

STORMWATER MITIGATION COOPERATIVE AGREEMENT

This AGREEMENT, executed on and effective from (date), is between the State of California, acting through its Department of Transportation, referred to as CALTRANS, and:

CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER, a municipal agency, referred to hereinafter as LADWP.

CALTRANS and LADWP are individually referred to as PARTY and collectively referred to as PARTIES.

RECITALS

1. CALTRANS and LADWP, are authorized to enter into a Cooperative Agreement for Stormwater Mitigation hereinafter referred to as AGREEMENT pursuant to California Streets and Highways Code Section 126.1.
2. The Federal Clean Water Act requires a National Pollutant Discharge Elimination System (NPDES) permit for pollutants discharged into waters of the United States. The United States Environmental Protection Agency (USEPA) delegates this authority to state water agencies. The California State Water Resources Control Board (CSWRCB) issued NPDES Permit No. CAS000003 to CALTRANS. Section 303(d) of the Federal Clean Water Act (CWA) requires the State of California to establish a priority ranking for impaired waters, referred to as the 303(d) list. The United States Environmental Protection Agency (USEPA) has oversight authority for the 303(d) list. The USEPA approves the State's 303(d) list.
3. CALTRANS must comply with the Statewide NPDES Permit (Order # 2022-0033-DWQ effective January 1, 2023), and associated Time Schedule Order (TSO) Number 2022-0089-DWQ.
4. As per the Attachment D and E of the CALTRANS NPDES Order 2022-0033-DWQ Section D5.1 and E3, CALTRANS and LADWP may collaboratively implement the NPDES Permit requirements as they have been identified as stakeholders in the Total Maximum Daily Load (TMDL) or contain Significant Trash Generating Areas (STGA) for a Stormwater Improvement Project (hereinafter referred to as 'PROJECT') located at Valley Plaza Park North in the County of Los Angeles.
5. LADWP and City of Los Angeles Department of Public Works, Bureau of Engineering are pursuing the Stormwater Capture Parks Program to divert and capture stormwater runoff and improve water quality. This Program has nine projects located in the San Fernando Valley, including the Valley Plaza Park North Project (PROJECT), which is near State Route 170. The PROJECT will service 882.7 acres of drainage area, which includes 54.2 CALTRANS acres.

6. The PROJECT will address some of CALTRANS' obligations under Order 2022-0033-DWQ, including TMDL requirements (D.5) and STGA requirements (E3).
7. LADWP intends to design and construct the PROJECT and will be responsible for all management, maintenance and operations, including costs of the constructed PROJECT.
8. The PROJECT will receive flows from a total tributary area of 882.7 acres which includes runoff from CALTRANS roadways and impervious surfaces. Out of 882.7 acres of PROJECT, 49.1 acres are from CALTRANS impervious surfaces.
9. CALTRANS will contribute an amount, not to exceed, \$22,747,000 to LADWP for PROJECT to satisfy in part of its NPDES requirements.
10. CALTRANS will receive proportional credits to the contribution amount (56.82%) towards the dry and wet weather TMDL pollutant loads reduced by this PROJECT, 523.2 acres treated for pollutants and 0 acres of STGA treated. The final analyses prepared by the LADWP and their consultants has documented these load reductions in a memorandum from Tetra Tech dated 02/16/2023 (See attachment A). The load reductions shown in the memorandum are preliminary and subject to change in the assumptions used in the Consultant analysis. Waste Load reductions claimed by CALTRANS may change due to PROJECT operation and maintenance outcomes. The GIS mapping provided by LADWP has documented LADWP's 0 acres of STGA and CALTRANS' 0 acres of STGA.
11. PARTIES intend to define herein the terms and conditions under which PROJECT will proceed.
12. CALTRANS share of PROJECT funding is as follows:

<u>FUND TITLE</u>	<u>FUND SOURCE</u>	<u>DOLLAR AMOUNT</u>
SHOPP	STATE	\$22,747,000

SECTION I

CALTRANS AGREES:

1. To reimburse LADWP within forty-five (45) calendar days of receipt of a signed invoice for actual PROJECT costs incurred and paid.
2. The total financial obligation provided by CALTRANS for PROJECT shall not exceed the amount of \$22,747,000.
3. To provide encroachment permits to LADWP and its consultants and contractor for access to CALTRANS right-of-way, if necessary, to fulfil PROJECT requirements.
4. To review and provide comments to LADWP for the 60% complete plan set and 95% complete plan set and specifications for PROJECT within fifteen (15) working days of receipt.
5. To provide quality management work for all portions of PROJECT that resides within CALTRANS right-of-way.

SECTION II

LADWP AGREES:

1. To prepare, sign and submit monthly billing statements in arrears (invoices) to CALTRANS for actual PROJECT costs incurred and paid by LADWP.
2. All work performed by LADWP, or performed on behalf of LADWP, shall be performed in accordance with state, federal and local laws, regulations, and standards.
3. To be fully responsible for completing the environmental clearance, design, right-of-way requirements, and construction of PROJECT.
4. To obtain all necessary property rights (easements, rights of entry, fee, etc.) required to complete and maintain PROJECT. Said rights of entry shall also include rights for CALTRANS and resource agency personnel to monitor PROJECT for a period of five (5) years.
5. To obtain all environmental approvals and resource agency agreements and permits, including California Environmental Quality Act (CEQA) documents and approvals and National Environmental Policy Act (NEPA) documents and approvals, and all Los Angeles Regional Water Quality Control Board permits for PROJECT prior to the commencement of construction.
6. To fully comply with all the terms and conditions expressed in the environmental approvals, agreements and permits.

7. To prepare, or cause to prepare, a complete set of design plans, specifications, and estimate, TMDL waste (or pollutant) reduction calculation and report, and any other necessary technical documents, sufficient to advertise and award a construction contract for PROJECT. All documents shall be signed and sealed by an engineer duly registered in the State of California.
8. To provide CALTRANS with the 60% complete plan set and 95% complete plan set and specifications for PROJECT so that CALTRANS can review and provide comments within twenty (20) working days of receipt.
9. To incorporate or resolve all comments submitted by CALTRANS on the 60% complete plan set and 95% complete plan set and specifications for PROJECT.
10. To provide CALTRANS with copies of the final plans, specifications, and estimate; applicable environmental approvals, agreements and permits; right-of-way clearances, hereinafter referred to as PS&E package, prior to advertising the contract for construction.
11. To prepare contract documents, advertise and award a construction contract in accordance with LADWP acquisition processes.
12. To manage all aspects of PROJECT.
13. To be responsible for all management, maintenance and operations, including costs of the constructed PROJECT.
14. To provide annual documentation of PROJECT progress to CALTRANS for the Stormwater compliance files.
15. To prepare and submit a final accounting for all PROJECT costs. Based on the final accounting, CALTRANS will refund or invoice as necessary to satisfy the financial commitments of this AGREEMENT.
16. To conform with the provisions of Labor Code section 1720-1815, and all applicable provisions of the California Code of Regulations found in Title 8, Chapter 8, subchapter 3, articles 1-7 where Labor Code section 1720(a)(1) definition of “public works” includes construction, alteration, demolition, installation, repair or maintenance work under Labor Code section 1771.
17. To include prevailing wage requirements in its contracts for public work. Work performed by LADWP’s own forces is exempt from the Labor Code’s prevailing wage requirements.
18. To require the contractors to include prevailing wage requirements in all subcontracts funded by this AGREEMENT when the work to be performed falls within Labor Code sections

1729(a)(1) definition of “public works” under Labor Code section 1771. Subcontractors shall include all prevailing wage requirements set forth in LADWP’s contracts.

19. If work performed under this AGREEMENT is paid for in whole or in part with federal funds and is the type of work subject to federal prevailing wage requirements, LADWP must conform to the provisions of the Davis-Bacon and related acts, 40 U.S.C. 1341 et seq. in addition to Labor Code provisions.
20. To include federal prevailing wage requirements in its contracts for public work. Work performed by LADWP’s own forces is exempt from federal prevailing wage requirements.
21. To retain all books, documents, papers, accounting records, and other evidence pertaining to costs incurred, including support data for cost proposals, and to make such materials available to CALTRANS at all reasonable times for three (3) years after completion and acceptance of PROJECT. CALTRANS, the Federal Highway Administration, or any duly authorized representative of the Federal Government shall have access to any books, records, and documents of LADWP that pertain to this AGREEMENT for audits, examinations, excerpts, transactions, and copies thereof shall be furnished when requested.
22. To maintain and operate the PROJECT.
23. To provide an annual inspection, and maintenance reports to CALTRANS.

