify filter surface	Scarify top 3 inches by raking the filter's surface.	Once per year or when needed to promote drainage.
Sand filter removal	Remove the top 3 inches of sand from the sand filter. After a second removal, backfill with 6 inches of new sand to return the sand depth to 18 inches. Minimum sand depth is 15 inches.	If no construction activities take place in the tributary watershed, every 2 to 5 years depending on observed drain times, namely when it takes more than 40 hours to empty 3-foot deep pool. Otherwise more often.

Example of Extended Detention Basin Maintenance Plan for Modular Logistics Center

Date:_____

Project Address and Cross Streets_____

Assessor's Parcel No.: _____

Property Owner: _____ Phone No.:_____

Designated Contact: _____ Phone No.:_____

Mailing Address:_____

The property contains (two) 2 extended detention basins (hydraulically connected together with an equalization pipe), located as described below and as shown in the attached site plan.

- **Extended Detention Basins** are located at easterly property boundary along Kitching Street.

I. Routine Maintenance Activities

Primary maintenance activities include vegetation management and sediment removal, although mosquito abatement is a concern if the extended detention basin is designed to include permanent pools of standing water. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1.

Table 1
Routine Maintenance Activities for Extended Detention Basins

No.	Maintenance Task	Frequency of Task
1	Conduct annual vegetation management during the summer, removing weeds and harvesting vegetation. Remove all grass cuttings and other green waste.	Once a year
2	Trim vegetation at beginning and end of wet season to prevent establishment of woody vegetation, and for aesthetics and mosquito control.	Twice a year (spring and fall)
3	Evaluate health of vegetation and remove and replace any dead or dying plants. Remove all green waste and dispose of properly.	Twice a year
4	If turf grass is included in basin design, conduct regular mowing and remove all grass cuttings. Avoid producing ruts when mowing.	Every two along with regular landscape maintenance
5	Remove sediment from forebay when the sediment level reaches the level shown on the fixed vertical sediment marker and dispose of sediment properly.	As needed
6	Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of basin volume and dispose of sediment properly.	Every 10 years, or as needed [[to maintain 4 in. clearance below low-flow orifice]]
7	Remove accumulated trash and debris from the extended detention basin at the middle and end of the wet season and dispose of trash and debris properly.	Twice a year (January and April)
8	Irrigate during dry weather.	None. Drought tolerant vegetation is used.
9	Inspect extended detention basin using the attached inspection checklist.	Quarterly, or as needed

II. Prohibitions

The use of pesticides and quick release fertilizers shall be minimized, and the principles of integrated pest management (IPM) followed:

1. Employ non-chemical controls (biological, physical and cultural controls) before using chemicals to treat a pest problem.
2. Prune plants properly and at the appropriate time of year.
3. Provide adequate irrigation for landscape plants. Do not over water.
4. Limit fertilizer use unless soil testing indicates a deficiency. Slow-release or organic fertilizer is preferable. Check with municipality for specific requirements.
5. Pest control should avoid harming non-target organisms, or negatively affecting air and water quality and public health. Apply chemical controls only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, apply the least toxic and the least persistent pesticide that will provide adequate pest control. Do not apply pesticides on a prescheduled basis.
6. Sweep up spilled fertilizer and pesticides. Do not wash away or bury such spills.
7. Do not over apply pesticide. Spray only where the infestation exists. Follow the manufacturer's instructions for mixing and applying materials.
8. Only licensed, trained pesticide applicators shall apply pesticides.
9. Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging pesticides into runoff. With the exception of pre-emergent pesticides, avoid application if rain is expected.
10. Unwanted/unused pesticides shall be disposed as hazardous waste.

Standing water shall not remain in the treatment and/or hydromodification management measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the Alameda County Mosquito Abatement District (ACMAD), as needed for assistance. In Albany, contact the Alameda County Vector Control Services District (ACVCSD). Mosquito larvicides shall be applied only when absolutely necessary, as indicated by the ACMAD or ACVCSD, and then only by a licensed professional or contractor. Contact information for ACMAD and ACVCSD is provided below.

III. Vector Control Contacts

Northwest Riverside County (Riverside, Corona, Norco, Mira Loma, Glen Avon, Rubidoux, Highgrove, La Sierra areas)
Northwest Mosquito & Vector Control District
951.340.9792

Unincorporated areas of Riverside County
Vector Control at Riverside County Environmental Health
951.766.9454

City of Perris
Animal Control ask for Vector Control
951.657.4134

City of Moreno Valley
Partly city and partly Riverside County Environmental Health
951.413.3340 City of Moreno Valley Code Compliance Department
951.766.9454 Vector Control at County Environmental Health

Desert Hot Springs, Cathedral City, Palm Springs and East to Coachella
Vector Control
760.342.8287

City of Temecula
Code Enforcement
951.308.6383

City of Murrieta
Open spaces (parks, creeks, channels) Code Enforcement
951.304.7275
Pools, Code Enforcement
951.461.6630

City of Banning
Vector Control at Riverside County Environmental Health
951.766.9454

City of San Jacinto
Vector Control at Riverside County Environmental Health
951.766.9454

City of Hemet
Vector Control at Riverside County Environmental Health
951.766.9454

