STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

FOR

SOUTH BAY SUBSTATION RELOCATION PROJECT
Located Between Bay Boulevard and the Chula Vista Bayfront
Chula Vista, CA 91911
San Diego Gas & Electric Company (SDG&E)
Contract Number: 5660017866

This SWPPP has been prepared for in compliance with the State Water Resources Control Board (SWRCB) Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities.

WDID # _________

A Sempra Energy utility℠

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July 2014

**This Document Must Be Returned to
Edith Moreno at Job Completion**

EMERGENCY CONTACT INFORMATION

Use the following contact numbers if there is an injury or other non-storm water related emergency occurs during the course of the project:

SDG&E projects –

Life threatening:	911
Non-life threatening:	(619) 725-5199 (Trouble Dispatch)

See Appendix XIII for the contact information for the Legally Responsible Person (LRP), Qualified SWPPP Developer (QSD), Qualified SWPPP Practitioner (QSP) and other parties responsible for the SWPPP implementation.

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APPENDIX III – SITE MAP (Retain in this appendix the current and all historic Site Maps; the original map is located in Appendix XII)

Site map includes the following information:

- Project's surrounding area (vicinity)
- Site layout
- Construction site boundaries
- Drainage areas
- Discharge locations
- Sampling locations
- Areas of soil disturbance (temporary or permanent)
- Active areas of soil disturbance (cut or fill)
- Locations of all BMPs (original & revised)
- ATS location (if applicable)
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- Locations of all post-construction BMPs
- Locations of storage areas for waste, vehicles, service, loading/ unloading of materials, access (entrance/exits) points to construction site, fueling,

* *Blank versions of these forms can be found in Appendix I*

1 SWPPP CERTIFICATION

I, Erika Carrillo, am a **Qualified Storm Water Pollution Prevention Plan (SWPPP) Developer** and certify that I have completed this SWPPP for the **South Bay Substation Relocation Project** and/or the amendments contained herein, in compliance with the **State Water Resources Control Board** (SWRCB) Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:________________________________

Print Name: Erika Carrillo

Date: July 25, 2014

Affix Certificate Number and/or Seal here:

Certificate Number CPESC #707, QSD #23555

2 GENERAL INFORMATION

2.0 Background

This Storm Water Pollution Prevention Plan (SWPPP) has been prepared in accordance with the State Water Resources Control Board (SWRCB) Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities (Construction General Permit) (hereto referred to as the CGP). The CGP became effective on July 1, 2010.

A copy of the CGP has been included in Appendix II of this SWPPP.

The goal of this SWPPP is to protect overall water quality during construction activities. Construction activities could potentially affect water quality by the storage and handling of various construction related materials as well as by causing soil erosion or sedimentation. With the implementation of the Best Management Practices (BMPs) and/or treatment outlined in this plan, the potential for the transport of contaminants or sediment to receiving waters will be minimized.

The SWPPP must be evaluated on an ongoing basis to document the changes and progression of construction activity throughout the life of the project.

2.1 Permit Registration Documents (PRDs)

The Permit Registration Documents (PRDs) and the State Water Resources Control Board's (SWRCB) confirmation of permit coverage (and associated Waste Discharge Identification Number) are contained in Appendix XII. Copies of PRD updates and annual fee checks are also contained in Appendix XII.

2.2 SWPPP Amendments

The Qualified SWPPP Developer (QSD) must prepare and certify each SWPPP amendment.

Blank SWPPP Amendment Log forms and Certification forms are located in Appendix I. The completed SWPPP Amendment Log is located in Appendix XVI.

2.3 Availability of the SWPPP

The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by State or Municipal inspectors. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and exhibits will be left with the field crew and the original SWPPP shall be made available via a request by radio or telephone. The SWPPP shall be made available by the LRP until completion of construction activities and stabilization is achieved.

2.4 Anticipated Non-Compliance Reporting

If there is an anticipated non-compliance for the South Bay Substation Relocation Project, an “Anticipated Non-Compliance” form should be completed and retained in Appendix XVII.

This form must be completed and submitted in advance of the planned change in construction activity that may result in non-compliance with the CGP to the Regional Water Board and local storm water management agency (see contact information in Appendix XIII).

2.5 Certifications

Certification requirements are described in Sections IV.I and IV.J of the CGP Order.

2.6 Soil Contamination

If soil contamination is found, or suspected, and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the LRP shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. Sampling and testing records shall be retained in Appendix XI. The LRP shall notify the appropriate local, state, and federal agency(ies), including the Regional Water Quality Control Board (RWQCB), when contaminated soil is found at a construction site.

LRP’s shall ensure that trench spoils or any other soils disturbed during construction activities that are contaminated are not discharged with storm water or non-storm water discharges into any storm drain or water body except pursuant to a project specific NPDES permit.

2.7 Responsible Parties

Implementation of the SWPPP involves a number of responsible parties including, but not limited to, the Legally Responsible Party (LRP), Approved Signatory, Qualified SWPPP Developer (QSD) and Qualified SWPPP Practitioner (QSP). Additionally, other trained personnel may be specifically responsible for conducting inspections, sampling, and BMP installation under the direction of the QSP. These responsible parties are identified in Appendix XIII.

3 PROJECT INFORMATION

3.1 Overview

SDG&E is dedicated to providing for the energy needs of its customers through the transmission and distribution of natural gas and/or electric services. The need to upgrade existing facilities and to construct new facilities in support of new development is the primary impetus for SDG&E construction projects.

The goal of this SWPPP is to protect overall water quality during construction activities. Construction activities could potentially affect water quality by the storage and handling of various construction-related materials as well as by causing soil erosion or sedimentation. With the implementation of the Best Management Practices (BMPs) outlined in this plan, the potential for the transport of contaminants or sediment to receiving waters will be minimized.

3.2 Project Characteristics

3.2.1 Project Location

The South Bay Substation Relocation Project is located at:	
ADDRESS	**Near L Street and Bay Boulevard and the Chula Vista Bayfront**
CITY, STATE, ZIP CODE	**Chula Vista, CA 91911**
THOMAS GUIDE LOCATION	**2008, 1329, J2, San Diego County**
LATITUDE / LONGITUDE	**32.608127, -117.094303**

The project location is shown on the Site Map included in Appendix III.

3.2.2 Project Description

The South Bay Substation Relocation Project consists of relocating the existing South Bay Substation to a new site located approximately 0.5 mile south, looping in the 230 kilovolt (kV) transmission line, relocating six overhead transmission lines, and extending the connection of existing 138 kV transmission lines. The new Bay Boulevard Substation will be constructed on the southern half of a former Liquefied Natural Gas plant site in an area of open land with a man-made berm located along the southern and western end of the property. Transmission lines construction will take place in city streets and open land.

In addition to implementation of Best Management Practices (BMPs), this project will include the use of the following treatment units:

Treatment Unit	Description
☐ **Sediment Basin**	Design information for the sediment basin(s) is located in Appendix IV. Sediment particle sizing information is located in Appendix IV.
☐ **Active Treatment System (ATS) Unit**	Design and operational requirements for the ATS is located in Appendix XX. Sediment particle sizing information is located in Appendix IV.
☒ **Other:**	Design and operational requirements for the treatment is located in Appendix IV. The following paragraph describes the bioretention basin to be constructed to control and treat storm water runoff.

After construction of the Bay Boulevard Substation, SDG&E will construct a bioretention basin on the west side of the site to detain storm water runoff and treat it through settling and infiltration. The access roads and substation pad will be graded to drain the impervious asphalt concrete areas through three wall cutouts into the bioretention basin. The bioretention basin will have 1:1.5 concrete slopes with 18 inches of engineered soil (i.e., sand/compost mix) designed to maintain a five-inch-per-hour infiltration rate and treat storm water runoff. The infiltrated runoff will then drain through a gravel layer collected by three eight-inch perforated pipes and will be carried out to the existing southwest drainage point. Long-term maintenance of the bioretention basin will be the responsibility of SDG&E Facilities Department and any contractors that SDG&E choose to hire to perform the required maintenance.

The CGP identifies the following distinct phases of construction activities (listed below). Check the phases applicable to this Project:

- ☒ Grading and Land Development Phase
- ☒ Streets and Utilities Phase
- ☒ Vertical Construction Phase
- ☒ Final Landscaping and Site Stabilization, and
- ☒ Inactive Construction Phase (i.e., 14 or more days of inactivity).

This Project is/is not a part of a common plan of development or sale.

3.2.3 Soil Disturbance and Total Area Estimate

The initial estimated soil disturbance area for this Project is 70.4 acres. Changes to the initial estimate will be documented in the copies of the revised Notice of Intent documents submitted to the SWRCB (see Appendix XII).

3.2.4 Site Imperviousness

Approximately 14% of the pre-project site is impervious. Approximately 18% of the post-project site is impervious. Runoff coefficient calculations and run-on flow calculations are found in Appendix IV.

3.3 Receiving Waters

This section identifies the receiving waters into which the project discharges and the conditions and specific requirements for this project.

- **Receiving Water Name(s):** San Diego Bay and Telegraph Canyon Creek

- **Hydrologic Number(s)/Name(s):**

  San Diego Bay Hydrologic Unit, Undefined Hydrologic Sub-Area, Hydrologic Sub-Area Number 912.00;

  Otay Hydrologic Unit, Otay Valley Hydrologic Area, Undefined Hydrologic Sub-Area, Hydrologic Sub-Area Number 910.2;

  and Sweetwater Hydrologic Unit, Lower Sweetwater Hydrologic Area, Telegraph Hydrologic Sub-Area, Hydrologic Sub-Area Number 909.11

- **Surface Water Quality Objectives** applicable to this Project's receiving waters are contained in Appendix IV.

- **Specific information** for the **receiving waterbodies** and down-gradient watersheds listed above (Check all that apply):

  ☐ Listed on SWRCB's 303(d) list for sedimentation, siltation or turbidity.

    ☐ A Total Maximum Daily Load (TMDL) has been adopted to address this impairment.

    Name of Waterbody / Impairment:

    ____

    ____

    ____

    ____

    ☐ A TMDL has not yet been adopted for this impairment.

  ☒ Listed on SWRCB's 303(d) list for pollutants other than sedimentation, siltation or turbidity.

    ☐ A TMDL has been adopted to address this impairment.

Name of Waterbody / Impairment:

San Diego Bay/Polychlorinated biphenyls (PCBs)

Telegraph Canyon Creek/Selenium

☒ A TMDL has not yet been adopted for this impairment.

☒ The 303(d) and/or TMDL requirements identified above are incorporated into the SWPPP site map/plans and other appropriate sections of the SWPPP.

- **Specific information** for the **watersheds** down-gradient from the receiving water body (Check all that apply):

☒ No surface waters are listed on the SWRCB's 303(d) list for sedimentation, siltation or turbidity.

☐ A surface water body is listed on SWRCB's 303(d) list for sedimentation, siltation or turbidity.

Name of Waterbody / Impairment:

☐ A TMDL has been adopted to address this impairment.

Name of Waterbody / Impairment:

☐ A TMDL has not yet been adopted for this impairment.

☐ No surface waters are listed on the SWRCB's 303(d) list for pollutants other than sedimentation, siltation or turbidity.

☒ A surface water body is listed on SWRCB's 303(d) list for pollutants other than sedimentation, siltation or turbidity.

☐ A TMDL has been adopted to address this impairment.

Name of Waterbody / Impairment:
San Diego Bay/PCBs

☒ A TMDL has not yet been adopted for this impairment.

☐ The 303(d) and/or TMDL requirements identified above are incorporated into the SWPPP site map/plans and other appropriate sections of the SWPPP.

3.4 Wetlands

Projects that will cross or will conduct work within or immediately adjacent to waters of the US or state–only waters may require additional permits for these activities. Check all the boxes below that apply:

☒ The project will cross or involve construction activities in a US Army Corps of Engineer's jurisdictional water body (e.g., wetland or waters of the United States).

☒ Applicable federal & state permits have or will be obtained.

☒ The project will cross or involve construction activities in a state-only jurisdictional water body (e.g., wetland or waters of the state, but not of the US).

☒ Applicable state permits have or will be obtained.

3.5 Non-Storm Water Discharges

Non-storm water discharges from the project are prohibited unless they are specifically authorized by the permit.

The following checked discharges are **authorized non-storm water** discharges:

Discharge Source	Separate Permit Required?	
☐ Fire hydrant flushing	☐ Yes	☐ No
☒ Irrigation of vegetative erosion control measures	☐ Yes	☒ No
☐ Pipe flushing and testing	☐ Yes	☐ No
☒ Water to control dust	☐ Yes	☒ No

Discharge Source	Separate Permit Required?	
☒ Street cleaning	☐ Yes	☒ No
☒ Dewatering	☒ Yes	☐ No
☒ Uncontaminated ground water from dewatering	☒ Yes	☐ No
☐ Any other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board.	☐ Yes	☐ No

If dewatering is to be used, RWQCB shall be consulted on any required permits or Basin Plan conditions

The BMPs for these discharges are included in Appendix VI.

Additionally, these authorized non-storm water discharges:

- Shall not cause or contribute to a violation of any water quality standard;
- Shall not violate any other provision of the CGP;
- Shall not violate any applicable Basin Plan;
- Shall comply with BMPs as described in the SWPPP;
- Shall not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
- Shall be monitored and meets the applicable NALs; and
- Shall be reported by the discharger in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by the CGP. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not authorized by the CGP to determine the need for a separate NPDES permit.

Wherever feasible, alternatives that do not result in the discharge of non-storm water shall be implemented in accordance with Attachment A Section K.2 of the CGP.

3.6 Construction, BMP Implementation And Maintenance Schedules

The overall schedule for this project is provided below.