SECTION III

IT IS MUTUALLY AGREED:

1. All portions of this AGREEMENT, including the Recitals section, are enforceable.
2. If any provision of this AGREEMENT is held invalid, the other provisions shall not be affected thereby.
3. All CALTRANS’ obligations and commitments under the terms of this AGREEMENT are subject to the appropriation of resources by the Legislature, State Budget Act authority, and programming and allocation of funds by the California Transportation Commission (CTC).
4. Notwithstanding the terms of this AGREEMENT, PARTIES agree to abide by the funding guidelines for all contributed funds that are programmed and allocated by the CTC.
5. All applicable laws, regulations, rules, and policies relating to the use of federal or state funds shall apply notwithstanding other provisions of this AGREEMENT.
6. If LADWP fails to complete the PROJECT for any reason, LADWP will refund the full amount of CALTRANS’ contribution.

7. LADWP will retain all PROJECT related records for three (3) years after the final voucher.
8. LADWP will accept operation, maintenance and ownership or title to all materials or equipment installed as part of PROJECT.
9. CALTRANS has a total of fifteen (15) working days to perform review and return comments to LADWP for each review cycle (60% plans complete and 95% plans and specifications complete).
10. LADWP will defend, indemnify, and save harmless CALTRANS and all of its officers and employees from all claims, suits, or actions of every name, kind and description brought forth under, including, but not limited to, environmental, tortuous, contractual, inverse condemnation, or other theories or assertions of liability occurring by reason of the operation and maintenance of PROJECT.
11. HM-1 is hazardous materials (including, but not limited to, hazardous waste) that may require removal and disposal pursuant to federal or state law, whether it is disturbed by PROJECT or not.
12. HM-2 is hazardous materials (including but not limited to, hazardous waste) that may require removal and disposal pursuant to federal or state law only if disturbed by PROJECT.
13. The management activities related to HM-1 and HM-2, including and without limitation, any necessary manifest requirements and disposal facility designations are referred to herein as HM-1 MANAGEMENT and HM-2 MANAGEMENT respectively.
14. If HM-1 or HM-2 is found, the discovering PARTY will immediately notify the other PARTY.
15. CALTRANS, independent of the PROJECT is responsible for any HM-1 found within the existing state highway system right-of-way. CALTRANS will undertake, or cause to be undertaken, HM-1 MANAGEMENT with minimum impact to the PROJECT schedule.

CALTRANS will pay the cost of HM-1 MANAGEMENT for HM-1 found within the existing state highway system right-of-way with funds that are independent of the funds obligated in this AGREEMENT.
16. LADWP is responsible for HM-2 MANAGEMENT for PROJECT and shall be paid from funds obligated in this AGREEMENT.
17. CALTRANS' acquisition or acceptance of title to any property on which any HM-1 or HM-2 is found will proceed in accordance with CALTRANS' policy on such acquisition.
18. LADWP is responsible for any HM-1 found within the PROJECT limits and outside the existing State Highway System right-of-way. LADWP will undertake, or cause to be

undertaken, HM-1 MANAGEMENT with minimum impact to the CALTRANS PROJECT schedule.

LADWP will pay, or cause to be paid, the cost of HM-1 MANAGEMENT for HM-1 found within the PROJECT limits and outside of the existing State Highway System right-of-way with funds that are independent of the funds obligated in this AGREEMENT.

19. Neither CALTRANS nor any officer or employee thereof is responsible for any injury, damage, or liability occurring by reason of anything done or omitted to be done by LADWP, its contractors, sub-contractors and/or its agents under or in connection with any work, authority, or jurisdiction conferred upon LADWP or under this AGREEMENT. It is understood and agreed that LADWP, to the extent permitted by law, will defend, indemnify, and save harmless CALTRANS and all of its officers and employees from all claims, suits, or actions of every name, kind and description brought forth under, but not limited to, tortious, contractual, inverse condemnation, or other theories or assertions of liability occurring by reason of anything done or omitted to be done by LADWP, its contractors, sub-contractors and/or its agents under this AGREEMENT.
20. Neither LADWP nor any officer or employee thereof is responsible for any injury, damage, or liability occurring by reason of anything done or omitted to be done by CALTRANS, its contractors, sub-contractors and/or its agents under or in connection with any work, authority, or jurisdiction conferred upon CALTRANS or under this AGREEMENT. It is understood and agreed that CALTRANS, to the extent permitted by law, will defend, indemnify, and save harmless LADWP and all of its officers and employees from all claims, suits, or actions of every name, kind and description brought forth under, but not limited to, tortious, contractual, inverse condemnation, or other theories or assertions of liability occurring by reason of anything done or omitted to be done by CALTRANS, its contractors, sub-contractors and/or its agents under this AGREEMENT.
21. This AGREEMENT will terminate upon execution of a Cooperative Agreement Closure Statement (CLOSURE STATEMENT) by PARTIES. The CLOSURE STATEMENT is a document that verifies all commitments of this AGREEMENT have been met and PROJECT is fully complete.

However, all indemnification, document retention, audit, claims, environmental commitment, legal challenge, hazardous material, operation, maintenance, and ownership articles will remain in effect until terminated or modified in writing by mutual agreement.

CONTACT INFORMATION

The information provided below indicates the primary contact information for each PARTY to this AGREEMENT. PARTIES will notify each other in writing of any personnel or location changes. Contact information changes do not require an amendment to this AGREEMENT.

LOS ANGELES DEPARTMENT OF WATER AND POWER

Project Manager: Art Castro

Phone Number: (213) 367-2966

E-mail: Art.Castro@ladwp.com

Billing Address: 111 N Hope St, Room 314, Los Angeles, CA, 90012

CALTRANS

Project Manager: Neil Liang

Phone Number: (213) 266-6554

E-mail: neil.liang@dot.ca.gov

Billing Address: 100 S. Main St, Los Angeles, CA, 90012

SIGNATURES

PARTIES are authorized to enter into this AGREEMENT and have delegated to the undersigned the authority to execute this AGREEMENT on behalf of the respective agencies and covenants to have followed all the necessary legal requirements to validly execute this AGREEMENT.

The PARTIES acknowledge that executed copies of this AGREEMENT may be exchanged by facsimile or email, and that such copies shall be deemed to be effective as originals.

**STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

**DEPARTMENT OF WATER AND
POWER OF THE CITY OF LOS
ANGELES BY BOARD OF WATER AND
POWER COMMISSIONERS**

By: _____
For Gloria Roberts
D7 District Director

By: _____
Janisse Quiñones
Chief Executive Officer and Chief Engineer

VERIFIED OF FUNDS & AUTHORITY:


By: _____
District Budget Manager

And: _____
Chante L. Mitchell
Board Secretary

By: _____
[TBA]
Attorney
Department of Transportation

APPROVED AS TO FORM & LEGALITY:

CERTIFIED AS TO FINANCIAL TERMS &
POLICIES:

By:  9-20-2024
John A. Carvalho
Deputy City Attorney

By: _____
Darwin Salmos
HQ Accounting Supervisor

Attachment A – Tetra Tech Memo



MEMO

To: Noel Le, Peter Tonthat, Ryan Aghakhani, Bryan Powell, Eduardo Hernandez, Winkit Wichianchan, Elena Lopez (City of Los Angeles)

From: Jason Wright, Michela Catena, Elva Pangilinan, and Jason Fussel (Tetra Tech)

Date: February 16, 2023

Subject: Task Order Solicitation (TOS) No. 25: Los Angeles Parks Stormwater Capture Project – Waste Load Allocation (WLA) Analysis Technical Memorandum for Valley Plaza Park North (FINAL)

1.0 Introduction

The Los Angeles Department of Water and Power (LADWP) and the Los Angeles Department of Public Works Bureau of Engineering (BOE) are committed to pursuing the Stormwater Capture Parks Program (Program). The goal of the Program is to alleviate local flooding, increase water supplies through stormwater capture, improve water quality, and provide recreational, social, and economic benefits. The Program will incorporate innovative techniques and emerging technologies to capture and infiltrate stormwater.