IV. Inspections

The attached Extended Detention Basin Inspection and Maintenance Checklist shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

Example of Extended Detention Basin
Inspection and Maintenance Checklist

Property Address: _____ Property Owner: _____

Treatment Measure No.: _____ Date of Inspection: _____ Type of Inspection: ▪ Monthly ▪ Pre-Wet Season ▪ After heavy runoff ▪ End of Wet Season ▪ Other:_____

Inspector(s): _____

Defect	**Conditions When Maintenance Is Needed**	**Maintenance Needed? (Y/N)**	**Comments** (Describe maintenance completed and if any needed maintenance was not conducted, note when it will be done.)	**Results Expected When Maintenance Is Performed**
General				
Trash & Debris	• Trash and debris accumulated in basin. • Visual evidence of dumping.			Trash and debris cleared from site and disposed of properly.
Poisonous Vegetation and noxious weeds	Poisonous or nuisance vegetation or noxious weeds, e.g., morning glory, English ivy, reed canary grass, Japanese knotweed, purple loosestrife, blackberry, Scotch broom, poison oak, stinging nettles, or devil's club.			Use Integrated Pest Management techniques to control noxious weeds or invasive species.
Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.			No contaminants or pollutants present.
Rodent Holes	If facility acts as a dam or berm, any evidence of rodent holes, or any evidence of water piping through dam or berm via rodent holes.			The design specifications are not compromised by holes. Any rodent control activities are in accordance with applicable laws and do not affect any protected species.
Insects	Insects such as wasps and hornets interfere with maintenance activities.			Insects do not interfere with maintenance activities.

Extended Detention Basin Inspection and Maintenance Checklist

Date of Inspection:_____

Property Address: _____

Treatment Measure No.:_____

Defect	**Conditions When Maintenance Is Needed**	**Maintenance Needed? (Y/N)**	**Comments** (Describe maintenance completed and if any needed maintenance was not conducted, note when it will be done.)	**Results Expected When Maintenance Is Performed**
Tree/Brush Growth and Hazard Trees	• Growth does not allow maintenance access or interferes with maintenance activity. • Dead, diseased, or dying trees.			• Trees do not hinder maintenance activities. • Remove hazard trees as approved by the City. (Use a certified Arborist to determine health of tree or removal requirements).
Drainage time	Standing water remains in basin more than five days.			Correct any circumstances that restrict the flow of water from the system. Restore drainage to design condition. If the problem cannot be corrected and problems with standing water recur, then mosquitoes should be controlled with larvicides, applied by a licensed pesticide applicator.
Outfall structure	Debris or silt build-up obstructs an outfall structure.			Remove debris and/or silt build-up and dispose of properly.
Side Slopes				
Erosion	• Eroded over 2 in. deep where cause of damage is still present or where there is potential for continued erosion. • Any erosion on a compacted berm embankment.			Cause of erosion is managed appropriately. Side slopes or berm are restored to design specifications, as needed.
Storage Area				
Sediment	Accumulated sediment >10% of designed basin depth or affects inletting or outletting condition of the facility.			Sediment cleaned out to designed basin shape and depth; basin reseeded if necessary to control erosion. Sediment disposed of properly.
Liner (If Applicable)	Liner is visible and has more than three 1/4-inch holes in it.			Liner repaired or replaced. Liner is fully covered.
Emergency Overflow/ Spillway and Berms				
Settlement	Berm settlement 4 inches lower than the design elevation.			Dike is built back to the design elevation.

Date of Inspection:_____
Treatment Measure No.:_____

Defect	**Conditions When Maintenance Is Needed**	**Maintenance Needed? (Y/N)**	**Comments** (Describe maintenance completed and if any needed maintenance was not conducted, note when it will be done.)	**Results Expected When Maintenance Is Performed**
Tree Growth	Tree growth on berms or emergency spillway >4 ft in height or covering more than 10% of spillway.			• Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. • A civil engineer should be consulted for proper berm/spillway restoration.
Emergency Overflow/ Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.			Rocks and pad depth are restored to design standards.
Debris Barriers (e.g., Trash Racks)				
Trash and Debris	Trash or debris is plugging openings in the barrier.			Trash or debris is removed and disposed of properly.
Damaged/ Missing Bars	Bars are missing, loose, bent out of shape, or deteriorating due to excessive rust.			Bars are repaired or replaced to allow proper functioning of trash rack.
Inlet/Outlet Pipe	Debris barrier is missing or not attached to pipe.			Debris barrier is repaired or replaced to allow proper functioning of trash rack.
Fencing and Gates				
Missing or broken parts	Any defect in or damage to the fence or gate that permits easy entry to a facility.			Fencing and gate are restored to design specifications.
Deteriorating Paint or Protective Coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.			Paint or protective coating is sufficient to protect structural adequacy of fence or gate.
Risers, orifices and screens	Any debris or clogging			Restore unobstructed flow through discharge structure; to meet original design; dispose of debris properly.
Miscellaneous				
Miscellan-ous	Any condition not covered above that needs attention to restore extended detention basin to design conditions.			Meets the design specifications.

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

This Appendix will be completed and addressed during the Final WQMP Submittal.