Estimated Date Construction will begin: *August 1, 2014*
Estimated Completion Date: *July 31, 2017*

Applicable BMPs identified in this SWPPP are to be installed concurrently with the initiation of work and as work progresses at each location and will be routinely inspected and maintained.

The schedule for the inspections and maintenance of the Final Landscaping and Site Stabilization BMPs is included in Appendix VII.

3.7 Site Maps and Diagrams

The Site Map is included in Appendix III and in the PRDs in Appendix XII.

The Site Map shows:

- Project's surrounding area (vicinity)
- Site layout
- Construction site boundaries
- Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
- Areas of soil disturbance (temporary or permanent)
- Active areas of soil disturbance (cut or fill)
- Drainage areas
- Discharge locations
- Locations of all BMPs
- ATS location (if applicable)
- Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices
- Sampling location(s)
- Locations of all post-construction BMPs
- Visual Inspection Locations

As site conditions change it is the responsibility of the QSP to document and date the BMPs implemented at the site on the Site Map.

4 RISK LEVEL 1 REQUIREMENTS

4.1 Risk Determination

A Risk Determination has been conducted for the South Bay Substation Relocation Project and this project has been determined to be a Risk Level 1. The documentation for the Risk Determination is located in Appendix IV.

A. Effluent Standards

This project must meet the following narrative effluent standards:

- o Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
- o Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

This project is a Risk Level 1 project, therefore numeric effluent limits are not applicable.

4.2 Good Site Management “Housekeeping”

The following sections describe specific measures to be implemented based on the risk level for this project. Tables have been provided for each measure described in the CGP Attachment C, D, or E that is applicable to the project’s risk level.

The first column of the table provides a measure identification number that corresponds to the applicable measure in the next column. The measures listed in the second column are required for Risk Level 1 projects.

The second column includes the substance of the risk type specific requirements from the CGP.

The third column of the table describes whether this measure is applicable to the project.

The fourth column provides one or more BMP options that correspond to each required measure. These BMP Options(s) are references to the SDG&EWater Quality Construction Best Management Practices Manual (or “BMP Manual”).

The fifth column of the table identifies the location within the SWPPP that contains the information applicable to the fourth column. The information in the fourth column is either a BMP Option or an inventory form.

Locations of the applicable measures and BMP Options are identified on the Site Map located in Appendix III. The initial layout of the BMPs has been identified by the QSD as part of the preparation of the SWPPP. As site conditions change, it will be the responsibility of the QSD to make all necessary revisions.

The QSD prepared the following tables as part of the preparation of this SWPPP. It is the responsibility of the QSP to review these tables during the course of the project and advise the QSD to update the SWPPP as applicable. In addition, a QSP Implementation Checklist has been provided in Appendix VII to document these updates, as applicable.

This section addresses good site management (i.e., "housekeeping") practices, including practices for:

A. Construction Materials
B. Waste Management
C. Vehicle Storage and Maintenance
D. Landscape Materials
E. Assessment of Potential Pollutant Sources
F. Air Deposition
G. Good Housekeeping Documentation

Tables have been provided for each good housekeeping described in the above list, with the exception of practices for “Assessment of Potential Pollutant Sources” (Sections E) and “Air Deposition” Section F. These two practices describe specific actions that ***must*** be taken to comply with the permit.

Each of the following measures is an element of Good Site Management “Housekeeping” as described in the CGP.

A. Good Site Management ("Housekeeping") Measures for Construction Materials, at a minimum, shall consist of the following:

Construction Materials (CM) Measure ID No.	**Construction Materials Measure**	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
CM-a	Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced.	**X**		QSP must conduct an inventory	Appendix V[1]
CM-b	Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).	**X**		☒ BMP 1-08	Appendix VI
CM-c	Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).	**X**		☒ BMP 2-01 ☒ BMP 2-02 ☒ BMP 2-03 ☒ BMP 2-04 ☒ BMP 2-05 ☒ BMP 2-06	Appendix VI
CM-d	Minimize exposure of construction materials with precipitation.	**X**		☒ BMP 2-01 ☒ BMP 2-02 ☒ BMP 2-03 ☒ BMP 2-04 ☒ BMP 2-05 ☒ BMP 2-06 ☒ BMP 2-07 ☒ BMP 2-08	Appendix VI
CM-e	Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.	**X**		☒ BMP 1-07	Appendix VI

[1] QSP to review List of Potential Pollutant Sources in Appendix V and complete an Inventory of Potential Pollutant Sources planned to be used or stored at the project site in Appendix V as well.

B. Good Site Management ("Housekeeping") Measures for Waste Management at a minimum, shall consist of the following:

Waste Management (WM) Measure ID No.	**Waste Management Measure**	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
WM-a	Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.	**X**		☒ BMP 3-02 ☒ BMP 3-03 ☒ BMP 3-04 ☒ BMP 3-05 ☐ BMP 3-06 ☒ BMP 3-07 ☒ BMP 3-08 ☒ BMP 3-09	Appendix VI
WM-b	Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.	**X**		☒ BMP 2-07	
WM-c	Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.	**X**		☒ BMP 2-07	Appendix VI
WM-d	Cover waste disposal containers at the end of every business day and during a rain event.	**X**		☒ BMP 2-01 ☒ BMP 2-02 ☒ BMP 2-03 ☒ BMP 2-04 ☒ BMP 2-05 ☒ BMP 2-06 ☒ BMP 2-07 ☒ BMP 2-08	Appendix VI

B. Good Site Management ("Housekeeping") Measures for Waste Management at a minimum, shall consist of the following:

Waste Management (WM) Measure ID No.	Waste Management Measure	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
WM-e	Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.	X		☒ BMP 2-01 ☒ BMP 2-02 ☒ BMP 2-03 ☒ BMP 2-04 ☒ BMP 2-05 ☒ BMP 2-06 ☒ BMP 2-07 ☒ BMP 2-08	Appendix VI
WM-f	Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.	X		☒ BMP 1-08	Appendix VI
WM-g	Implement procedures that effectively address hazardous and non-hazardous spills.	X		☒ BMP 2-03	Appendix VI
WM-h	Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that: • Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and • Appropriate spill response personnel are assigned and trained.	X		☒ BMP 2-03	Appendix VI (For spill response personnel, see Appendix XIII. For relevant training see Appendix XV.)
WM-i	Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.	X		☒ BMP 2-04	Appendix VI

C. Good Site Management ("Housekeeping") Measures for Vehicle Storage and Maintenance at a minimum, shall consist of the following:

Vehicle Storage and Maintenance (VSM) Measure ID No.	**Vehicle Storage and Maintenance Measure**	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
VSM-a	Prevent oil, grease, or fuel from leaking into the ground, storm drains or surface waters.	**X**		☒ BMP 3-03 ☒ BMP 3-04	Appendix VI
VSM-b	Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.	**X**		☒ BMP 2-03 ☒ BMP 2-02 ☒ BMP 3-03 ☒ BMP 3-04	Appendix VI
VSM-c	Clean leaks immediately and disposing of leaked materials properly.	**X**		☒ BMP 2-03	Appendix VI

D. Good Site Management ("Housekeeping") Measures for Landscape Materials at a minimum, shall consist of the following:

Landscape Materials (LM) Measure ID No.	Landscape Materials Measure	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
LM-a	Contain stockpiled materials such as mulches and topsoil when they are not actively being used.	X		☒ BMP 1-08 ☒ BMP 4-07 ☒ BMP 4-02	Appendix VI
LM-b	Contain fertilizers and other landscape materials when they are not actively being used.	X		☒ BMP 1-08 ☒ BMP 2-01 ☒ BMP 2-02	Appendix VI
LM-c	Discontinuing the application of any erodible landscape material within 2 days before a forecasted rain event[2] or during periods of precipitation.	X		☒ BMP 3-07 ☒ BMP 2-02	Appendix VI
LM-d	Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.	X		☒ BMP 3-07 ☒ BMP 2-02	Appendix VI
LM-e	Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.	X		☒ BMP 3-07 ☒ BMP 2-01 ☒ BMP 2-02	Appendix VI

[2] Excerpt from CGP – 50% or greater chance of producing precipitation.

E. Good Housekeeping for Assessment of Potential Pollutant Sources

Pollutant sources will be dynamic over the life of the construction project due to the various phases of construction.

An assessment of construction materials that may be used and activities that will be performed during this project that may have the potential to contribute pollutants, other than sediment, to storm water runoff for the project is located in Appendix V. The QSP must review the list throughout the life of the project and update it accordingly. Appropriate revisions to the SWPPP based on any changes to the list shall be made by the QSD.

In addition, a history of leaks or spills in maintained in Appendix XIV.

F. Good Housekeeping for Control of Air Deposition

This project shall implement good housekeeping measures on the construction site related to Air Deposition:

Air Deposition (AD) Measure ID No.	**Air Deposition Measures**	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
AD-a	Control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.	**X**		☒ BMP 4-08	Appendix VI

G. "Good Housekeeping" Documentation

The project is a Risk Level 1 project, therefore, Good Housekeeping Documentation is not applicable for this project.

4.3 Non-Storm Water Management

All non-storm water discharges are required to be controlled. BMPs must be implemented for construction related activities that are potential sources of discharges other than storm water.

Implement the following measures to control all Non-Storm Water Discharges during construction:

Non-Storm Water Management (NSWM) Measure ID No.	**Non-Storm Water Management Measure**	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
NSWM-a	Implement measures to control all non-storm water discharges during construction.	**X**		☒ BMP 3-03 ☒ BMP 3-02 ☒ BMP 1-07	Appendix VI
NSWM-b	Wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.	**X**		☒ BMP 3-03	Appendix VI
NSWM-c	Clean streets in such a manner as to prevent non-storm water discharges from reaching surface water or MS4 drainage systems.	**X**		☒ BMP 3-02 ☒ BMP 1-07	Appendix VI

4.4 Erosion Control Measures

Erosion is the detachment of soil from existing landscapes by water or wind. Erosion is a natural process that can be accelerated by construction activities such as grading or trenching. For example, when a site is cleared or grubbed, protective vegetation is removed and the disturbed soil is directly exposed to wind and water. Erosion controls protect the surface and prevent the soil particles from being detached by rainfall or wind. BMPs for erosion control include soil stabilization.

Erosion Control measures, at a minimum, shall consist of the following:

Erosion Control (EC) Measure ID No.	**Erosion Control Measures**	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
EC-a	Implement effective wind erosion control.	**X**		☒ BMP 4-08	Appendix VI
EC-b	Provide effective soil cover for inactive[3] areas and all finished slopes, open space, utility backfill, and completed lots.	**X**		☒ BMP 4-02 ☒ BMP 4-03 ☒ BMP 4-04 ☒ BMP 4-05 ☒ BMP 4-06 ☒ BMP 4-07	Appendix VI
EC-c	Limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the LRP shall consider the use of plastic materials resistant to solar degradation.	**X**		☒ BMP 4-07	Appendix VI

[3] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

4.5 Sediment Control Measures

Sediment Control measures, at a minimum, shall consist of the following:

Sediment Control (SC) Measure ID No.	**Sediment Control Measure**	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
SC-a	Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.	**X**		☒ BMP 1-01 ☒ BMP 1-02 ☒ BMP 1-03 ☒ BMP 1-04 ☒ BMP 1-05 ☒ BMP 1-06 ☒ BMP 1-07 ☒ BMP 1-08	Appendix VI
SC-b	On sites where sediment basins are to be used, at a minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook	**X**		N/A	Appendix VI
SC-c	Implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active[4] construction.	**X**		☒ BMP 4-02 ☒ BMP 4-03 ☒ BMP 4-04 ☒ BMP 4-05 ☒ BMP 4-06 ☒ BMP 4-07	Appendix VI
SC-d	Apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[5] in accordance with Table 1 (See Table 1 below).	**X**		☒ BMP 1-02 ☒ BMP 1-03	Appendix VI
SC-e	Ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.	**X**		☒ BMP 1-07	Appendix VI

[4] Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage, and the vertical construction stage.
[5] Sheet flow length is the length that shallow, low velocity flow travels across a site.

Sediment Control (SC) Measure ID No.	**Sediment Control Measure**	Applicable to Project?		BMP Option (check applicable option(s))	Location in SWPPP
		Yes	No		
SC-f	Ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire wash-off locations) are maintained and protected from activities that reduce their effectiveness.	**X**		☒ BMP 1-06	Appendix VI
SC-g	Inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the LRP shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).	**X**		☒ BMP 1-07	Appendix VI
SC-h	The RWQCB may require LRP's to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section is not adequately protecting the receiving waters.	**X**		N/A	Appendix VI

Table 1 - Critical Slope/Sheet Flow Length Combinations (from Attachments D & E of the CGP; also see ID No. SC-d)

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

4.6 Run-On and Run-Off Controls

Run-on and Run-off Controls shall be effectively managed for all run-on/run-off associated with the site and all runoff that discharges off the site, through the following measures:

Run-on and Run-off Control (RRC) Measure ID No.	**Run-on and Run-off Control Measure**	Applicable to Project?		Location in SWPPP
		Yes	No	
RRC-a	Effectively manage all run-on, all runoff within the site and all runoff that discharges off the site.	**X**		Appendix VI
RRC-b	Run-on from off-site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitation in the CGP.		**X**[6]	Appendix VI

[6] Run-on is controlled by curb and gutter on Bay Boulevard.

4.7 Inspection, Maintenance and Repair

Inspections shall be conducted by the QSP or a trained individual directed by a QSP (also referred to in this section as the QSP).

For each inspection required for this Risk Level 1 project, the QSP shall complete a Site Inspection Form. (Blank Inspection Forms are located in Appendix I. Completed Site Inspection Forms are retained in Appendix IX.)