The Program aspires to capture up to 2,912 acre-feet per year (AFY) of stormwater and urban runoff from a 5,686-acre drainage area and divert the runoff into subterranean infiltration galleries or other stormwater capture and infiltration infrastructure located under the City of Los Angeles (City) parks for infiltration into the underlying groundwater basin. The Program consists of nine (9) Projects located in the San Fernando Valley in Council Districts 2, 6, and 7 - David M. Gonzales, Fernangeles, Strathern, Whitsett, Valley Plaza North, Valley Plaza South, Alexandria, Valley Village, and North Hollywood. The locations of the parks and the approximate locations of the respective proposed infiltration projects are shown in Figure 1.

The City has contracted separately with 3 consultant teams to develop Preliminary Engineering Designs for infiltration projects for each of the 9 parks. This programmatic analysis, complementary to the individual park projects, simultaneously optimizes the gallery sizes and diversion rates for all 9 parks with the objective of meeting or exceeding the target stormwater capture volume of 2,912 AFY. The programmatic analysis consists of using runoff and pollutant load timeseries data from the Los Angeles County's Watershed Management Modeling System (WMMS 1.0) as boundary conditions in USEPA's System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN) optimization framework. Three configurations were recommended based on the programmatic analysis. The water quality loads associated with the CALTRANS and non-CALTRANS land uses for the Valley Plaza Park North for the baseline and project conditions (for configuration #1 or highest preference option) are summarized in Table 2 below for a 10-year evaluation period (from 10/1/2002 to 9/30/2011). The proposed configuration for the Valley Plaza Park North Stormwater Capture project diverts stormwater from the Central Branch Tujunga Wash into a pretreatment device (a baffle box hydrodynamic separator) by means of an RCB diversion and a pump station. The pretreated water then flows into an underground infiltration gallery, totaling 22 ac-ft of storage, where it will infiltrate into the underlying soils reducing the flow into the Upper Los Angeles River. The infiltration galleries were designed using an infiltration rate of 2.2 in/hr.

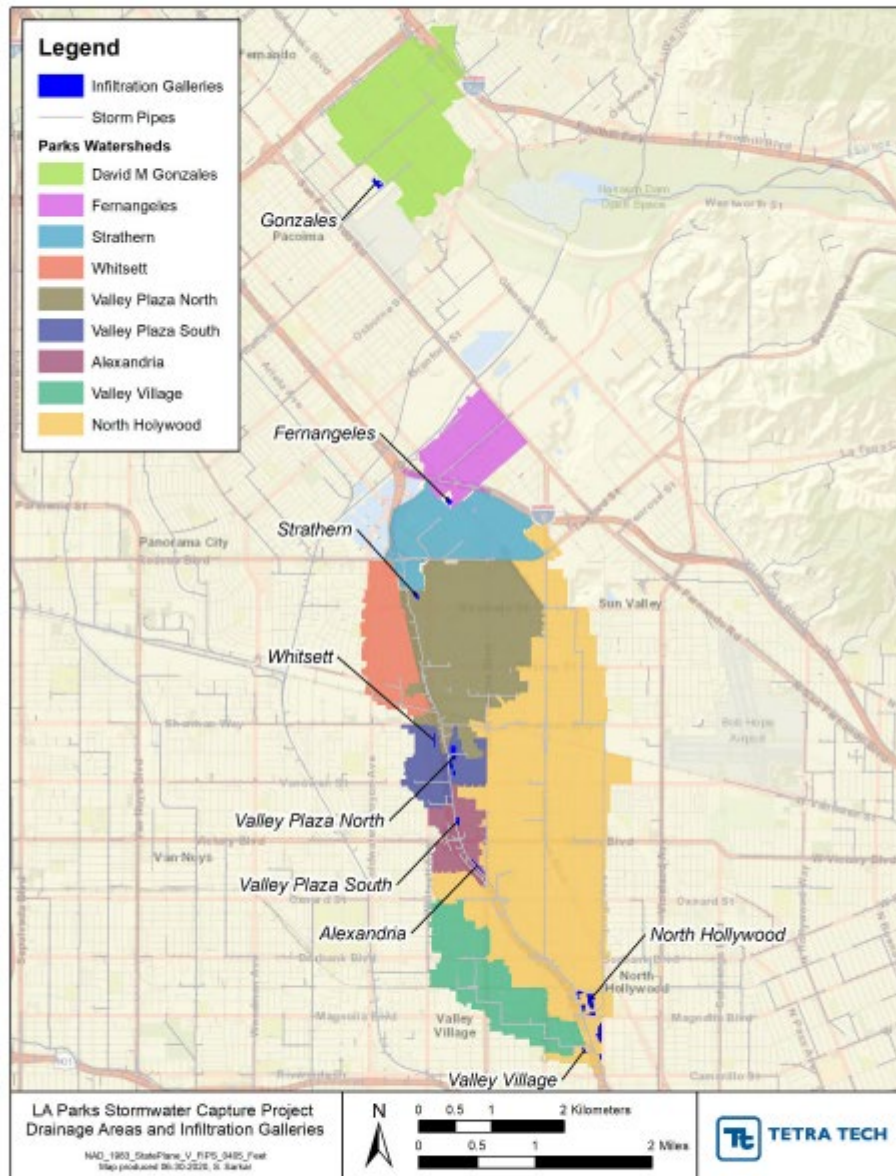


Figure 1. Program park locations and drainage areas.

2.0 Watershed Hydrology and Water Quality

2.1 Baseline Conditions

The Los Angeles County's WMMS 1.0 formed the basis for the land use and runoff and pollutant load timeseries in the optimization model. WMMS incorporates the Loading Simulation Program C++ (LSPC) simulation model to establish runoff volume, and sediment, nutrient, metals, and bacteria loads for the Los Angeles County watersheds. The drainage areas by landuse associated with the Valley Plaza Park North are summarized in Table 1 (based on the WMMS model). Land use characteristics, including total, pervious, and impervious, were determined and calculated using the hydrologic response units established in the WMMS model. The methods and procedures are outlined in the Los Angeles County Watershed Model Configuration and Calibration—Part I: Hydrology (LACDPW 2010).

The average annual long-term and 85th-percentile runoff, sediment, nutrients, metals, and bacteria loading for the Valley Plaza Park North watershed are summarized in Table 2. Surface runoff and interflow/groundwater flow are 67% and 33%, respectively, of the simulated average annual total runoff (values obtained from Table 5). Note however that WMMS 1.0 does not simulate cadmium, nitrate-nitrogen and trash. The sources used to determine concentrations and loads by landuse for cadmium, nitrate-nitrogen and trash are noted below Table 2.

Table 1. Land use characteristics of the contributing drainage area for Valley Plaza Park North.

Land Use Classification	Total Area (acres)	Pervious Area (acres)	Impervious Area (acres)
Single-Family Residential (High-Density)	384.8	233.7	151.2
Single-Family Residential (Low-Density)	12.6	11.3	1.3
Multi-Family Residential	57.9	24.2	33.7
Commercial	30.6	3.5	27.0
Institutional	10.8	1.9	8.8
Industrial	122.6	35.4	87.2
CALTRANS (Transportation)	54.2	5.0	49.1
Secondary Roads	193.6	98.3	95.4
Vacant	3.1	3.1	0.0
Agriculture	12.5	12.5	0.0
Total	882.7	429.1	453.7

Table 2. WMMS simulated average annual long-term and 85th-percentile 24-hour storm runoff, sediment, nutrients, metals, bacteria and trash loads for Valley Plaza Park North drainage area.

Constituent	Long-Term (10/1/2002 to 9/30/2011)			85th-percentile 24-hour Storm		
	Unit	CALTRANS	non-CALTRANS	Unit	CALTRANS	non-CALTRANS
Precipitation	in/yr	13.73		in	1.11	
Runoff	ac-ft/d	0.14500	1.85140	ac-ft	4.16	58.82
TSS	lbs/d	25.44567	188.12204	lbs	901.15	20,896.14
TN	lbs/d	0.75045	6.89894	lbs	29.71	613.85
NO ₃	lbs/d	0.21687	1.71480	lbs	8.48	177.25
TP	lbs/d	0.37574	5.34383	lbs	7.57	73.22
Cu	lbs/d	0.01071	0.07043	lbs	0.36	3.88
Pb	lbs/d	0.01070	0.06271	lbs	0.11	1.82
Zn	lbs/d	0.10031	0.67623	lbs	3.22	30.58
Cd	lbs/d	0.00067	0.00687	lbs	0.02	0.24
Fecal	MPN/d	1.76E+09	1.03E+11	MPN	2.07E+11	4.62E+14
Trash	lbs/d	1.72378	29.42406	lbs	1.72	29.41

Notes -

- Cadmium concentrations by landuse (including highways and interstates in the Transportation landuse) were based on the research of Ryan Edgley for the Los Angeles River watershed (Edgley, 2016).
- Nitrate-nitrogen loads by landuse were based on an analysis of the EMC data available in the Structural BMP Prioritization and Analysis Tool (SBPAT v1.0) User's Guide (Geosyntec Consultants, 2008).
- Trash loading by landuse were based on the loading rates available in the Los Angeles River Trash TMDL (California Regional Water Quality Control Board, 2007).
- Consistent with Los Angeles County's recommended procedures, runoff associated with 85th-percentile 24-hour storm for the Valley Plaza Park North drainage area was determined using the modified rational method and is the basis for the design of the infiltration galleries. The modified rational method however reports the total runoff opposed to the WMMS model that reports surface runoff, interflow, and groundwater flow. We therefore first simulated the 85th-percentile 24-hour storm using the WMMS model and subsequently used the WMMS reported proportions of surface runoff versus interflow/groundwater flow to separate out the total runoff estimated using the modified rational method to surface runoff and interflow/groundwater flow.
- The WMMS model guidance document suggests that while WMMS is appropriate for simulation of the 85th-percentile 24-hour storm, it is not suitable for simulation of water quality associated with the 85th-percentile 24-hour storm because it does not provide sufficient time for pollutant buildup. Therefore, we used EMCs for determination of water quality loads associated with the 85th-percentile 24-hour storm. Water quality loads associated with the 85th-percentile 24-hour storm are based on an analysis of EMC data available in the Structural BMP Prioritization and Analysis Tool (SBPAT v1.0) User's Guide. The EMCs by landuse used in this analysis are summarized in Appendix A.
- The 85th-percentile, 24-hour storm is less than a 1-year storm event for the region with an intensity of 0.045 in/hr. On an average annual basis, this equates to about 13.73 in/year.

2.2 Project Conditions

The USEPA's SUSTAIN model was used to estimate the magnitude of stormwater and water quality load capture by the infiltration gallery at Valley Plaza Park North. The load capture simulated by the infiltration gallery was uniformly applied to landuses in the drainage area of the Valley Plaza Park North. The average annual wet and dry weather baseline loads and reductions by CALTRANS and non-CALTRANS landuses for water years 2002 to 2011 are summarized in Table 3 and Table 4, respectively. Note that dry weather loads associated with CALTRANS are largely from the irrigated pervious fraction. The WMMS model assumes that 85% of the CALTRANS pervious area is irrigated (LACDPW 2010). However, note that the WMMS model has not been calibrated with CALTRANS data. Because CALTRANS and non-CALTRANS areas were modeled separately and loads were calculated for each HRU based on EMC data, the load reduction for the CALTRANS land use may be lower due to the lower volumes with higher intensity generated from the CALTRANS landuse. On an hourly timestep, the percent reductions for CALTRANS and non-CALTRANS flows are the same, but small discrepancies arise from calculating the average annual baseline and capture volumes. The average annual baseline loads and reductions for the same time-period by CALTRANS and non-CALTRANS landuses are summarized in Table 5. The baseline loads and reductions for the 85th-percentile 24-hour storm are summarized in Table 6. The 90th-percentile exceedance volume determined for this watershed based on the EWMP RAA is approximately 47.8 ac-ft occurring from 1/18/2010 12:00 to 1/19/2010 11:00. The rainfall magnitude associated with the 90th-percentile exceedance storm is 1.38 inches. The baseline loads and reductions associated with the 90th-percentile exceedance volume event are summarized in Table 7.

Table 3. Average annual wet weather volume, sediment, nutrients, metals, bacteria and trash baseline loads and reduction for Valley Plaza Park North.

Constituent	Unit	CALTRANS				non-CALTRANS			
		Total		Interflow/Groundwater		Total		Interflow/Groundwater	
		Baseline	Reduction	Baseline	Reduction	Baseline	Reduction	Baseline	Reduction
Volume	ac-ft/d	3.13205	0.90840	0.02958	0.01158	30.02294	8.50495	2.48543	0.96488
TSS	lbs/d	618.17035	207.66403	0	0	4634.47922	1422.48920	0	0
TN	lbs/d	16.93918	5.36076	0.06568	0.01580	155.32012	46.11478	5.55119	1.31825
NO ₃	lbs/d	4.89559	1.55251	0.01379	0.00332	38.61108	11.51687	1.29933	0.31175
TP	lbs/d	8.48123	2.67272	0.03547	0.00826	120.41035	36.35637	3.06674	0.70661
Cu	lbs/d	0.26017	0.08745	0	0	1.73434	0.53935	0	0
Pb	lbs/d	0.25995	0.08744	0	0	1.54375	0.48710	0	0
Zn	lbs/d	2.43671	0.82080	0	0	16.63806	5.27640	0	0
Cd	lbs/d	0.01490	0.00415	0	0	0.13521	0.03725	0	0
Fecal	MPN/d	3.96E+10	1.23E+10	5.21E+08	1.27E+08	2.31E+12	6.88E+11	8.48E+10	2.16E+10
Trash	lbs/d	1.72284	1.08302	0	0	29.40794	18.48661	0	0

Notes:

- Wet weather, for the purposes of the WLA analysis, is defined as when the rainfall is greater than 0.1 in/hr and 24-hours thereafter.
- Wet weather and dry weather loads are calculated by dividing the load by the average number of wet (14 days) and dry weather days (351 days), respectively.
- Total load is the sum of the surface and interflow/groundwater loads.

Table 4. Average annual dry weather volume, sediment, nutrients, metals, bacteria and trash baseline loads and capture for Valley Plaza Park North.

Constituent	Unit	CALTRANS				non-CALTRANS			
		Total		Interflow/Groundwater		Total		Interflow/Groundwater	
		Baseline	Reduction	Baseline	Reduction	Baseline	Reduction	Baseline	Reduction
Volume	ac-ft/d	0.02368	0.01982	0.00685	0.00673	0.70722	0.66641	0.56849	0.55855
TSS	lbs/d	1.37223	0.96873	0	0	7.53385	5.32543	0	0
TN	lbs/d	0.09294	0.07257	0.00138	0.00121	0.87084	0.68974	0.11633	0.10163
NO ₃	lbs/d	0.02684	0.02095	0.00029	0.00025	0.21626	0.17118	0.02735	0.02393
TP	lbs/d	0.04653	0.03633	0.00075	0.00065	0.67042	0.52833	0.06435	0.05597
Cu	lbs/d	0.00058	0.00041	0	0	0.00285	0.00201	0	0
Pb	lbs/d	0.00058	0.00041	0	0	0.00256	0.00181	0	0
Zn	lbs/d	0.00542	0.00383	0	0	0.02795	0.01977	0	0
Cd	lbs/d	0.00009	0.00007	0	0	0.00165	0.00145	0	0
Fecal	MPN/d	2.19E+08	1.71E+08	1.10E+07	9.63E+06	1.30E+10	1.03E+10	1.82E+09	1.61E+09
Trash	lbs/d	1.72382	1.70911	0	0	29.42471	29.17362	0	0

Notes:

- Wet weather and dry weather loads are calculated by dividing the load by the average number of wet (14 days) and dry weather days (351 days), respectively.
- Total load is the sum of the surface and interflow/Groundwater loads.