Prior to conducting a site inspection, the QSP will obtain weather information at the following website: http://www.srh.noaa.gov/forecast and attach the information to the Site Inspection Form.

If failures or other shortcomings are identified by the QSP, the BMPs will be repaired or design changes will be implemented within 72 hours of identification and completed as soon as possible.

Project Specific Inspection Requirements:

The Site Inspection Form shall remain on-site with the SWPPP and at a minimum shall include:

- Inspection date and date the inspection report was written.
- Weather information (rain gauge), including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
- Site information, including stage of construction, activities completed, and approximate area of the site exposed.
- A description of any BMPs evaluated and any deficiencies noted.
- If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
- Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
- Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
- Photographs taken during the inspection, if any. These photos should be representative of actual site conditions, and be time stamped (dated).

- Inspector's name, title, and signature.

4.8 Rain Event Action Plan (REAP)

The South Bay Substation Relocation Project is a Risk Level 1, therefore, a REAP is not required.

5 CONSTRUCTION SITE MONITORING PROGRAM (CSMP)

The Construction Site Monitoring Program (CSMP) for this project is located in Appendices X and XI of this SWPPP.

6 RECORD-KEEPING

Records of all storm water monitoring information and copies of all reports (including Annual Reports) shall be retained for a period of at least three years. If, after three years the RWQCB has not required the records to be retained for a longer period, these records shall be managed in accordance with the company's record retention policy. All records shall be retained on-site while construction is ongoing. These records include:

- The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation
- The names of individual(s) who performed the site inspections, sampling, visual observation (inspections), and or measurements
- The date and approximate time of analyses
- The individual(s) who performed the analyses
- A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used, and the chain of custody forms
- Rain gauge readings from visual observations (inspections)
- Quality assurance/quality control records and results
- Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 of the CGP)
- Visual observation and sample collection exception records (see Section I.6 of the CGP), including the corrective actions taken in response to the observations
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections and
- All field and/or analytical data.

After three years, records associated with the SWPPP shall be retained in accordance with the company's record retention policy.

All of these records can be found in Appendix XI in this SWPPP.

6.1 Annual Reports

The Annual Report must be certified by the LRP. A blank certification form is located in Appendix I. Include the signed certification form with the Annual Report submittal.

Records of the Annual Reports are maintained in Appendix XVII of this SWPPP.

The LRP shall prepare and electronically submit an Annual Report no later than September 1 of each year.

Refer to the CGP Section XVI for all pertinent submittal requirements.

7 TRAINING

The LRP shall ensure that all persons responsible for implementing requirements of the CGP are appropriately trained in accordance with the requirements described in Section VII of the CGP and shall provide documentation of all training for persons responsible for implementing the requirements of the CGP in the Annual Reports.

Specific training conducted for the project and documentation of the training is the responsibility of the QSP.

Storm water pollution prevention training should be provided regularly. Topics can include, but are not limited to:

- spill prevention and response
- inspections
- annual reporting
- locations and functions of sediment/erosion control devices
- good housekeeping
- sampling
- fines and penalties
- material management practices
- ATS (if appropriate).

Blank Training Logs can be found in Appendix I. Attendance records for each training session should be kept in Appendix XV. Training records for the QSD, QSP and individuals directed by the QSP are also located in Appendix XV.

APPENDIX I:

BLANK FORMS

ANNUAL REPORTING FORM
(Store Completed Forms in Appendix XVII)

Project Name ______________________________

WDID Number ______________________________

- Electronically submit no later than September 1 of each year
- Keep a copy in Appendix XVII of the SWPPP. Retain an electronic or paper copy for a minimum of three years after the date that the Annual Report is filed; after three years, retain in accordance with the company's record retention policy.

This Annual Reporting Form is for the period of _______ to _______ and includes the following documents:

Training Information: (See Appendix XV)

1. Documentation of all training for individuals responsible for all activities associated with compliance with this Construction General Permit (CGP);
2. Documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and
3. Documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

Storm Water Monitoring Information: (See Appendix XI)

1. A summary and evaluation of all sampling and analysis results, including original laboratory reports;
2. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");
3. A summary of all corrective actions taken during the compliance year;
4. Identification of any compliance activities or corrective actions that were not implemented;
5. A summary of all violations of the Construction General Permit (CGP);
6. The names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;
7. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and
8. The visual observation and sample collection exception records and reports specified in Attachment A of the CGP.

Refer to Section XVI of the CGP for additional information specific to the Annual Reporting Requirements.

BMP SELECTION WORKSHEET
(Store Completed Forms in Appendix VII)

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs	Option 1	Option 2
Section 1 Sediment Controls				
BMP-1-02	Silt Fence	☐	*_*_*	-SF-
BMP-1-03	Fiber Rolls	☐	- - -	-FR-
BMP-1-04	Gravel Bag Berm	☐	○○○	~GBB~
BMP-1-05	Sand Bag Barrier	☐	●●●	-SBB-
BMP-1-06	Storm Drain Inlet Protection	☐	□	-SDIP-
BMP-1-07	Tracking Controls	☐	■	-TC-
BMP-1-08	Stockpile Management	☐	◊	-SM-
Other – User Defined	BMP Description	☐		
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		
Section 2 Waste Management and Material Controls				
BMP-2-01	Material Delivery and Storage	☐	»»»»	-MDS-
BMP-2-02	Material Use	☐	☼	-MV-
BMP-2-03	Spill Control	☐		-SC-
BMP-2-04	Solid Waste Management	☐	○-○-○	-SWM-

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs	Option 1	Option 2
BMP-2-05	Hazardous Materials/Waste Management	☐		-HM/WM-
BMP-2-06	Contaminated Soil Management	☐		-CSM-
BMP-2-07	Sanitary/Septic Waste Management	☐	▲	-S/SWM-
BMP-2-08	Liquid Waste Management	☐	△	-LWM-
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		
Section 3 Non-Storm Water Discharge Controls				
BMP-3-01	Dewatering Operations	☐	☆	-DW-
BMP-3-02	Paving Operations	☐	●-●-●	-PO-
BMP-3-03	Vehicle and Equipment Washing	☐	⬠	-VEW-
BMP-3-04	Vehicle and Equipment Fueling	☐		-VEF-
BMP-3-05	Concrete/Coring/Saw Cutting and Drilling Waste Management	☐	⊗	-CWM-
BMP-3-06	Dewatering Utility Substructures and Vaults	☐	▶	-DUS&V-
BMP-3-07	Vegetation Management including Mechanical and Chemical Weed Control	☐	⇔	-VM-
BMP-3-08	Over-Water Protection	☐		-OWP-
BMP-3-09	Removal of Utility Location/Mark-Out Paint	☐		-UL-
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs	Option 1	Option 2
Section 4 Erosion Control and Soil Stabilization				
BMP-4-01	Preservation of Existing Vegetation	☐	▼	-PEV-
BMP-4-02	Temporary Soil Stabilization	☐	■-■-■	-TSS-
BMP-4-03	Hydraulic Mulch	☐	≈≈≈≈	-M-
BMP-4-04	Hydroseeding	☐	>>>>	-BP-
BMP-4-05	Soil Binders	☐	¬¬¬¬	-SOS-
BMP-4-06	Straw Mulch	☐	««««	-S-
BMP-4-07	Geotextiles, Plastic Covers and Erosion Control Blankets/Mats	☐	¤¤¤¤	-ECB-
BMP-4-08	Dust (Wind Erosion) Control	☐	....	-WE-
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs	Option 1	Option 2
Section 5 Streambed Discharges and Crossings				
CASQA EC-10	Velocity Dissipation Devices	☐	≡≡≡≡	-VDD-
CASQA EC-12	Streambank Stabilization	☐	~~~~	-SBS-
CASQA NS-4	Temporary Stream Crossing	☐	<<<<	-TSC-
CASQA NS-5	Clear Water Diversion	☐	+++++	-CWD-
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		

QSD CERTIFICATION FORM
(Store Completed Forms in Appendix XII)

Project Name ______________________________

WDID Number ______________________________

This certification is for:

(Check the appropriate box and provide a brief description of any amendment or the other certification being made.)

☐ Amendment to SWPPP (Appendix XVI)
____

☐ Other ______________________________

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name	Title
Company	Telephone Number
Signature	Date

HISTORY OF LEAKS AND SPILLS
(Completed Form Stored in Appendix XIV)

Immediately report any leaks or spills to the LRP

Name ______________________________

Phone Number ______________________________

Date & Time of incident or
time of discovery of spill: ______________________________

Material Spilled: ☐ Liquid ☐ Solid ☐ Gas

What is it used for? ______________________________

Known dangerous quantities? ______________________________

MDSD available ☐ YES * ☐ NO
If yes, consult the MSDS sheet for appropriate handling, storage and disposal practices

Chemical or Trade Name ______________________________

Estimate Amount
☐ ______________ *Gallons if liquid*
☐ ______________ *Pounds if solid or gas*
☐ ______________ *Leaked or Spilled*

Potential dangers (as appropriate) ☐ Fire ☐ Explosion ☐ Toxic Fumes & Fluids ☐ Threat to life or property

☐ Other (describe): ______________________________

Cause and source of incident (e.g., human error, corrosion):
____
____
____

INVENTORY OF POTENTIAL POLLUTANT SOURCES PLANNED TO BE USED OR STORED AT THE PROJECT SITE (Store Completed Forms in Appendix V)

The QSP shall conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced at the site.

A list of possible products that are typically **found** at construction sites are listed in Appendix V.

Typical Materials Handled, Produced, Stored, Recycled, or Disposed of at the Site	Quantity (e.g., gal, lbs, oz)	Physical Characteristics (e.g., liquid, powder, solid)	Location of Each Material	Proximity to Storm Drain Inlet/Receiving Waters

Based on the table above, describe the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water (i.e.,proximity to storm drain inlets or receiving waters).

Describe BMPs implemented to address these pollutant sources:

Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

Based on the inventory and evaluation above, describe the anticipated pollutants for the project below and include them in the CSMP in Appendix X of the SWPPP.

LIST OF RESPONSIBLE PARTIES
(Store in Appendix XIII)

PROJECT: ____________________ **WDID** ____________

☐ ***LEGALLY RESPONSIBLE PART (LRP)***	☐ ***THE LRP's APPROVED SIGNATORY***
AREA OF RESPONSIBILITY:	

NAME ____________ **TITLE:** ____________
COMPANY NAME: ____________
ADDRESS ____________
CITY ____________ **STATE** ____________ **ZIP** ____________
TELEPHONE ____________
EMERGENCY TELEPHONE ____________
FAX ____________
E-MAIL ____________

QUALIFIED SWPPP DEVELOPER (QSD):PRIMARY SWPPP DEVELOPER:

NAME ____________ **TITLE:** ____________
COMPANY NAME: ____________
ADDRESS ____________
CITY ____________ **STATE** ____________ **ZIP** ____________
TELEPHONE ____________
EMERGENCY TELEPHONE ____________
FAX ____________
E-MAIL ____________

ADDITIONAL QSDs:	

NAME ____________ **TITLE:** ____________
COMPANY NAME: ____________
ADDRESS ____________
CITY ____________ **STATE** ____________ **ZIP** ____________
TELEPHONE ____________
EMERGENCY TELEPHONE ____________
FAX ____________
E-MAIL ____________

DATES WORKED ON PROJECT

QUALIFIED SWPPP PRACTITIONER (QSP):	
AREA OF RESPONSIBILITY:	

NAME **TITLE:**
COMPANY NAME:
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX
E-MAIL
START DATE **END DATE**

ADDITIONAL QSP:	
AREA OF RESPONSIBILITY:	

NAME **TITLE:**
COMPANY NAME:
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX
E-MAIL
START DATE **END DATE**

SPILL RESPONSE PERSONNEL

NAME **TITLE:**
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX

E-MAIL
START DATE **END DATE**

SPILL RESPONSE PERSONNEL

NAME **TITLE:**
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX
E-MAIL
START DATE **END DATE**

SPILL RESPONSE PERSONNEL

NAME **TITLE:**
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX
E-MAIL
START DATE **END DATE**

SPILL RESPONSE PERSONNEL

NAME **TITLE:**
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX
E-MAIL
START DATE **END DATE**

STORM WATER SAMPLING AGENT:

CONTACT PERSON ____________ **TITLE:** ____________
ADDRESS ____________
CITY ____________ **STATE** ____________ **ZIP** ____________
TELEPHONE ____________
EMERGENCY TELEPHONE ____________
FAX ____________
E-MAIL ____________
START DATE ____________ **END DATE** ____________

STORM WATER SAMPLING AGENT:

CONTACT PERSON ____________ **TITLE:** ____________
ADDRESS ____________
CITY ____________ **STATE** ____________ **ZIP** ____________
TELEPHONE ____________
EMERGENCY TELEPHONE ____________
FAX ____________
E-MAIL ____________
START DATE ____________ **END DATE** ____________

STORM WATER SAMPLING AGENT:

CONTACT PERSON ____________ **TITLE:** ____________
ADDRESS ____________
CITY ____________ **STATE** ____________ **ZIP** ____________
TELEPHONE ____________
EMERGENCY TELEPHONE ____________
FAX ____________
E-MAIL ____________
START DATE ____________ **END DATE** ____________

STORM WATER SAMPLING AGENT:					
CONTACT PERSON		**TITLE:**			
ADDRESS					
CITY		**STATE**		**ZIP**	
TELEPHONE					
EMERGENCY TELEPHONE					
FAX					
E-MAIL					
START DATE		**END DATE**			

REGIONAL BOARD CONTACT INFORMATION		***RQWQB NAME:***			
CONTACT PERSON		**TITLE:**			
ADDRESS					
CITY		**STATE**		**ZIP**	
TELEPHONE					
EMERGENCY TELEPHONE					
FAX					
E-MAIL					