Table 5. Average annual runoff, sediment, nutrients, metals, bacteria and trash baseline loads and capture for Valley Plaza Park North.

Constituent	Unit	CALTRANS				non-CALTRANS			
		Total		Interflow/Groundwater		Total		Interflow/Groundwater	
		Baseline	Reduction	Baseline	Reduction	Baseline	Reduction	Baseline	Reduction
Volume	ac-ft/d	0.14500	0.05450	0.00774	0.00692	1.85140	0.97235	0.64330	0.57441
TSS	lbs/d	25.44567	9.03598	0	0	188.12204	60.63688	0	0
TN	lbs/d	0.75045	0.27897	0.00389	0.00178	6.89894	2.46267	0.32845	0.14911
NO ₃	lbs/d	0.21687	0.08072	0.00082	0.00037	1.71480	0.61400	0.07699	0.03516
TP	lbs/d	0.37574	0.13923	0.00210	0.00095	5.34383	1.92669	0.18153	0.08136
Cu	lbs/d	0.01071	0.00381	0	0	0.07043	0.02298	0	0
Pb	lbs/d	0.01070	0.00380	0	0	0.06271	0.02075	0	0
Zn	lbs/d	0.10031	0.03571	0	0	0.67623	0.22493	0	0
Cd	lbs/d	0.00067	0.00023	0	0	0.00687	0.00285	0	0
Fecal	MPN/d	1.76E+09	6.46E+08	3.09E+07	1.42E+07	1.03E+11	3.68E+10	5.06E+09	2.39E+09
Trash	lbs/d	1.72378	1.68468	0	0	29.42406	28.75651	0	0

Notes:

- Average annual loads are calculated by dividing the load by 365 days.
- Total load is the sum of the surface and interflow/groundwater loads.

Table 6. 85th-percentile 24-hour storm runoff, sediment, nutrients, metals, bacteria and trash baseline loads and capture for Valley Plaza Park North.

Constituent	Unit	CALTRANS				non-CALTRANS			
		Total		Interflow/Groundwater		Total		Interflow/Groundwater	
		Baseline	Reduction	Baseline	Reduction	Baseline	Reduction	Baseline	Reduction
Volume	ac-ft	4.16	1.43	0.16	0.06	58.82	20.23	17.78	6.12
TSS	lbs	901.15	310.00	0	0	20,896.14	7,188.27	0	0
TN	lbs	29.71	10.22	1.66	0.57	613.85	211.16	232.33	79.92
NO ₃	lbs	8.48	2.92	0.35	0.12	177.25	60.97	83.91	28.87
TP	lbs	7.57	2.60	0.18	0.06	73.22	25.19	23.27	8.01
Cu	lbs	0.36	0.12	0	0	3.88	1.33	0	0
Pb	lbs	0.11	0.04	0	0	1.82	0.63	0	0
Zn	lbs	3.22	1.11	0	0	30.58	10.52	0	0
Cd	lbs	0.02	0.01	0	0	0.24	0.08	0	0
Fecal	MPN	2.07E+11	7.13E+10	5.63E+08	1.94E+08	4.62E+14	1.59E+14	6.21E+10	2.14E+10
Trash	lbs	1.72	0.59	0	0	29.41	10.12	0	0

Notes:

- The Los Angeles County's WMMS 1.0 formed the basis for the landuse, and runoff and pollutant load timeseries in the optimization model to establish runoff volume, sediment, nutrients, metals and bacteria to determine the baseline. Reductions were estimated using the USEPA SUSTAIN model. Together, the modified rational method was used to calculate the volume, EMCs were used to estimate the load, and SUSTAIN was used to estimate reductions. The reductions were applied to the load to determine the load reductions for each pollutant.
- Total load is the sum of the surface and interflow/groundwater loads.

Table 7. 90th-percentile exceedance volume runoff, sediment, nutrients, metals, bacteria and trash baseline loads and capture for Valley Plaza Park North.

Constituent	Unit	CALTRANS				non-CALTRANS			
		Total		Interflow/Groundwater		Total		Interflow/Groundwater	
		Baseline	Reduction	Baseline	Reduction	Baseline	Reduction	Baseline	Reduction
Volume	ac-ft	5.40074	1.25756	0.01528	0.00380	45.72249	10.66412	1.25586	0.31205
TSS	lbs	2,459.35400	208.50381	0	0	18,516.86600	1,569.85825	0	0
TN	lbs	29.30143	6.67381	0.01137	0.00261	242.77347	55.29648	0.93164	0.21380
NO ₃	lbs	8.49584	1.93504	0.00239	0.00055	60.81946	13.85284	0.23264	0.05339
TP	lbs	14.66445	3.34228	0.00614	0.00140	194.76585	44.39054	0.52370	0.11938
Cu	lbs	1.03552	0.09005	0	0	6.92113	0.60190	0	0
Pb	lbs	1.03552	0.09182	0	0	6.17912	0.54790	0	0
Zn	lbs	9.70797	0.83592	0	0	68.18419	5.87110	0	0
Cd	lbs	0.02594	0.00224	0	0	0.22516	0.01952	0	0
Fecal	MPN	6.66E+10	1.50E+10	9.03E+07	2.09E+07	3.62E+12	8.17E+11	1.94E+10	4.50E+09
Trash	lbs	1.72284	0.42720	0	0	29.40794	7.29212	1.25586	0.31205

Notes:

- The Los Angeles County's WMMS 1.0 formed the basis for the landuse, and runoff and pollutant load timeseries in the optimization model to establish runoff volume, sediment, nutrients, metals, and bacteria to determine the baseline. Reductions were estimated using the USEPA SUSTAIN model.
- The 90th-percentile exceedance volume is determined based on the storm volumes that generate loads of copper or lead greater than their respective standards in the RAA (0.32 kg Cu and 0.12 kg Pb). The 85th-percentile event is the 24-hour period of rainfall that makes up the 85th-percentile of all rainfall events in the drainage area. This can cause a variation in the 90th-percentile storm versus the 85th-percentile storm loads presented here.
- Total load is the sum of the surface and interflow/groundwater loads.

The total number of simulated runoff and bypass events for the project condition are summarized in Table 8. A runoff event is defined as any time-period with rainfall at least 0.1 inches/hr and 24-hours thereafter.

Table 8. Runoff and bypass events for Valley Plaza Park North for water years 2003 to 2011.

Water Year	Number of Runoff Events	Number of Bypass Events
2002	8	7
2003	12	12
2004	11	11
2005	16	16
2006	16	16
2007	3	3
2008	8	8
2009	8	8
2010	11	11
2011	10	10

The bypass concentrations of Fecal coliform, total nitrogen (TN) and total phosphorus (TP) for each runoff event resulting in bypass for CALTRANS and non-CALTRANS landuses are summarized in Table 9.

Table 9. Bypass concentrations of Fecal, TN and TP for runoff events resulting in bypass.

Event Date	CALTRANS				non-CALTRANS			
	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)
11/11/2001 03:00 to 11/12/2001 08:00	13.01	6.4	0.01	0.01	109.78	40.7	0.01	0.01
11/22/2001 21:00 to 11/23/2001 22:00	19.69	1013.2	2.02	1.01	162.63	6600.4	2.01	1.62
12/18/2001 21:00 to 12/19/2001 21:00	3.47	1101.3	2.20	1.10	28.73	7155.3	2.19	1.76
12/27/2001 21:00 to 12/28/2001 21:00	1.91	0.0	0.00	0.00	15.86	0.0	0.00	0.00
01/25/2002 21:00 to 01/26/2002 21:00	13.75	1016.0	2.02	1.01	113.54	6620.1	2.01	1.62
02/15/2002 21:00 to 02/16/2002 21:00	0.68	0.0	0.00	0.00	5.68	0.0	0.00	0.00
05/19/2002 07:00 to 05/20/2002 07:00	0.65	0.0	0.00	0.00	5.86	0.0	0.00	0.00
11/07/2002 02:00 to 11/08/2002 02:00	55.24	18.0	0.04	0.02	459.10	116.3	0.04	0.03
11/28/2002 21:00 to 11/29/2002 21:00	2.15	1057.2	2.11	1.06	17.90	6815.0	2.09	1.68
12/15/2002 02:00 to 12/16/2002 03:00	62.92	1016.1	2.03	1.02	523.87	6572.2	2.01	1.62

Event Date	CALTRANS				non-CALTRANS			
	Volume (ac-in)	Fecal (MPW/100 mL)	TN (mg/L)	TP (mg/L)	Volume (ac-in)	Fecal (MPW/100 mL)	TN (mg/L)	TP (mg/L)
12/17/2002 15:00 to 12/18/2002 15:00	1.10	1018.1	2.04	1.02	11.95	5065.5	1.55	1.24
12/18/2002 21:00 to 12/19/2002 22:00	21.03	1020.4	2.02	1.01	177.00	6689.1	2.02	1.61
02/09/2003 21:00 to 02/10/2003 21:00	11.62	1021.3	2.03	1.02	95.99	6648.8	2.02	1.63
02/11/2003 02:00 to 02/12/2003 06:00	233.51	1083.3	2.01	1.01	2483.54	6699.9	1.99	1.48
02/22/2003 21:00 to 02/23/2003 21:00	6.30	1077.3	2.14	1.07	52.49	6955.0	2.12	1.70
03/13/2003 20:00 to 03/14/2003 23:00	65.40	1017.9	2.02	1.01	561.21	6519.3	1.98	1.58
04/12/2003 03:00 to 04/13/2003 03:00	0.01	0.0	0.00	0.00	0.90	0.0	0.00	0.00
04/13/2003 23:00 to 04/15/2003 05:00	46.60	1019.4	2.03	1.02	394.54	6485.2	1.98	1.59
05/01/2003 21:00 to 05/02/2003 22:00	22.63	1021.6	2.03	1.02	187.20	6643.7	2.02	1.63
10/29/2003 21:00 to 10/30/2003 21:00	9.30	1041.8	2.07	1.04	77.09	6759.3	2.06	1.65
10/31/2003 05:00 to 11/01/2003 05:00	8.16	1049.6	2.10	1.05	71.67	6428.0	1.97	1.58
12/21/2003 09:00 to 12/22/2003 10:00	16.06	1048.6	2.10	1.05	134.31	6743.6	2.06	1.66
12/23/2003 13:00 to 12/24/2003 18:00	16.38	64.3	0.13	0.06	136.37	415.7	0.13	0.10
12/31/2003 21:00 to 01/01/2004 21:00	3.51	1084.7	2.17	1.08	29.05	7044.3	2.15	1.73
01/31/2004 21:00 to 02/01/2004 21:00	1.73	0.0	0.00	0.00	14.36	0.0	0.00	0.00
02/16/2004 21:00 to 02/17/2004 21:00	3.53	1077.4	2.15	1.08	29.18	7004.8	2.14	1.72
02/19/2004 21:00 to 02/21/2004 15:00	43.96	128.9	0.26	0.13	365.41	834.0	0.25	0.20
02/23/2004 21:00 to 02/25/2004 22:00	61.19	1030.6	2.03	1.02	536.57	6613.9	1.98	1.57
02/28/2004 21:00 to 02/29/2004 21:00	7.39	1076.1	2.15	1.08	61.85	6948.9	2.13	1.71
03/30/2004 21:00 to 03/31/2004 21:00	5.90	1055.3	2.10	1.05	49.04	6827.5	2.08	1.67
10/15/2004 21:00 to 10/16/2004 21:00	9.33	1040.3	2.07	1.04	77.33	6751.1	2.06	1.65
10/17/2004 09:00 to 10/19/2004 15:00	75.23	997.5	1.99	1.00	643.65	6417.8	1.94	1.55
10/24/2004 21:00 to 10/25/2004 22:00	36.54	1024.2	2.03	1.01	311.78	6665.6	2.02	1.60

Event Date	CALTRANS				non-CALTRANS			
	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)
10/26/2004 05:00 to 10/27/2004 05:00	33.21	1082.0	2.06	1.04	341.20	6684.6	1.96	1.50
12/03/2004 21:00 to 12/04/2004 21:00	2.42	1100.8	2.20	1.10	20.13	7107.9	2.18	1.75
12/25/2004 21:00 to 12/26/2004 21:00	13.07	1024.0	2.04	1.02	108.09	6662.8	2.03	1.63
12/27/2004 04:00 to 12/30/2004 14:00	219.81	1064.8	2.01	1.01	2254.72	6540.8	1.96	1.49
12/31/2004 09:00 to 01/02/2005 09:00	79.47	1105.0	2.06	1.04	880.01	6453.3	1.97	1.47
01/05/2005 21:00 to 01/06/2005 22:00	40.82	1080.8	2.05	1.02	412.03	6549.7	2.00	1.51
01/07/2005 05:00 to 01/10/2005 08:00	306.33	1087.4	1.99	1.00	3595.68	6062.2	1.88	1.38
02/16/2005 21:00 to 02/21/2005 11:00	389.68	1106.0	2.00	1.01	4641.30	6205.2	1.93	1.40
02/21/2005 18:00 to 02/22/2005 18:00	16.11	1204.2	2.26	1.20	202.60	6054.0	1.89	1.49
03/04/2005 04:00 to 03/05/2005 05:00	26.55	1041.4	2.06	1.04	234.99	6470.7	1.98	1.58
03/21/2005 21:00 to 03/22/2005 22:00	28.43	1017.8	2.03	1.01	235.61	6613.9	2.02	1.62
04/26/2005 21:00 to 04/27/2005 21:00	12.65	1042.5	2.07	1.04	104.96	6760.5	2.06	1.55
05/05/2005 06:00 to 05/06/2005 07:00	2.56	1110.2	2.22	1.11	23.11	6622.6	2.03	1.63
10/17/2005 01:00 to 10/18/2005 07:00	65.09	1010.3	2.02	1.01	548.35	6495.1	1.98	1.59
11/09/2005 07:00 to 11/10/2005 07:00	11.29	1015.5	2.03	1.02	96.75	6373.1	1.95	1.57
12/31/2005 08:00 to 01/01/2006 14:00	90.70	650.7	1.28	0.64	768.37	4252.3	1.27	1.01
01/01/2006 23:00 to 01/02/2006 23:00	15.74	1025.4	2.07	1.04	131.79	6724.5	2.07	1.66
01/14/2006 08:00 to 01/15/2006 08:00	2.43	999.1	2.00	1.00	21.69	6034.3	1.85	1.48
02/16/2006 21:00 to 02/17/2006 21:00	3.99	1118.2	2.24	1.12	33.69	7131.3	2.18	1.75
02/26/2006 20:00 to 02/27/2006 23:00	50.91	1006.9	2.01	1.00	422.02	6548.7	2.00	1.61
03/01/2006 21:00 to 03/02/2006 21:00	5.06	1076.5	2.15	1.08	42.17	6955.6	2.13	1.71
03/03/2006 06:00 to 03/04/2006 07:00	3.98	1038.2	2.08	1.04	35.43	6334.7	1.93	1.55
03/10/2006 22:00 to 03/11/2006 22:00	2.71	1108.9	2.22	1.11	22.55	7174.9	2.20	1.76