LOCAL STORM WATER MANAGEMENT AGENCY		***AGENCY NAME:***			
CONTACT PERSON		**TITLE:**			
ADDRESS					
CITY		**STATE**		**ZIP**	
TELEPHONE					
EMERGENCY TELEPHONE					
FAX					
E-MAIL					

ORIGINAL - MAKE COPIES

☐ *CONTRACTOR* ☐ *SUBCONTRACTOR* ☐ *INDIVIDUAL DIRECTED BY QSP* ☐ *OTHER*

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

COMPANY NAME ______________________________

CONTACT PERSON ______________________ **TITLE:** ______________

ADDRESS ______________________________

CITY ______________ **STATE** ______________ **ZIP** ______________

TELEPHONE ______________________________

EMERGENCY TELEPHONE ______________________________

FAX ______________________________

E-MAIL ______________________________

START DATE ______________ **END DATE** ______________

☐ *CONTRACTOR* ☐ *SUBCONTRACTOR* ☐ *INDIVIDUAL DIRECTED BY QSP* ☐ *OTHER*

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME ______________________ **TITLE:** ______________

ADDRESS ______________________________

CITY ______________ **STATE** ______________ **ZIP** ______________

TELEPHONE ______________________________

EMERGENCY TELEPHONE ______________________________

FAX ______________________________

E-MAIL ______________________________

START DATE ______________ **END DATE** ______________

☐ *CONTRACTOR* ☐ *SUBCONTRACTOR* ☐ *INDIVIDUAL DIRECTED BY QSP* ☐ *OTHER*

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME ______________________ **TITLE:** ______________

ADDRESS ______________________________

CITY ______________ **STATE** ______________ **ZIP** ______________

TELEPHONE ______________________________

EMERGENCY TELEPHONE ______________________________

FAX ______________________________

E-MAIL ______________________________

START DATE		**END DATE**	

☐ ***CONTRACTOR*** ☐ ***SUBCONTRACTOR*** ☐ ***INDIVIDUAL DIRECTED BY QSP*** ☐ ***OTHER***
PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME ______ **TITLE:** ______
ADDRESS ______
CITY ______ **STATE** ______ **ZIP** ______
TELEPHONE ______
EMERGENCY TELEPHONE ______
FAX ______
E-MAIL ______
START DATE ______ **END DATE** ______

☐ ***CONTRACTOR*** ☐ ***SUBCONTRACTOR*** ☐ ***INDIVIDUAL DIRECTED BY QSP*** ☐ ***OTHER***
PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME ______ **TITLE:** ______
ADDRESS ______
CITY ______ **STATE** ______ **ZIP** ______
TELEPHONE ______
EMERGENCY TELEPHONE ______
FAX ______
E-MAIL ______
START DATE ______ **END DATE** ______

☐ ***CONTRACTOR*** ☐ ***SUBCONTRACTOR*** ☐ ***INDIVIDUAL DIRECTED BY QSP*** ☐ ***OTHER***
PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME ______ **TITLE:** ______
ADDRESS ______
CITY ______ **STATE** ______ **ZIP** ______
TELEPHONE ______
EMERGENCY TELEPHONE ______
FAX ______
E-MAIL ______

START DATE ______ **END DATE** ______

☐ ***CONTRACTOR*** ☐ ***SUBCONTRACTOR*** ☐ ***INDIVIDUAL DIRECTED BY QSP*** ☐ ***OTHER***

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME ______ **TITLE:** ______
ADDRESS ______
CITY ______ **STATE** ______ **ZIP** ______
TELEPHONE ______
EMERGENCY TELEPHONE ______
FAX ______
E-MAIL ______
START DATE ______ **END DATE** ______

☐ ***CONTRACTOR*** ☐ ***SUBCONTRACTOR*** ☐ ***INDIVIDUAL DIRECTED BY QSP*** ☐ ***OTHER***

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME ______ **TITLE:** ______
ADDRESS ______
CITY ______ **STATE** ______ **ZIP** ______
TELEPHONE ______
EMERGENCY TELEPHONE ______
FAX ______
E-MAIL ______
START DATE ______ **END DATE** ______

☐ ***CONTRACTOR*** ☐ ***SUBCONTRACTOR*** ☐ ***INDIVIDUAL DIRECTED BY QSP*** ☐ ***OTHER***

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME ______ **TITLE:** ______
ADDRESS ______
CITY ______ **STATE** ______ **ZIP** ______
TELEPHONE ______
EMERGENCY TELEPHONE ______
FAX ______

E-MAIL ____________________

START DATE ____________________ **END DATE** ____________________

NOTIFICATION OF ANTICIPATED NON-COMPLIANCE
(Store Completed Forms in Appendix XVII)

This form will be used to report instances of anticipated non-compliance. The LRP must provide advanced notice to the local Regional Water Quality Control Board and local Storm Water Management Agency (see Appendix XIII for the relevant contact information).

WDID Number:_______________________________________

In accordance/compliance with the **State Water Resources Control Board** (SWRCB) Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities, the following discharge is anticipated:

Nature of planned change in construction activity that may result in non-compliance with CGP requirements:

Date, time, and location of anticipated discharge:

Name of LRP or Approved Signatory	Title
Company	Telephone Number
Signature	Date

QSP IMPLEMENTATION CHECKLIST
(Store Completed Forms in Appendix VII)

The QSP completes this checklist prior to each phase of construction.

Phase of construction: ____

A. Good Site Management ("Housekeeping") Measures for Construction Materials:

Construction Materials Measures ID No.	Construction Materials Measures	BMP Option			Alternative BMP Option
			Implemented?		*Describe why BMP was not implemented
			Y	N*	
CM-b	Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).	BMP-2-01 BMP-2-02 BMP-2-03 BMP-2-04 BMP-2-05 BMP-2-06			
CM-c	Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).	BMP-2-01 BMP-2-02 BMP-2-03 BMP-2-04 BMP-2-05 BMP-2-06 BMP-2-07 BMP-2-08			
CM-d	Minimize exposure of construction materials with precipitation.	BMP 1-07			

[1] QSP to review List of Potential Pollutant Sources in Appendix V and complete an Inventory of Potential Pollutant Sources planned to be used or stored at the project site in Appendix V as well.

B. Good Site Management ("Housekeeping") Measures for Waste Management:

Construction Materials Measures ID No.	Construction Materials Measures	BMP Option			Alternative BMP Option
			Implemented?		*Describe why BMP was not implemented
			Y	N*	
WM-a	Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.	BMP 3-02 BMP 3-03 BMP 3-04 BMP 3-05 BMP 3-06 BMP 3-07 BMP 3-08 BMP 3-09			
WM-b	Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.	BMP 2-07			

B. Good Site Management ("Housekeeping") Measures for Waste Management:

Construction	Construction Materials Measures	BMP Option			Alternative BMP Option
WM-c	Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.	BMP 2-07			
WM-d	Cover waste disposal containers at the end of every business day and during a rain event.	BMP 2-01 BMP 2-02 BMP 2-03 BMP 2-04 BMP 2-05 BMP 2-06 BMP 2-07 BMP 2-08			
WM-e	Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.	BMP 2-01 BMP 2-02 BMP 2-03 BMP 2-04 BMP 2-05 BMP 2-06 BMP 2-07 BMP 2-08			
WM-f	Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.	BMP 1-08			
WM-g	Implement procedures that effectively address hazardous and non-hazardous spills.	BMP 2-03			
WM-h	Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that: • Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and • Appropriate spill response personnel are assigned and trained.	BMP 2-03			
WM-i	Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.	BMP 2-04			

C. Good Site Management ("Housekeeping") Measures for Vehicle Storage and Maintenance:

Construction Materials Measures	BMP Option			Alternative BMP Option
		Implemented?		*Describe why BMP was not implemented
		Y	N*	

C. Good Site Management ("Housekeeping") Measures for Vehicle Storage and Maintenance:

Construction Materials Measures		BMP Option			Alternative BMP Option
VSM-a	Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.	BMP 3-03 BMP 3-04 BMP 3-05			
VSM-b	Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.	BMP 2-03 BMP 2-02 BMP 3-03 BMP 3-04			
VSM-c	Clean leaks immediately and disposing of leaked materials properly.	BMP 2-03			

D. Good Site Management ("Housekeeping") Measures for Landscape Materials:

Landscape Materials Measures		BMP Option			Alternative BMP Option
			Implemented?		*Describe why BMP was not implemented
			Y	N*	
LM-a	Contain stockpiled materials such as mulches and topsoil when they are not actively being used.	BMP 1-08 BMP 4-07 BMP 4-02			
LM-b	Contain fertilizers and other landscape materials when they are not actively being used.	BMP 1-08 BMP 2-01 BMP 2-02			
LM-c	Discontinuing the application of any erodible landscape material within 2 days before a forecasted rain event[2] or during periods of precipitation.	BMP 3-07 BMP 2-02			
LM-d	Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.	BMP 3-07 BMP 2-02			
LM-e	Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.	BMP 3-07 BMP 2-01 BMP 2-02			

[2] Excerpt from CGP – 50% or greater chance of producing precipitation.

F. Good Site Management ("Housekeeping") Measures for Air Deposition:

Air Deposition		BMP Option			Alternative BMP Option
			Implemented?		*Describe why BMP was not implemented
			Y	N*	
AD-a	Control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash,	BMP 4-08			

F. Good Site Management ("Housekeeping") Measures for Air Deposition:

Air Deposition		BMP Option			Alternative BMP Option
	metals, bacteria, oil and grease and organics.				

Non-Storm Water Management:		BMP Option			Alternative BMP Option
			Implemented?		*Describe why BMP was not implemented
			Y	N*	
NSWM-a	Implement measures to control all non-storm water discharges during construction.	BMP 3-03 BMP 3-02 BMP 1-07			
NSWM-b	Wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.	BMP 3-03			
NSWM-c	Clean streets in such a manner as to prevent non-storm water discharges from reaching surface water or MS4 drainage systems.	BMP 3-02 BMP 1-07			

[2] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

Erosion Control		BMP Option			Alternative BMP Option
			Implemented?		*Describe why BMP was not implemented
			Y	N*	
ECM-a	Effective wind erosion control	BMP 4-08			
ECM-b	Provide effective soil cover for inactive[3] areas and all finished slopes, open space, utility backfill, and completed lots.	BMP 4-02 BMP 4-03 BMP 4-04 BMP 4-05 BMP 4-06 BMP 4-07			
ECM-c	Limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.	BMP 4-07			

[3] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

Sediment Control: SC-c, SC-d, SC-e, SC-f, SC-g, SC-h are not applicable to Risk Level 1 projects. If the project is a Risk Level 1, delete SC-c, SC-d, SC-e, SC-f, SC-g, SC-h in the table below. SC-h also does not apply to Risk Level 2 projects; delete this BMP if the project is Risk Level 2.

Sediment Control		BMP Option			Alternative BMP Option
			Implemented?		*Describe why BMP was not implemented
			Y	N*	
SC-a	Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.	BMP 1-01 BMP 1-02 BMP 1-03 BMP 1-04 BMP 1-05 BMP 1-06 BMP 1-07 BMP 1-08			
SC-b	On sites where sediment basins are to be used, at a minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook	N/A			
SC-c	Implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active[4] construction.	BMP 4-02 BMP 4-03 BMP 4-04 BMP 4-05 BMP 4-06 BMP 4-07			
SC-d	Apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[5] in accordance with Table 1.	BMP 1-02 BMP 1-03			
SC-e	Ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.	BMP 1-07			
SC-f	Ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.	BMP 1-06			

[4] Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage, and the vertical construction stage.

[5] Sheet flow length is the length that shallow, low velocity flow travels across a site.

Sediment Control		BMP Option			Alternative BMP Option
SC-g	Inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).	BMP 1-07			
SC-h	The Regional Water Board may require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.	N/A			

Excerpt from the CGP Attachment D:
Excerpt from the CGP Attachment E:

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

Run-on and Run-off Controls		Applicable to Project?		Alternative BMP Option
		Y	N*	*Describe why BMP was not implemented
RRC-a	Effectively manage all run-on, all runoff within the site and all runoff that discharges off the site.			
RRC-b	Run-on from off-site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitation in the CGP.			

RECORD OF PRD FILING
(Store Completed Forms in Appendix XII)

PRDs were filed on: (date)___________________

Copy of Submittal:

The following documents, except the Annual Fee which was mailed, were submitted electronically to the SWRCB:

- ☐ Notice of Intent (NOI) (See Appendix __)
- ☐ Risk Determination (See Appendix__)
- ☐ Site Map (See Appendix___)
- ☐ Storm Water Pollution Prevention Plan (See Appendix__)
- ☐ Annual Fee (See Appendix___)
- ☐ Signed Certification Statement downloaded from SMARTS (See Appendix___)

A Sempra Energy utility®

CHAIN OF CUSTODY/SAMPLE SUBMITTAL FORM

ENVIRONMENTAL ANALYSIS LABORATORY
6555 Nancy Ridge Drive, Suite 300, San Diego, CA 92121-3221
Office: 619-260-5747 Fax: 858-514-0154

LAB NO.

WORK ID	CLIENT'S NAME	**CLIENT CODE**
SAMPLED BY (Print & Signature)	CLIENT'S PHONE	**PROJECT CODE**
CLIENT'S ADDRESS	No. OF CONTAINERS	**DUE DATE**

SAMPLE ID	DATE	TIME	SAMPLE TYPE	SAMPLE CONTAINER	PRESERVATION	ANALYSIS NEEDED	TEST CODE(S)

COMMENTS

RELEASING	**DATE**	**TIME**	**ACCEPTING**	**DATE**	**TIME**
RELEASING	**DATE**	**TIME**	**ACCEPTING**	**DATE**	**TIME**

CHAIN OF CUSTODY/SAMPLE SUBMITTAL FORM

SDGE
A Sempra Energy utility®

ENVIRONMENTAL ANALYSIS LABORATORY
6555 Nancy Ridge Drive, Suite 300, San Diego, CA 92121-3221
Office: 619-260-5747 Fax: 858-514-0154

LAB NO.
The lab assigns a unique tracking number

WORK ID	Fill in your work name or project name here	CLIENT'S NAME Person who receives report	**CLIENT CODE** The lab assigns a client code
SAMPLED BY (Print & Signature)	Person who samples prints & signs their name	CLIENT'S PHONE Contact number for client	**PROJECT CODE** The lab assigns a project code
CLIENT'S ADDRESS	Where you'd like the report sent	No. OF CONTAINERS Number of containers submitted	**DUE DATE** Turn around time needed or due date

SAMPLE ID	DATE	TIME	SAMPLE TYPE	SAMPLE CONTAINER	PRESERVATION	ANALYSIS NEEDED	TEST CODE(S)
Your sample name(s)	Date	Time	Sample	Container type and size	Preservation required by method	Testing needed	Test codes assigned
↓	sample	sample	Matrix:	↓	↓	↓	by the lab
↓	taken	taken	water,	↓	↓	↓	
↓	↓	↓	solid,	↓	↓	↓	
↓	↓	↓	or gas,	↓	↓	↓	
↓	↓	↓	↓	↓	↓	↓	
↓	↓	↓	↓	↓	↓	↓	
↓	↓	↓	↓	↓	↓	↓	
↓	↓	↓	↓	↓	↓	↓	
↓	↓	↓	↓	↓	↓	↓	

COMMENTS Enter any additional information here

RELEASING Person dropping off samples signs	**DATE** date	**TIME** time	**ACCEPTING** Lab signs for samples	**DATE** date	**TIME** time
RELEASING	**DATE**	**TIME**	**ACCEPTING**	**DATE**	**TIME**

SAMPLING EVENT WORKSHEET
(Store Completed Forms in Appendix XI.D)

Name of Inspector: ______________________

Storm Event Date(s): ______________________

Rain Gauge Readings: ____________ Risk Level: ____________

Samples collected:

☐ Qualifying Rain Event

Samples not collected:

☐ Non-Target Storm Event – Event was not preceded by 72 hours of dry weather

☐ Non-Target Storm Event – Event occurred outside of daylight hours

☐ False Alert – Predicted storm event never started or did not produce runoff

☐ Compliance Storm Event Exception

☐ Dangerous Conditions

☐ Outside Business Hours

Storm Start Time:		Storm End Time:	

Runoff Start Time:		Total Precipitation:	

Check All That Apply (complete form for each sampling location per day):

☐ Dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more with a 48 hour or greater period between rain events)

☐ Discharge run-off location

☐ Run-on location

☐ ATS discharge location

☐ Non-visible pollutant location

☐ 3 samples per day:

☐ Sample 1 ☐ Sample 2 ☐ Sample 3

Time: Time: Time:

Effluent Sampled for:

☐ pH

☐ Turbidity

☐ Any additional parameters for which monitoring is required by the Regional Water Board:

____

____

____

____

Who collected the sample? Name, company, phone number? Rain gauge readings?

Name: ____________________________

Company: ____________________________

Phone Number ____________________________

Who collected the sample? Name, company, phone number? Rain gauge readings?

Name: ____________________________

Company: ____________________________

Phone Number ____________________________

Who collected the sample? Name, company, phone number? Rain gauge readings?

Name: ____________________________

Company: ____________________________

Phone Number ____________________________

Who collected the sample? Name, company, phone number? Rain gauge readings?

Name:

Company:

Phone Number

For Monitoring Location:

		Sampler Name	Time Sample Taken	Results	Daily Average	Was there an NAL Exceedance (Y[1] / N[2])	Was there an NEL Violation (Y/N)[3]
pH	1st Sample						
	2nd Sample						
	3rd Sample						
Turbidity	1st Sample						
	2nd Sample						
	3rd Sample						
SSC							

[1] Refer to Appendix X.6 for required action.
[2] No further action required.
[3] Refer to Appendix X.7 for required action.

SECONDARY CONTAINMENT AND SPILL KIT INVENTORY
(Store Completed Form in Appendix XVIII)

To be completed by the QSP

- Equipment and materials for cleanup of spills shall be available on site and spills and leaks shall be cleaned up ***immediately*** and the materials used to clean up the spills shall be disposed of properly; and
- Ensure appropriate spill response personnel are assigned and trained.
- Ensure the containment of washout areas that may contain additional pollutants so that there is no discharge into the underlying soil and/or surrounding areas.

The following spill control equipment can be found on-site:

No. of Spill Kits on Site	Contents of Spill Kits	Location of Spill Kit	Absorbent Capacity of Spill Kit (Gallons)

Note: Spill response kits come from a variety of suppliers. Kit contents and absorbent capacity may vary from supplier's description. Spill Kit contents should be inspected weekly.

The following secondary containment equipment can be found on-site:

Description of Material Stored in Secondary Containment (e.g., oil, paint, lubricant, etc.)	Location of Secondary Containment	Type of Containment/Enclosure (e.g., poly-pack, poly-pallet, Visqueen lined sump)	Volume Capacity	
			Maximum Storage/ Containment Capacity	Spill Potential (Quantity of Material)

INSPECTION FORM
(Store Completed Form in Appendix IX)

WDID Number	
Date of Inspection	
Date Inspection Report was Written	
Name of QSP or Inspector trained by QSP	
Inspector's Company/Title	
Inspector's Signature	
Inspection Type	☐ Weekly ☐ 24 Hour Interval During Extended Storm Events

Date storm began:

Duration of Storm :

Rainfall Amount (inches):

Precipitation: ☐ Present ☐ Absent

Time elapsed since last storm (hours or days) _______________

Is the site safely accessible during inclement weather?

☐ YES ☐ NO

If yes, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls.

If no, explain why it was not accessible.

If no, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

Is a site map attached that supplements this inspection form?

☐ YES ☐ NO

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs
BMP-1-02	Silt Fence	☐
BMP-1-03	Fiber Rolls	☐
BMP-1-04	Gravel Bag Berm	☐
BMP-1-05	Sand Bag Barrier	☐
BMP-1-06	Storm Drain Inlet Protection	☐
BMP-1-07	Tracking Controls	☐
BMP-1-08	Stockpile Management	☐
BMP-2-01	Material Delivery and Storage	☐
BMP-2-02	Material Use	☐
BMP-2-03	Spill Control	☐
BMP-2-04	Solid Waste Management	☐
BMP-2-05	Hazardous Materials/Waste Management	☐
BMP-2-06	Contaminated Soil Management	☐
BMP-2-07	Sanitary/Septic Waste Management	☐
BMP-2-08	Liquid Waste Management	☐
BMP-3-01	Dewatering Operations	☐
BMP-3-02	Paving Operations	☐
BMP-3-03	Vehicle and Equipment Washing	☐
BMP-3-04	Vehicle and Equipment Fueling	☐
BMP-3-05	Concrete/Coring/Saw Cutting and Drilling Waste Management	☐
BMP-3-06	Dewatering Utility Substructures and Vaults	☐
BMP-3-07	Vegetation Management including Mechanical and Chemical Weed Control	☐
BMP-3-08	Over-Water Protection	☐
BMP-3-09	Removal of Utility Location/Mark-Out Paint	☐

BMP-4-01	Preservation of Existing Vegetation	☐
BMP-4-02	Temporary Soil Stabilization	☐
BMP-4-03	Hydraulic Mulch	☐
BMP-4-04	Hydroseeding	☐
BMP-4-05	Soil Binders	☐
BMP-4-06	Straw Mulch	☐
BMP-4-07	Geotextiles, Plastic Covers and Erosion Control Blankets/Mats	☐
BMP-4-08	Dust (Wind Erosion) Control	☐
CASQA EC-10	Velocity Dissipation Devices	☐
CASQA EC-12	Streambank Stabilization	☐
CASQA NS-4	Temporary Stream Crossing	☐
CASQA NS-5	Clear Water Diversion	☐

Site Information		
Current stage of construction (check which applies)	☐ Grading and Land Development Phase ☐ Streets and Utilities Phase ☐ Inactive Construction	☐ Final Landscaping and Site Stabilization ☐ Vertical Construction Phase
Activities completed:		
Approximate area of the site exposed (in acres):		

Review and update (as applicable) the QSP Implementation Checklist in Appendix VII. Based on a review of this checklist and an evaluation of BMPs on-site complete the following:

Inspected the site for good site management (i.e., "housekeeping") measures implemented for Construction Materials		
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)?	☐Yes*	☐No
*If yes, describe the deficiency:		

Describe any BMP Corrective Actions..	
Date	BMP Corrective Action Taken
Date	
Date	
Date	

Inspected the site for good site management (i.e., "housekeeping") measures implemented for Waste Management:		
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)?	☐Yes*	☐No
`*If yes, describe below:		

Describe any BMP Corrective Actions.	
Date	BMP Corrective Action Taken
Date	
Date	
Date	

Inspected the site for good site management (i.e., "housekeeping") measures implemented for Vehicle Storage and Maintenance:	
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)?	☐Yes* ☐No
*If yes, describe below:	
Date	BMP Corrective Action Taken
Date	
Date	
Date	

Inspected the site for good site management (i.e., "housekeeping") measures implemented for Landscape Materials:		
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)? *If yes, describe below:	☐Yes*	☐No
Date	BMP Corrective Action Taken	
Date		
Date		
Date		

Inspected the site for good site management (i.e., "housekeeping") measures implemented for Air Deposition:		
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)? *If yes, describe below:	☐ Yes*	☐ No

Date	BMP Corrective Action Taken
Date	
Date	
Date	

Inspected the site for good site management (i.e., "housekeeping") measures implemented for Non-Storm Water Discharges:		
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)? *If yes, describe below:	☐ Yes*	☐ No

Date	BMP Corrective Action Taken
Date	
Date	
Date	

Inspected the site for good site management (i.e., "housekeeping") measures implemented for <u>Erosion Control:</u>	☐Yes	☐No
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)? *If yes, describe below:	☐Yes*	☐No

Date	BMP Corrective Action Taken
Date	
Date	
Date	

Inspected the site for good site management (i.e., "housekeeping") measures implemented for <u>Sediment Control:</u>	☐Yes	☐No
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)? *If yes, describe below:	☐Yes*	☐No
Describe any BMP Corrective Actions.. ☐ ☐ ☐ ☐		

Inspected the site for good site management (i.e., "housekeeping") measures implemented for Run-on and Runoff Controls:	☐Yes	☐No
Were any BMP deficiencies observed (i.e., BMPs requiring maintenance and repair)? *If yes, describe below:	☐Yes*	☐No
Describe any BMP Corrective Actions. ☐ ☐ ☐ ☐		

List any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates:

Report the presence of noticeable odors/visible sheen on the surface of any discharges immediately to _______ (Title)____________________ at ____________________________ and document observations below:

Were photographs taken during the inspection? ☐Yes ☐No
If yes, attach to this site inspection.

ORIGINAL - MAKE COPIES

SWPPP AMENDMENT LOG
(Store Completed Forms in Appendix XVI)

DATE:	BY:	DESCRIPTION:

SWPPP INFORMATION REQUEST FORM (Store Completed Form in Appendix IV)

Number of SWPPP Copies Needed:___________________________

Project Information

Project Name (exact project name to call SWPPP)

____

Project ID/Work Order/Contract Number/Request Number (if applicable)

____

____

____

Company Contact to Return SWPPP to at job completion

Company Name and Division: ______________________________
Street Address: ______________________________
City, State, Zip Code: ______________________________
Contact Person: ______________________________
Contact Title: ______________________________
Phone Number: ______________________________
Emergency Phone Number: ______________________________

Owner Information (Legally Responsible Person (LRP))

Owner Company Name: ______________________________
Street Address: ______________________________
City, State, Zip Code: ______________________________
LRP: ______________________________
LRP: ______________________________
Phone Number: ______________________________
Emergency Phone Number: ______________________________

Approved Signatory

Company Name: ______________________________
Street Address: ______________________________
City, State, Zip Code: ______________________________

Contact Person: ______________________

Contact Title: ______________________

Phone Number: ______________________

Emergency Phone Number: ______________________

Qualified SWPPP Developer (QSD) Responsible for Preparation of SWPPP

QSD's Company Name: ______________________

Street Address: ______________________

City, State, Zip Code: ______________________

QSD (first and last name): ______________________

Type of Certification and Certification Number: ______________________

Phone Number: ______________________

Emergency Phone Number: ______________________

Qualified SWPPP Developer (QSD) Subsequent to SWPPP Preparation

QSD's Company Name: ______________________

Street Address: ______________________

City, State, Zip Code: ______________________

QSD (first and last name): ______________________

Type of Certification and Certification Number: ______________________

Phone Number: ______________________

Emergency Phone Number: ______________________

Qualified SWPPP Practitioner (QSP)

QSP's Company Name: ______________________

Street Address: ______________________

City, State, Zip Code: ______________________

Name of QSP: ______________________

Type of Certification and Certification Number: ______________________

Phone Number: ______________________

Emergency Phone Number: ______________________

Contractor Information

Contractor Company Name: ______________________

Street Address: ______________________

City, State, Zip Code: ________________

Contractor Contact Name: ________________

Contractor's Title: ________________

Phone Number: ________________

Emergency Phone Number: ________________

Storm Water Sampling Agent Information

Sampling Company Name: ________________

Street Address: ________________

City, State, Zip Code: ________________

Contact Name: ________________

Sampler's Title: ________________

Phone Number: ________________

Emergency Phone Number: ________________

Site Information

Site Contact Person: ________________

Phone Number: ________________

Emergency Phone Number: ________________

Project Description

____

____

____

- Type of Construction: (Check all that apply)

□ Residential	□ Industrial	□ Transportation
□ Commercial	□. Development	□ Utility

□ Other: ________________________

- Which of the following phases of construction are applicable to the project?