Event Date	CALTRANS				non-CALTRANS			
	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)
03/19/2006 23:00 to 03/20/2006 23:00	10.85	0.0	0.00	0.00	89.51	0.0	0.00	0.00
03/28/2006 01:00 to 03/29/2006 08:00	38.45	1024.6	2.04	1.02	324.53	6540.1	1.99	1.60
03/30/2006 21:00 to 03/31/2006 21:00	3.91	1098.1	2.20	1.10	32.69	7071.1	2.16	1.74
04/04/2006 05:00 to 04/05/2006 08:00	99.51	1067.3	2.01	1.01	1010.10	6676.4	1.99	1.50
04/14/2006 08:00 to 04/15/2006 08:00	6.41	1093.4	2.19	1.09	57.94	6519.1	2.00	1.60
05/20/2006 21:00 to 05/21/2006 21:00	5.88	1059.7	2.11	1.06	48.91	6856.0	2.09	1.68
12/09/2006 21:00 to 12/10/2006 21:00	4.84	637.5	1.27	0.64	40.07	4145.0	1.27	1.02
02/27/2007 02:00 to 02/28/2007 02:00	2.12	361.5	0.72	0.36	17.69	2324.8	0.71	0.57
09/21/2007 17:00 to 09/23/2007 12:00	58.14	995.1	1.99	1.00	486.31	6405.6	1.96	1.57
10/13/2007 00:00 to 10/14/2007 02:00	15.45	1099.0	2.20	1.10	131.33	6955.7	2.13	1.71
11/30/2007 09:00 to 12/01/2007 12:00	8.04	618.0	1.24	0.62	66.97	3990.6	1.22	0.98
01/04/2008 17:00 to 01/05/2008 23:00	48.24	1003.4	2.00	1.00	398.98	6529.7	2.00	1.60
01/06/2008 18:00 to 01/07/2008 22:00	15.12	1066.0	2.14	1.07	134.50	6515.6	1.99	1.60
01/23/2008 19:00 to 01/24/2008 19:00	1.11	1156.3	2.31	1.16	9.48	7305.4	2.24	1.80
01/25/2008 09:00 to 01/26/2008 09:00	3.01	1034.6	2.07	1.04	25.89	6480.2	1.98	1.59
02/20/2008 10:00 to 02/21/2008 10:00	2.76	0.2	0.00	0.00	23.91	1.2	0.00	0.00
02/22/2008 14:00 to 02/23/2008 15:00	2.87	1032.3	2.06	1.03	24.48	6511.7	1.99	1.60
11/26/2008 00:00 to 11/27/2008 10:00	43.97	1014.1	2.02	1.01	365.76	6559.8	2.00	1.61
12/15/2008 02:00 to 12/16/2008 18:00	35.41	1002.4	1.99	1.00	294.92	6479.4	1.97	1.59
12/22/2008 09:00 to 12/23/2008 09:00	4.95	0.0	0.00	0.00	42.26	0.1	0.00	0.00
01/24/2009 10:00 to 01/25/2009 10:00	3.85	0.5	0.00	0.00	32.84	3.0	0.00	0.00
02/05/2009 15:00 to 02/07/2009 20:00	80.03	1018.3	2.03	1.02	673.93	6516.0	1.99	1.60
02/13/2009 14:00 to 02/14/2009 14:00	3.32	1085.7	2.17	1.09	28.54	6816.1	2.08	1.67

Event Date	CALTRANS				non-CALTRANS			
	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)
02/16/2009 04:00 to 02/17/2009 07:00	21.23	1027.1	2.05	1.03	182.33	6542.1	1.99	1.60
03/04/2009 07:00 to 03/05/2009 08:00	10.89	1049.7	2.09	1.05	92.72	6644.8	2.02	1.63
10/14/2009 01:00 to 10/15/2009 02:00	4.15	1109.1	2.22	1.11	35.05	7066.4	2.16	1.74
12/07/2009 09:00 to 12/08/2009 15:00	18.60	934.2	1.86	0.93	154.30	6058.5	1.84	1.48
12/10/2009 23:00 to 12/12/2009 02:00	10.21	932.0	1.86	0.93	85.77	5969.8	1.83	1.47
12/12/2009 05:00 to 12/13/2009 10:00	13.35	835.1	1.67	0.84	111.90	5363.9	1.64	1.32
01/18/2010 04:00 to 01/23/2010 14:00	199.94	1029.0	2.03	1.02	1821.27	6420.2	1.94	1.54
02/06/2010 04:00 to 02/07/2010 09:00	48.55	1045.0	2.04	1.02	458.75	6494.7	1.95	1.52
02/09/2010 14:00 to 02/10/2010 14:00	5.71	1112.9	2.22	1.12	51.21	6805.1	2.09	1.68
02/27/2010 10:00 to 02/28/2010 16:00	47.92	677.9	1.35	0.68	408.52	4365.1	1.33	1.07
04/05/2010 09:00 to 04/06/2010 10:00	23.84	1024.0	2.05	1.02	201.14	6530.8	2.00	1.61
04/11/2010 23:00 to 04/13/2010 00:00	10.44	1073.7	2.14	1.07	91.62	6589.9	2.01	1.62
04/20/2010 14:00 to 04/21/2010 14:00	0.21	1141.6	2.28	1.14	1.86	6781.9	2.08	1.67
10/19/2010 20:00 to 10/20/2010 20:00	3.21	0.9	0.00	0.00	26.61	5.8	0.00	0.00
10/30/2010 03:00 to 10/31/2010 04:00	12.68	1175.5	2.35	1.18	106.31	7541.7	2.31	1.86
11/20/2010 05:00 to 11/22/2010 06:00	13.65	1066.4	2.13	1.07	116.02	6749.7	2.06	1.66
12/05/2010 20:00 to 12/06/2010 20:00	4.46	543.1	1.09	0.54	37.69	3459.8	1.06	0.85
12/17/2010 19:00 to 12/23/2010 16:00	305.04	1020.8	2.02	1.01	2806.14	6260.1	1.90	1.50
12/25/2010 20:00 to 12/27/2010 01:00	18.75	1194.5	2.34	1.20	208.43	6438.6	1.98	1.56
12/29/2010 05:00 to 12/30/2010 08:00	7.71	1105.3	2.19	1.11	74.38	6418.6	1.97	1.57
01/02/2011 14:00 to 01/03/2011 14:00	2.94	1094.4	2.19	1.10	25.92	6732.7	2.07	1.66
02/16/2011 07:00 to 02/17/2011 08:00	3.67	1030.6	2.06	1.03	32.65	6234.6	1.91	1.53
02/18/2011 17:00 to 02/19/2011 20:00	28.69	1031.8	2.05	1.03	239.97	6649.3	2.02	1.63

Event Date	CALTRANS				non-CALTRANS			
	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)	Volume (ac-in)	Fecal (MPN/100 mL)	TN (mg/L)	TP (mg/L)
02/25/2011 21:00 to 02/26/2011 23:00	14.59	1029.4	2.04	1.02	123.17	6682.9	2.02	1.62
03/20/2011 09:00 to 03/22/2011 16:00	167.88	1075.7	2.01	1.01	1789.85	6400.6	1.97	1.46
05/18/2011 01:00 to 05/19/2011 01:00	1.91	1058.4	2.12	1.06	17.21	6309.4	1.93	1.55

Note: Inflow timeseries were created for CALTRANS and Non-CALTRANS areas based on HRUs and percent irrigation. The bypass volume was determined in SUSTAIN, and a bypass reduction factor was calculated for each timestep by dividing the total inflow by the bypassed flow. The reduction factors were then applied to the separate inflow timeseries for CALTRANS and Non-CALTRANS.

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Appendix A - EMCs by Landuse

Table A-1. EMCs by Landuse

Landuse	TSS (mg/L)	TN (mg/L)	TP (mg/L)	Cd (µg/L)	Cu (mg/L)	Pb (mg/L)	Zn (mg/L)	Fecal (MPN/100mL)	Trash (lbs/ac/year)
Single-Family Residential (High Density)	124.20	3.74	0.40	2.13	18.70	11.30	71.90	2.79E+04	10.82
Single-Family Residential (Low Density)									9.47
Multi-Family Residential	39.90	3.31	0.23	1.10	12.10	4.50	125.10	7.62E+05	15.56
Commercial	67.00	3.99	0.40	1.00	31.40	12.44	237.10	1.74E+06	22.12
Institutional	99.60	2.32	0.30	1.49	19.90	3.60	117.60	1.73E+05	15.56
Industrial	219.20	3.74	0.39	2.03	34.50	16.40	537.40	4.23E+08	21.58
CALTRANS	77.80	2.58	0.68	1.77	32.40	9.20	292.90	4.19E+05	11.69
Secondary Roads	77.80	2.58	0.68	1.77	32.40	9.20	292.90	4.19E+05	11.69
Agriculture	124.20	3.74	0.40	2.13	18.70	11.30	71.90	2.79E+04	15.56
Vacant	216.60	2.13	0.12	0.42	10.60	3.00	26.30	3.32E+03	15.56
Water	236.86	7.02	0.64	0.60	27.37	10.02	140.52	2.25E+07	15.56

Appendix B - Credit Analysis

Table B-1. Wet Weather Credit Analysis for Long-Term (10-years)

Constituent	Unit	Long-Term TREATMENT (10/1/2002 to 9/30/2011) (Exc. Interflow/Groundwater)							Caltrans % of Project Total
		CALTRANS	Caltrans Interflow/Groundwater	CALTRANS (Exc. Interflow/Groundwater)	non-CALTRANS	non-Caltrans Interflow/Groundwater	non-CALTRANS (Exc. Interflow/Groundwater)	Project Total (Exc. Interflow/Groundwater)	
Runoff	acre-ft/d	0.9094	0.01156	0.8962	8.50495	0.99485	7.54007	8.43689	11%
TSS	lb/d	207.86403	0	207.86403	1422.4802	0	1422.4802	1630.34423	13%
TN	lb/d	5.36076	0.0158	5.34496	48.11478	1.31825	44.79653	50.14149	11%
NO ₃	lb/d	1.58251	0.00332	1.54919	11.51887	0.31175	11.20512	12.75431	12%
TP	lb/d	2.67272	0.00635	2.66445	36.39637	0.70661	35.68976	38.31422	7%
Cu	lb/d	0.06745	0	0.06745	0.53035	0	0.53035	0.6268	14%
Pb	lb/d	0.06744	0	0.06744	0.4871	0	0.4871	0.57454	15%
Zn	lb/d	0.8208	0	0.8208	5.2754	0	5.2754	6.0972	13%
Cd	lb/d	0.00415	0	0.00415	0.03725	0	0.03725	0.0414	10%
Fecal	MPN/d	1.20E+10	1.27E+08	1.22E+10	6.88E+11	2.16E+10	6.89E+11	6.78E+11	2%
Trash	lb/d	1.06302	0	1.06302	18.48661	0	18.48661	19.54963	6%

Table B-2. Wet Weather Credit Analysis for the 85th-percentile 24-hour Storm

Constituent	Unit	85 th -percentile Storm TREATMENT (Exc. Interflow/Groundwater)							Caltrans % of Project Total
		CALTRANS	Caltrans Interflow/Groundwater	CALTRANS (Exc. Interflow/Groundwater)	non-CALTRANS	non-Caltrans Interflow/Groundwater	non-CALTRANS (Exc. Interflow/Groundwater)	Project Total (Exc. Interflow/Groundwater)	
Runoff	acre-ft/d	1.43	0.06	1.37	20.23	6.12	14.11	15.48	9%
TSS	lb/d	310	0	310	7188.27	0	7188.27	7498.27	4%
TN	lb/d	10.22	0.57	9.65	211.16	79.92	131.24	140.89	7%
NO ₃	lb/d	2.92	0.12	2.8	60.97	28.87	32.1	34.9	8%
TP	lb/d	2.8	0.06	2.54	25.19	8.01	17.18	19.72	13%
Cu	lb/d	0.12	0	0.12	1.33	0	1.33	1.45	8%
Pb	lb/d	0.04	0	0.04	0.83	0	0.83	0.87	8%
Zn	lb/d	1.11	0	1.11	10.52	0	10.52	11.63	10%
Cd	lb/d	0.01	0	0.01	0.08	0	0.08	0.09	11%
Fecal	MPN/d	7.13E+10	1.94E+08	7.11E+10	1.59E+14	2.14E+10	1.59E+14	1.59E+14	0.0%
Trash	lb/d	0.59	0	0.59	10.12	0	10.12	10.71	6%

Table B-3. Wet Weather Credit Analysis for the 90th-percentile Storm

Constituent	Unit	90 th -percentile Storm TREATMENT (Exc. Interflow/Groundwater)							
		CALTRANS	Caltrans Interflow/Groundwater	CALTRANS (Exc. Interflow/Groundwater)	non-CALTRANS	non-Caltrans Interflow/Groundwater	non-CALTRANS (Exc. Interflow/Groundwater)	Project Total (Exc. Interflow/Groundwater)	Caltrans % of Project Total
Runoff	acre-ft/d	1.25796	0.0038	1.25376	10.69412	0.31205	10.35207	11.60593	11%
TSS	lb/d	206.50361	0	206.50361	1569.85625	0	1569.85625	1776.36206	12%
TN	lb/d	6.67381	0.00261	6.6712	55.29645	0.2138	55.08265	61.75398	11%
NO ₃	lb/d	1.93604	0.00056	1.93449	13.65264	0.05339	13.79945	15.73394	12%
TP	lb/d	3.34228	0.0014	3.34085	44.39054	0.11938	44.27115	47.61204	7%
Cu	lb/d	0.00005	0	0.00005	0.6019	0	0.6019	0.60195	13%
Pb	lb/d	0.00182	0	0.00182	0.5479	0	0.5479	0.53972	14%
Zn	lb/d	0.03602	0	0.03602	5.6711	0	5.6711	6.70702	12%
Cd	lb/d	0.00224	0	0.00224	0.01952	0	0.01952	0.02176	10%
Fecal	MPNd	1.50E+10	2.09E+07	1.50E+10	6.17E+11	4.50E+09	6.13E+11	6.27E+11	2%
Trash	lb/d	0.4272	0	0.4272	7.26212	0.31205	6.96007	7.40727	6%

Table B-4. Range of Credits for the Wet Weather Credit Analysis

Constituent	Range of WL Credits (Long Term, 85th Percentile, 90th Percentile EV)
	Caltrans % of Project Total
Runoff	8.0% - 10.8%
TSS	4.1% - 12.7%
TN	6.8% - 10.8%
NO ₃	8.0% - 12.3%
TP	7.0% - 12.0%
Cu	8.3% - 14.0%
Pb	6.0% - 15.2%
Zn	9.5% - 13.5%
Cd	10.0% - 11.1%
Fecal	0.0% - 1.8%
Trash	5.5% - 5.8%

Note - The range for Caltrans % of project total are based on wet weather credit analyses for the long-term, 85th-percentile 24-hour storms and 90th-percentile exceedance volume summarized in Tables B1, B2 and B3, respectively.

Table B-5. Dry Weather Credit Analysis for Long-Term (10-years)

Constituent	Unit	Long-Term TREATMENT (10/1/2002 to 9/30/2011) (Exc. Interflow/Groundwater)							WL Credit	
		CALTRANS	Caltrans Interflow/Groundwater	CALTRANS (Exc. Interflow/Groundwater)	non-CALTRANS	non-Caltrans Interflow/Groundwater	non-CALTRANS (Exc. Interflow/Groundwater)	Project Total (Exc. Interflow/Groundwater)	Caltrans % of Project Total	Caltrans % of Project Total
Runoff	acre-ft/d	0.01962	0.00673	0.01309	0.96641	0.95968	0.10786	0.12095	11%	11%
TSS	lb/d	0.96673	0	0.96673	5.32543	0	5.32543	6.29216	15%	15%
TN	lb/d	0.07257	0.00121	0.07136	0.96974	0.10183	0.53011	0.63197	11%	11%
NO ₃	lb/d	0.02595	0.00025	0.02570	0.17116	0.02363	0.14753	0.17323	12%	12%
TP	lb/d	0.02633	0.00005	0.02628	0.52033	0.05597	0.47236	0.50064	7%	7%
Cu	lb/d	0.00041	0	0.00041	0.00201	0	0.00201	0.00242	17%	17%
Pb	lb/d	0.00041	0	0.00041	0.00181	0	0.00181	0.00222	18%	18%
Zn	lb/d	0.00363	0	0.00363	0.01977	0	0.01977	0.02340	16%	16%
Cd	lb/d	0.00007	0	0.00007	0.00145	0	0.00145	0.00152	5%	5%
Facal	MPN/d	1.71E+06	9.03E+06	1.61E+06	1.03E+10	1.61E+09	8.89E+06	8.89E+06	2%	2%
Turb	lb/d	1.70911	0	1.70911	29.17362	0	29.17362	30.88273	6%	6%