□ Grading and Land Development Phase

□ Streets and Utilities Phase

□ Vertical Construction Phase

□ Post-Construction Phase

□ Inactive Construction Phase

□ Streets and Utilities Phase

Project Location

____

____

____

____

- Longitude and Latitude coordinates of project

____

- Thomas Brothers Guide location of project (year and page number(s))

____

- Construction Commencement date:______________________________

  % of construction site perimeter to be mass graded: ____

- Complete grading date: ______________________________

- Completion project date: ______________________________

  Percent Impervious Before and After Construction: ______________

- Runoff Coefficient Before and After Construction ______________

- Number of acres to be disturbed as a result of the project

  Onsite Acreage: ______________________________

  Offsite Acreage: ______________________________

- Is this project part of a larger common plan of development? If so, please provide the name of the development.

____

- Number of acres to be left undisturbed (natural habitat) within the construction site perimeter defined above.

- Determine the nearest rain gage

  (See http://www.cnrfc.noaa.gov/precipMaps.php?group=san&hour=24&synoptic=9):

  ____

- Name of closest Receiving Water. See http://bios.dfg.ca.gov/

  ____

- Does the project drain to an Area of Special Biological Significance (ASBS) pursuant to the Ocean Plan? ☐ Yes ☐ No

- List receiving water impairments.

  ____

- Has setback distances been incorporated into the project design? ☐ Yes ☐ No
- If yes, please explain and provide an exhibit showing these setbacks.

  ____

- Is the receiving water listed as a Beneficial Use for COLD, SPAWN and MIGRATORY? ☐ Yes ☐ No

- What Regional Board Jurisdiction does the project reside in?

  ____

- Has a Drainage Study been prepared for the project? ☐ Yes ☐ No
  If yes, please provide a copy of the Drainage Study (please make sure that the drainage maps are attached/included in the report).

- Provide the discharges (and provide the storm event that the discharges are associated with, i.e., Q50 for 50-year storm event) for run-on (off-site area draining onto construction site), if any. Provide an exhibit that shows where all run-on locations occur.

  ____

  ____

- Has a Water Quality Technical Report (report addressing post-construction best management practices (BMPs)) been prepared? ☐ Yes ☐ No

  If yes, please provide a copy of the report. If not, does the project resides in an area where a Phase I or Phase II Storm Water Management Plan has been approved. Discuss how to address Appendix 4 of the Construction General Permit (CGP) with the owner of the property that the project is located.

- Describe what Post-Construction BMP are being implemented for this project (if applicable):

  Not Applicable: ____________________

  Landscape Plans: ____________________

  In-line Treatment: ____________________

  Bio Swale: ____________________

  Street Sweeping: ____________________

  Solid Waste Disposal: ____________________

  Controlled Use of Pesticides and Fertilizer: ____________________

  ____

  Homeowners Association: ____________________

  Other: ____________________

  ____

- Who is responsible for funding the Post-Construction BMPs both short and long term?

  ____

  ____

- Has a Spill Response and Implementation Procedure been prepared for the project?

  ☐ Yes ☐ No

- Are there any temporary Sediment Basins/Desilting Basins designed for the project?

  ☐ Yes ☐ No

  If yes, have the basins been designed in conformance with Appendix 2 of the CGP? ☐ Yes ☐ No If yes, please provide all supporting calculations, a map showing the location of the basins and the details of the basins. If the basins have not been designed in conformance with Appendix 2 of the CGP, please document below and consult with the person with the Company Environmental Specialist overseeing this SWPPP.

____

____

- Does the project propose using an Active Treatment System (ATS)?
  ☐ Yes ☐ No

Site History/Past Usage. Please provide a copy of the Phase I or Phase II Environmental Studies, if available. Have any environmental documents/studies been prepared for the project (such as California Environmental Quality Act (CEQA) or National Environmental Policy Act (NEPA). ☐ Yes ☐ No If yes, please provide a copy.

- If available, please provide copies of all Environmental Permits such as dewatering permits, demolition permits, CWA section 404 permit, CWA section 401 Water Quality Certification, and California Department of Fish and Game Code Section 1600.
  No other environmental permits have been obtained for this project.
  ____

- Are you or the owner of the land that the project resides on aware of any toxic materials known to be treated or stored at the site? (Example: the site was used to store large quantities of gasoline in underground tanks). ☐YES NO
  If yes, please explain (provide documentation):
  .
  ____

- Is the following statement true: The primary impacts of wind erosion (dust control) will be controlled through water application on main driving areas, construction of gravel access road entrance/exits, and limitation of off-road driving. ☐ YES ☐ NO

- Are there any existing buildings or roadways within the construction site? ☐ Yes ☐ No If yes, list what kind of buildings are they (commercial, residential, industrial) and list road names, if any.

  ____

  ____

- Do you have a Construction Activity Schedule for this project at this time?

  ☐ Yes ☐ No If yes, please attach a copy.

  Provide the information needed to access the construction drawings for the project.

  ____

- Have Erosion and Sediment Control Plans been prepared for the project?

  ☐Yes ☐ No If yes, please provide the name of the preparer of the report.

  ____

ORIGINAL - MAKE COPIES

SWPPP TRAINING AND QUALIFICATIONS LOG
(Store Completed Form in Appendix XV)

____

____

Training Location: ____________________________________

Trainer(s): ______________________________ **Date:** __________

TRAINING TOPICS COVERED

- ☐ Review and Discussion of SWPPP
- ☐ General BMPs for Site and Materials Management
- ☐ BMPs for Erosion and Sediment Control
- ☐ Spill or Release Response
- ☐ Proper Selection of BMPs
- ☐ Proper BMP Implementation/Maintenance Techniques
- ☐ Review and Discussion of SWPPP Inspection Requirements
- ☐ Review and Discussion of Sampling Requirements
- ☐ Sampling and Monitoring
- ☐ ATS (if applicable)
- ☐ Other: ____________________________

NAME	AREA OF RESPONSIBILITY	COMPANY NAME	PHONE NUMBER

NAME	AREA OF RESPONSIBILITY	COMPANY NAME	PHONE NUMBER

Qualified SWPPP Developer (QSD) Qualifications

I, ___________________________, am a Qualified SWPPP Developer (QSD) and hold the following registration(s) and/or certification(s). (Check all that apply and include a copy of the registration(s) and/or certification(s)):

- ☐ A California registered professional civil engineer;
- ☐ A California registered professional geologist or engineering geologist;
- ☐ A California registered landscape architect;
- ☐ A professional hydrologist registered through the American Institute of Hydrology;
- ☐ A Certified Professional in Erosion and Sediment Control (CPESC)™ registered through EnviroCert, International, Inc.;
- ☐ A Certified Professional in Storm Water Quality (CPSWQ) ™ registered through EnviroCert, International, Inc.; or
- ☐ A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

-- AND --

The QSD attended formal State Water Board sponsored or approved QSD training course on the following date (a requirement as of September 1, 2011):

Date: ____

Name of Course: ____

Presented by: ____

A copy of the certification of attendance is attached.

Signature:___________________________________

Affix Certificate Number and/or Seal here:

Certificate Number___________________________

Seal:

Qualified SWPPP Practitioner (QSP) Qualifications

I, ____________________________, am a Qualified SWPPP Practitioner (QSP)* and hold the following registration(s) and/or certification(s). (Check all that apply and include a copy of the registration(s) and/or certification(s):

- ☐ Qualified SWPPP Developer (QSD); or
- ☐ A certified erosion, sediment and storm water inspector registered through Enviro Cert, International, Inc.; or
- ☐ A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

* As of September 2, 2011, the QSP shall be either a QSD or have one of the above certifications:

-- AND --

The QSP attended formal State Water Board sponsored or approved QSP training course on the following date (a requirement as of September 1, 2011):

Date: ______________________________

Name of Course: ______________________________

Presented by: ______________________________

A copy of the certification of attendance is attached.

Signature:____________________________________

Affix Certificate Number and/or Seal here:

Certificate Number___________________________

Seal:

VISUAL OBSERVATION (INSPECTION) FORM FOR A QUALIFYING RAIN EVENT

(Store Complete Forms in Appendix XI.G)

Use one form for each discharge location

WDID Number ______________________________

Inspection Location/Ref # (Identify locations on site map) ______________________________

Date and Time of Inspection ______________________________

Current Weather Conditions ______________________________

Name of Inspector ______________________________

Inspector’s Company/Title ______________________________

QSP’s Signature ______________________________

Inspection Type

☐ 48 hours prior to qualifying rain event

☐ Post-Rain (within 48 hours after a qualifying rain event)

☐ Stored or contained storm water being discharged that is derived from and discharged subsequent to a qualifying rain event producing ½ inch or more at the time of discharge

☐ Other:

Storm Event Date ______________________________

Site Rain Gauge Reading at Time of Inspection: ______________________________

NOAA Rain Gauge Reading at Time of Inspection: ______________________________

NOAA Rain Gauge ID ______________________________

Inspection Observations

Are there any spills, leaks, or uncontrolled pollutant sources?

☐Yes If yes, describe below ☐No

I ______________________________

____

____

Are BMPs properly implemented in accordance with the SWPPP/REAP? ☐Yes ☐No If no, describe implemented corrective actions below with date implemented

Do any storm water storage and containment areas have leaks? ☐Yes ☐No If yes, describe below Is there adequate freeboard? ☐Yes ☐No

Are BMPs were adequately designed, implemented, and effective? ☐Yes ☐No

Inspect all discharge locations. If any of the characteristics are observed, describe the conditions and discharge location(s) below.

Storm Water Characteristics	
Characteristic	Observation (Circle applicable response)
Discolorations?	None Brown Gray Yellow Red Other___________
Turbidity?	None Cloudy Opaque
Floating or Suspended Materials?	None Vegetation Mulch Trash Foam Other______________
Sheen?	None Slight Heavy
Odor?	
Any observed pollutants? Possible sources?	None Sewage Other________________

Description of discharge conditions and location:

Is there a need for any additional BMPs? If so, describe below and inform the QSD that the SWPPP needs to be revised.

I notified the QSD of these changes on ______________(date).

VISUAL OBSERVATION (INSPECTION) FORM FOR NON-STORM WATER DISCHARGES
(Store the Completed Form in Appendix XI.B)

Inspect each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources

Project Name ______________________

WDID Number: ______________________

Date and Time of Inspection ______________________

Current Weather Conditions ______________________

Name of Inspector ______________________

Inspector's Company/Title ______________________

QSP's Signature ______________________

This Visual observation serves as the quarterly inspection for the following quarter (check which is applicable):

☐ January – March ☐ April - June ☐ July – September ☐ October – December

☐ 2014 ☐ 2015 ☐ 2016 ☐ 2017

A visual observation (inspection) must document the presence or evidence of any non-storm water discharge (authorized or unauthorized).

Were any of these discharges observed at the time of the inspection?

☐YES ☐ NO

If yes, describe the discharge, their source(s) and response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-sw discharges

____

____

____

____

____

____

Non-Storm Pollutant Water Characteristics	
Characteristic	**Observation (Circle one)**
Discolorations	Clear Brown Gray Yellow Red Other___________
Turbidity	Clear Cloudy Opaque
Floating or Suspended Materials?	None Vegetation Mulch Trash Foam Other______________
Sheen	None Slight Heavy
Odor	None Noticeable
Any observed pollutants?	None Sewage Other________________
Possible sources?	

Were samples collected?

☐ YES* ☐ NO If no, provide an explanation ____

If yes, refer to Appendix X for sampling information.

APPENDIX II:

COPY OF CONSTRUCTION GENERAL PERMIT

Linda S. Adams
Secretary for Environmental Protection

State Water Resources Control Board

Arnold Schwarzenegger
Governor

Division of Water Quality
1001 I Street • Sacramento, California 95814 • (916) 341-5455
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100
Fax (916) 341-5463 • http://www.waterboards.ca.gov

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE
ACTIVITIES

ORDER NO. 2009-0009-DWQ
NPDES NO**. CAS000002**

This Order was adopted by the State Water Resources Control Board on:	**September 2, 2009**
This Order shall become effective on:	**July 1, 2010**
This Order shall expire on:	**September 2, 2014**

IT IS HEREBY ORDERED, that this Order supersedes Order No. 99-08-DWQ [as amended by Order No. 2010-0014-DWQ] except for enforcement purposes. The Discharger shall comply with the requirements in this Order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on September 2, 2009.

AYE: Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: Chairman Charles R. Hoppin

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

Linda S. Adams
Secretary for Environmental Protection

State Water Resources Control Board

Arnold Schwarzenegger
Governor

Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5455
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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2010-0014-DWQ
NPDES NO. CAS000002

Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:	**September 2, 2009**
Order No. 2009-0009-DWQ became effective on:	**July 1, 2010**
Order No. 2009-0009-DWQ shall expire on:	**September 2, 2014**
This Order, which amends Order No. 2009-0009-DWQ, was adopted by the State Water Resources Control Board on:	**November 16, 2010**
This Order shall become effective on:	**February 14, 2011**

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in red-strikeout text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-0009-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on **November 16, 2010.**

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for Environmental Protection

State Water Resources Control Board

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2012-0006-DWQ
NPDES NO**. CAS000002**

Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:	**September 2, 2009**
Order No. 2009-0009-DWQ became effective on:	**July 1, 2010**
Order No. 2010-0014-DWQ became effective on:	**February 14, 2011**
Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ shall expire on:	**September 2, 2014**
This Order, which amends Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ, was adopted by the State Water Resources Control Board on:	**July 17, 2012**
This Order No. 2012-0006-DWQ shall become effective on:	**July 17, 2012**

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in red-strikeout text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-000-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on July 17, 2012.

AYE:	Chairman Charles R. Hoppin Vice Chair Frances Spivy-Weber Board Member Tam M. Doduc Board Member Steven Moore Board Member Felicia Marcus
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

List of Documents included in this single file saved in pdf format on March 25, 2014:

- Fact Sheet
- Order
- Attachment A – Linear Underground/Overhead Requirements
- Attachment A.1 – LUP Project Type Determination
- Attachment A.2 – LUP Permit Registration Documents
- Attachment B – Permit Registration Documents
- Attachment C – Risk Level 1 Requirements
- Attachment D – Risk Level 2 Requirements
- Attachment E – Risk Level 3 Requirements
- Attachment F – Active Treatment System Requirements
- Appendix 1 – Risk Determination Worksheet and Sediment-related 303d List
- Appendix 2 – Post-Construction Water Balance
- Appendix 2.1 – Post-Construction Water Balance Calculator
- Appendix 3 - Bioassessment Monitoring Guidelines
- Appendix 4 – Adopted/Implemented Sediment and Non-sediment TMDLs
- Appendix 5 – Glossary
- Appendix 6 - Acronym List
- Appendix 7 – State and Regional Water Board Contacts

State Water Resources Control Board
Division of Water Quality
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Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

CONSTRUCTION GENERAL PERMIT FACT SHEET TABLE OF CONTENTS

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I. BACKGROUND

A. History

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the CWA added Section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that established storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water to waters of the United States from construction projects that encompass five or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. Regulations (Phase II Rule) that became final on December 8, 1999 lowered the permitting threshold from five acres to one acre.

While federal regulations allow two permitting options for storm water discharges (Individual Permits and General Permits), the State Water Board has elected to adopt only one statewide General Permit at this time that will apply to most storm water discharges associated with construction activity.

On August 19, 1999, the State Water Board reissued the General Construction Storm Water Permit (Water Quality Order 99-08-DWQ). On December 8, 1999 the State Water Board amended Order 99-08-DWQ to apply to sites as small as one acre.

The General Permit accompanying this fact sheet regulates storm water runoff from construction sites. Regulating many storm water discharges under one permit will greatly reduce the administrative burden associated with permitting individual storm water discharges. To obtain coverage under this General Permit, dischargers shall electronically file the Permit Registration Documents (PRDs), which includes a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other compliance related documents required by this General Permit and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Quality Control Boards (Regional Water Boards) may issue General Permits or Individual Permits containing more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers.

B. Legal Challenges and Court Decisions

1. Early Court Decisions

Shortly after the passage of the CWA, the USEPA promulgated regulations exempting most storm water discharges from the NPDES permit requirements. (See 40 C.F.R. § 125.4 (1975); see also *Natural Resources Defense Council v. Costle* (D.C. Cir. 1977) 568 F.2d 1369, 1372 (*Costle*); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1163 (*Defenders of Wildlife*).) When environmental groups challenged this exemption in federal court, the District of Columbia Court of Appeals invalidated the regulation, holding that the USEPA “does not have authority to exempt categories of point sources from the permit requirements of [CWA] § 402.” (*Costle*, 568 F.2d at 1377.) The *Costle* court rejected the USEPA's argument that effluent-based storm sewer regulation was administratively infeasible because of the variable nature of storm water pollution and the number of affected storm sewers throughout the country. (*Id.* at 1377-82.) Although the court acknowledged the practical problems relating to storm sewer regulation, the court found the USEPA had the flexibility under the CWA to design regulations that would overcome these problems. (*Id.* at 1379-83.) In particular, the court pointed to general permits and permits based on requiring best management practices (BMPs).

During the next 15 years, the USEPA made numerous attempts to reconcile the statutory requirement of point source regulation with the practical problem of regulating possibly millions of diverse point source discharges of storm water. (See *Defenders of Wildlife*, 191 F.3d at 1163; see also Gallagher, Clean Water Act in Environmental Law Handbook (Sullivan, edit., 2003)
p. 300 (Environmental Law Handbook); Eisen, *Toward a Sustainable Urbanism: Lessons from Federal Regulation of Urban Storm Water Runoff* (1995) 48 Wash. U.J. Urb. & Contemp. L.1, 40-41 [Regulation of Urban Storm Water Runoff].)

In 1987, Congress amended the CWA to require NPDES permits for storm water discharges. (See CWA § 402(p), 33 U.S.C. § 1342(p); *Defenders of Wildlife,* 191 F.3d at 1163; *Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1296.) In these amendments, enacted as part of the Water Quality Act of 1987, Congress distinguished between industrial and municipal storm water discharges. With respect to industrial storm water discharges, Congress provided that NPDES permits "shall meet all applicable provisions of this section and section 1311 [requiring the USEPA to establish effluent limitations under specific timetables]." (CWA § 402(p)(3)(A), 33 U.S.C. § 1342(p)(3)(A); see also *Defenders of Wildlife,* 191 F.3d at 1163-64.)

In 1990, USEPA adopted regulations specifying what activities were considered "industrial" and thus required discharges of storm water associated with those activities to obtain coverage under NPDES permits. (55 Fed. Reg. 47,990 (1990); 40 C.F.R. § 122.26(b)(14).) Construction activities, deemed a subset of the industrial activities category, must also be regulated by an NPDES permit. (40 C.F.R. § 122.26(b)(14)(x)). In 1999, USEPA issued regulations for "Phase II" of storm water regulation, which required most small construction sites (1-5 acres) to be regulated under the NPDES program. (64 Fed. Reg. 68,722; 40 C.F.R. § 122.26(b)(15)(i).)

2. **Court Decisions on Public Participation**

Two recent federal court opinions have vacated USEPA rules that denied meaningful public review of NPDES permit conditions. On January 14, 2003, the Ninth Circuit Court of Appeals held that certain aspects of USEPA's Phase II regulations governing MS4s were invalid primarily because the general permit did not contain express requirements for public participation. (*Environmental Defense Center v. USEPA* (9th Cir. 2003) 344 F.3d 832.) Specifically, the court determined that applications for general permit coverage (including the Notice of Intent (NOI) and Storm Water Management Program (SWMP)) must be made available to the public, the applications must be reviewed and determined to meet the applicable standard by the permitting authority before coverage commences, and there must be a process to accommodate public hearings. (*Id.* at 852-54.) Similarly, on February 28, 2005, the Second Circuit Court of Appeals held that the USEPA's confined animal feeding operation (CAFO) rule violated the CWA because it allowed dischargers to write their own nutrient management plans without public review. (*Waterkeeper Alliance v. USEPA* (2d Cir. 2005) 399 F.3d 486.) Although neither decision involved the issuance of construction storm water permits, the State Water Board's Office of Chief Counsel has recommended that the new General Permit address the courts' rulings where feasible[1].

---

[1] In *Texas Independent Producers and Royalty Owners Assn. v. USEPA* (7th Cir. 2005) 410 F.3d 964, the Seventh Circuit Court of Appeals held that the USEPA's construction general permit was not required to provide the public with the opportunity for a public hearing on the Notice of Intent or Storm Water Pollution Prevention Plan. The Seventh Circuit briefly discussed why it agreed with the Ninth Circuit's dissent in *Environmental Defense Center*, but

The CWA and the USEPA's regulations provide states with the discretion to formulate permit terms, including specifying best management practices (BMPs), to achieve strict compliance with federal technology-based and water quality-based standards. (*Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) Accordingly, this General Permit has developed specific BMPs as well as numeric action levels (NALs) in order to achieve these minimum federal standards. In addition, the General Permit requires a SWPPP and REAP (another dynamic, site-specific plan) to be developed but has removed all language requiring the discharger to implement these plans – instead, the discharger is required to comply with specific requirements. By requiring the dischargers to implement these specific BMPs and NALs, this General Permit ensures that the dischargers do not "write their own permits." As a result this General Permit does not require each discharger's SWPPP and REAP to be reviewed and approved by the Regional Water Boards.

This General Permit also requires dischargers to electronically file all permit-related compliance documents. These documents include, but are not limited to, NOIs, SWPPPs, annual reports, Notice of Terminations (NOTs), and numeric action level (NAL) exceedance reports. Electronically submitted compliance information is immediately available to the public, as well as the Regional Water Quality Control Board (Regional Water Board) offices, via the Internet. In addition, this General Permit enables public review and hearings on permit applications when appropriate. Under this General Permit, the public clearly has a meaningful opportunity to participate in the permitting process.

---

generally did not discuss the substantive holdings in *Environmental Defense Center* and *Waterkeeper Alliance*, because neither court addressed the initial question of whether the plaintiffs had standing to challenge the permits at issue. However, notwithstanding the Seventh Circuit's decision, it is not binding or controlling on the State Water Board because California is located within the Ninth Circuit.

C. Blue Ribbon Panel of Experts and Feasibility of Numeric Effluent Limitations

In 2005 and 2006, the State Water Board convened an expert panel (panel) to address the feasibility of numeric effluent limitations (NELs) in California's storm water permits. Specifically, the panel was asked to address:

"Is it technically feasible to establish numeric effluent limitations, or some other quantifiable limit, for inclusion in storm water permits? How would such limitations or criteria be established, and what information and data would be required?"

"The answers should address industrial general permits, construction general permits, and area-wide municipal permits. The answers should also address both technology-based limitations or criteria and water quality-based limitations or criteria. In evaluating establishment of any objective criteria, the panel should address all of the following:

The ability of the State Water Board to establish appropriate objective limitations or criteria;

How compliance determinations would be made;

The ability of dischargers and inspectors to monitor for compliance; and

The technical and financial ability of dischargers to comply with the limitations or criteria."

Through a series of public participation processes (State Water Board meetings, State Water Board workshops, and the solicitation of written comments), a number of water quality, public process and overall program effectiveness problems were identified. Some of these problems are addressed through this General Permit.

D. Summary of Panel Findings on Construction Activities

The panel's final report can be downloaded and viewed through links at www.waterboards.ca.gov or by clicking here[2].

The panel made the following observations:

"Limited field studies indicate that traditional erosion and sediment controls are highly variable in performance, resulting in highly variable turbidity levels in the site discharge."

"Site-to-site variability in runoff turbidity from undeveloped sites can also be quite large in many areas of California, particularly in more arid regions with less natural vegetative cover and steep slopes."

---

[2] http://www.waterboards.ca.gov/stormwtr/docs/numeric/swpanel_final_report.pdf

“Active treatment technologies involving the use of polymers with relatively large storage systems now exist that can provide much more consistent and very low discharge turbidity. However, these technologies have as yet only been applied to larger construction sites, generally five acres or greater. Furthermore, toxicity has been observed at some locations, although at the vast majority of sites, toxicity has not occurred. There is also the potential for an accidental large release of such chemicals with their use.”

“To date most of the construction permits have focused on TSS and turbidity, but have not addressed other, potentially significant pollutants such as phosphorus and an assortment of chemicals used at construction sites.”

“Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors.”

“The quality of storm water discharges from construction sites that effectively employ BMPs likely varies due to site conditions such as climate, soil, and topography.”

“The States of Oregon and Washington have recently adopted similar concepts to the Action Levels described earlier.”

In addition, the panel made the following conclusions:

“It is the consensus of the Panel that active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with storm water discharges from construction sites (e.g. TSS and turbidity) for larger construction sites. Technical practicalities and cost-effectiveness may make these technologies less feasible for smaller sites, including small drainages within a larger site, as these technologies have seen limited use at small construction sites. If chemical addition is not permitted, then Numeric Limits are not likely feasible.”

“The Board should consider Numeric Limits or Action Levels for other pollutants of relevance to construction sites, but in particular pH. It is of particular concern where fresh concrete or wash water from cement mixers/equipment is exposed to storm water.”

“The Board should consider the phased implementation of Numeric Limits and Action Levels, commensurate with the capacity of the dischargers and support industry to respond.”

E. How the Panel’s Findings are Used in this General Permit

The State Water Board carefully considered the findings of the panel and related public comments. The State Water Board also reviewed and considered the comments regarding statewide storm water policy and the reissuance of the Industrial General Permit. From the input received the State Water Board identified some permit and program performance gaps that are addressed in this General Permit. The Summary of Significant Changes (below) in this General Permit are a direct result of this process.

F. Summary of Significant Changes in This General Permit

The State Water Board has significant changes to Order 99-08-DWQ. This General Permit differs from Order 99-08-DWQ in the following significant ways:

Rainfall Erosivity Waiver: this General Permit includes the option allowing a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for their site's given location and time frame compute to be less than or equal to 5.

Technology-Based Numeric Action Levels: this General Permit includes NALs for pH and turbidity.

Risk-Based Permitting Approach: this General Permit establishes three levels of risk possible for a construction site. Risk is calculated in two parts: 1) Project Sediment Risk, and 2) Receiving Water Risk.

Minimum Requirements Specified: this General Permit imposes more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.

Project Site Soil Characteristics Monitoring and Reporting: this General Permit provides the option for dischargers to monitor and report the soil characteristics at their project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.

Effluent Monitoring and Reporting: this General Permit requires effluent monitoring and reporting for pH and turbidity in storm water discharges. The purpose of this monitoring is to evaluate whether NALs and NELs for Active Treatment Systems included in this General Permit are exceeded.

Receiving Water Monitoring and Reporting: this General Permit requires some Risk Level 3 and LUP Type 3 dischargers to monitor receiving waters and conduct bioassessments.

Post-Construction Storm Water Performance Standards: this General Permit specifies runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 NPDES permit, to avoid, minimize and/or mitigate post-construction storm water runoff impacts.

Rain Event Action Plan: this General Permit requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

Annual Reporting: this General Permit requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and pubic information.

Certification/Training Requirements for Key Project Personnel: this General Permit requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.

Linear Underground/Overhead Projects: this General Permit includes requirements for all Linear Underground/Overhead Projects (LUPs).

II. RATIONALE

A. General Permit Approach

A general permit for construction activities is an appropriate permitting approach for the following reasons:

1. A general permit is an efficient method to establish the essential regulatory requirements for a broad range of construction activities under differing site conditions;

2. A general permit is the most efficient method to handle the large number of construction storm water permit applications;

3. The application process for coverage under a general permit is far less onerous than that for individual permit and hence more cost effective;

4. A general permit is consistent with USEPA's four-tier permitting strategy, the purpose of which is to use the flexibility provided by the CWA in designing a workable and efficient permitting system; and

5. A general permit is designed to provide coverage for a group of related facilities or operations of a specific industry type or group of industries. It is appropriate when the discharge characteristics are sufficiently similar, and a standard set of permit requirements can effectively provide environmental protection and comply with water quality standards for discharges. In most cases, the general permit will provide sufficient and appropriate management requirements to protect the quality of receiving waters from discharges of storm water from construction sites.

There may be instances where a general permit is not appropriate for a specific construction project. A Regional Water Board may require any discharger otherwise covered under the General Permit to apply for and obtain an Individual Permit or apply for coverage under a more specific General Permit. The Regional Water Board must determine that this General Permit does not provide adequate assurance that water quality will be protected, or that there is a site-specific reason why an individual permit should be required.

B. Construction Activities Covered

1. **Construction activity subject to this General Permit:**

Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or sale of one or more acres of disturbed land surface.

Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to USEPA regulations, such as dairy barns or food processing facilities.

Construction activity associated with LUPs including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.[3]

Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction[4] (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction projects that intend to disturb one or more acres of land within the jurisdictional boundaries of a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the project.

2. Linear Underground/Overhead Projects (LUPs) subject to this General Permit:

Underground/overhead facilities typically constructed as LUPs include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Water Quality Order 2003-0007-DWQ regulated construction activities associated with small LUPs that resulted in land disturbances greater than one acre, but less than five acres. These projects were considered non-traditional construction projects. Attachment A of this Order now regulates all construction activities from LUPs resulting in land disturbances greater than one acre.

3. Common Plan of Development or Sale

USEPA regulations include the term “common plan of development or sale” to ensure that acreage within a common project does not artificially escape the permit requirements because construction activities are phased, split among smaller parcels, or completed by different owners/developers. In the absence of an

[3] Pursuant to the Ninth Circuit Court of Appeals’ decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the USEPA’s petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

[4] A construction site that includes a dredge and/or fill discharge to any water of the United States (e.g., wetland, channel, pond, or marine water) requires a CWA Section 404 permit from the U.S. Army Corps of Engineers and a CWA Section 401 Water Quality Certification from the Regional Water Board or State Water Board.

exact definition of “common plan of development or sale,” the State Water Board is required to exercise its regulatory discretion in providing a common sense interpretation of the term as it applies to construction projects and permit coverage. An overbroad interpretation of the term would render meaningless the clear “one acre” federal permitting threshold and would potentially trigger permitting of almost any construction activity that occurs within an area that had previously received area-wide utility or road improvements.

Construction projects generally receive grading and/or building permits (Local Permits) from local authorities prior to initiating construction activity. These Local Permits spell out the scope of the project, the parcels involved, the type of construction approved, etc. Referring to the Local Permit helps define “common plan of development or sale.” In cases such as tract home development, a Local Permit will include all phases of the construction project including rough grading, utility and road installation, and vertical construction. All construction activities approved in the Local Permit are part of the common plan and must remain under the General Permit until construction is completed. For custom home construction, Local Permits typically only approve vertical construction as the rough grading, utilities, and road improvements were already independently completed under the a previous Local Permit. In the case of a custom home site, the homeowner must submit plans and obtain a distinct and separate Local Permit from the local authority in order to proceed. It is not the intent of the State Water Board to require permitting for an individual homeowner building a custom home on a private lot of less than one acre if it is subject to a separate Local Permit. Similarly, the installation of a swimming pool, deck, or landscaping that disturbs less than one acre that was not part of any previous Local Permit are not required to be permitted.

The following are several examples of construction activity of less than one acre that would require permit coverage:

a. A landowner receives a building permit(s) to build tract homes on a 100-acre site split into 200 one-third acre parcels, (the remaining acreage consists of streets and parkways) which are sold to individual homeowners as they are completed. The landowner completes and sells all the parcels except for two. Although the remaining two parcels combined are less than one acre, the landowner must continue permit coverage for the two parcels.

b. One of the parcels discussed above is sold to another owner who intends to complete the construction as already approved in the Local Permit. The new landowner must file Permit Registration Documents (PRDs) to complete the construction even if the new landowner is required to obtain a separate Local Permit.

c. Landowner in (1) above purchases 50 additional one half-acre parcels adjacent to the original 200-acre project. The landowner seeks a Local Permit (or amendment to existing Local permit) to build on 20 parcels while leaving the remaining 30 parcels for future development. The landowner must amend PRDs to include the 20 parcels 14 days prior to commencement of construction activity on those parcels.

C. Construction Activities Not Covered

1. Traditional Construction Projects Not Covered

This General Permit does not apply to the following construction activity:

a. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

b. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.

c. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.

d. Discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction projects in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit. Construction projects within the Lahontan region must also comply with the Lahontan Region Project Guideline for Erosion Control (R6T-2005-0007 Section), which can be found at **http://www.waterboards.ca.gov/lahontan/Adopted_Orders/2005/r6t_2005_0007.pdf**

e. Construction activity that disturbs less than one acre of land surface, unless part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

f. Construction activity covered by an individual NPDES Permit for storm water discharges.

g. Landfill construction activity that is subject to the Industrial General Permit.

h. Construction activity that discharges to Combined Sewer Systems.

i. Conveyances that discharge storm water runoff combined with municipal sewage.

j. Discharges of storm water identified in CWA § 402(*l*)(2), 33 U.S.C. § 1342(*l*)(2).

2. **Linear Projects Not Covered**

a. LUP construction activity does not include linear routine maintenance projects. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements, or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:

i. Maintain the original purpose of the facility or hydraulic capacity.

ii. Update existing lines[5] and facilities to comply with applicable codes, standards, and regulations regardless if such projects result in increased capacity.

iii. Repairing leaks.

[5]Update existing lines includes replacing existing lines with new materials or pipes.

Routine maintenance does not include construction of new[6] lines or facilities resulting from compliance with applicable codes, standards, and regulations.

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must secure new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

b. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).

c. Tie-ins conducted immediately adjacent to "energized" or "pressurized" facilities by the discharger are not considered construction activities where all other LUP construction activities associated with the tie-in are covered by an NOI and SWPPP of a third party or municipal agency.

3. EPA's Small Construction Rainfall Erosivity Waiver

EPA's Storm Water Phase II Final Rule provides the option for a Small Construction Rainfall Erosivity Waiver. This waiver applies to small construction sites between 1 and 5 acres, and allows permitting authorities to waive those sites that do not have adverse water quality impacts.

Dischargers eligible for this waiver are exempt from Construction General Permit Coverage. In order to obtain the waiver, the discharger must certify to the State Water Board that small construction activity will occur only when the rainfall erosivity factor is less than 5 ("R" in the Revised Universal Soil Loss Equation). The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a practice that provides interim non-vegetative stabilization can be used for the end of the construction period. The operator must agree (as a condition waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the General Permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with a certification statement constitutes acceptance of and commitment to complete the final stabilization process. The discharger must submit a waiver certification to the State Board prior to commencing construction activities.

USEPA funded a cooperative agreement with Texas A&M University to develop an online rainfall erosivity calculator. Dischargers can access the calculator from EPA's website at: www.epa.gov/npdes/storm water/cgp. Use of the calculator allows the discharger to determine potential eligibility for the rainfall erosivity waiver. It may also be useful in determining the time periods during which construction activity could be waived from permit coverage.

[6]New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

D. Obtaining and Terminating Permit Coverage

The appropriate Legally Responsible Person (LRP) must obtain coverage under this General Permit. To obtain coverage, the LRP or the LRP's Approved Signatory must file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.

To obtain coverage under this General Permit, LRPs must electronically file the PRDs, which include a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other documents required by this General Permit, and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Boards may issue General Permits or Individual Permits that contain more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers that obtain coverage under Individual Permits.

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

The application requirements of the General Permit establish a mechanism to clearly identify the responsible parties, locations, and scope of operations of dischargers covered by the General Permit and to document the discharger's knowledge of the General Permit's requirements.

This General Permit provides a grandfathering exception to existing dischargers subject to Water Quality Order No. 99-08-DWQ. Construction projects covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at Risk Level 1. LUP projects covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage at LUP Type 1. The Regional Water Boards have the authority to require Risk Determination to be performed on projects currently covered under Water Quality Order No. 99-08-DWQ and 2003-0007-DWQ where they deem necessary.

LRPs must file a Notice of Termination (NOT) with the Regional Water Board when construction is complete and final stabilization has been reached or ownership has been transferred. The discharger must certify that all State and local requirements have been met in accordance with this General Permit. In order for construction to be found complete, the discharger must install post-construction storm water management measures and establish a long-term maintenance plan. This requirement is intended to ensure that the post-construction conditions at the project site do not cause or contribute to direct or indirect water quality impacts (i.e., pollution and/or hydromodification) upstream and downstream. Specifically, the discharger must demonstrate compliance with the post-construction standards set forth in this General Permit (Section XIII). The discharger is responsible for all compliance issues including all annual fees until the NOT has been filed and approved by the local Regional Water Board.

E. Discharge Prohibitions

This General Permit authorizes the discharge of storm water to surface waters from construction activities that result in the disturbance of one or more acres of land, provided that the discharger satisfies all permit conditions set forth in the Order. This General Permit prohibits the discharge of pollutants other than storm water and non-storm water discharges authorized by this General Permit or another NPDES permit. This General Permit also prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges. In addition, this General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the nine Regional Water Boards. Discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.

Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural BMPs. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction projects. Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water dewatering, and other discharges not subject to a separate general NPDES permit adopted by a region. Therefore this General Permit authorizes such discharges provided they meet the following conditions.

These authorized non-storm water discharges must:

1. be infeasible to eliminate;
2. comply with BMPs as described in the SWPPP;
3. filter or treat, using appropriate technology, all dewatering discharges from sedimentation basins;
4. meet the NALs for pH and turbidity; and
5. not cause or contribute to a violation of water quality standards.

Additionally, authorized non-storm water discharges must not be used to clean up failed or inadequate construction or post-construction BMPs designed to keep materials onsite. Authorized non-storm water dewatering discharges may require a permit because some Regional Water Boards have adopted General Permits for dewatering discharges.

This General Permit prohibits the discharge of storm water that causes or threatens to cause pollution, contamination, or nuisance.

F. Effluent Standards for All Types of Discharges

1. Technology-Based Effluent Limitations

Permits for storm water discharges associated with construction activity must meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize best available technology economically achievable (BAT) for toxic pollutants and non conventional pollutants and best conventional pollutant control technology (BCT) for conventional pollutants. Additionally, these provisions require controls of pollutant discharges to reduce pollutants and any more stringent controls necessary to meet water quality standards. The USEPA has already established such limitations, known as effluent limitation guidelines (ELGs), for some industrial categories. This is not the case with construction discharges. In instances where there are no ELGs the permit writer is to use best professional judgment (BPJ) to establish requirements that the discharger must meet using BAT/BCT technology. This General Permit contains only narrative effluent limitations and does not contain numeric effluent limitations, except for Active Treatment Systems (ATS).

Order No. 2009-0009-DWQ, as originally adopted by the State Water Board on September 2, 2009, contained numeric effluent limitations for pH (within the range of 6.0 and 9.0 pH units) and turbidity (500 NTU) that applied only to Risk Level 3 and LUP Type 3 construction sites. The State Water Board adopted the numeric effluent limitations as technology-based effluent limitations based upon its best professional judgment. The California Building Industry Association, the Building Industry Legal Defense

Foundation, and the California Business Properties Association (petitioners) challenged Order No. 2009-0009-DWQ in *California Building Industry Association et al. v. State Water Resources Control Board*. On December 27, 2011, the Superior Court issued a judgment and writ of mandamus. The Superior Court ruled in favor of the State Water Board on almost all of the issues the petitioners raised, but the Superior Court invalidated the numeric effluent limitations for pH and turbidity for Risk Level 3 and LUP Type 3 sites because it determined that the State Water Board did not have sufficient BMP performance data to support those numeric effluent limitations. Therefore, the Superior Court concluded that the State Water Board did not comply with the federal regulations that apply to the use of best professional judgment. In invalidating the numeric effluent limitations, the Superior Court also suspended two ancillary requirements (a compliance storm event provision and receiving water monitoring at Risk Level 3 and LUP Type 3 sites that violated the numeric effluent limitations) that related solely to the invalidated numeric effluent limitations.

As a result of the Superior Court's writ of mandamus, this Order no longer contains numeric effluent limitations for pH and turbidity, except for ATS. In addition, as a result of the Superior Court's writ of mandamus, the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 sites were suspended until the State Water Board amended this Order to restore the receiving water monitoring requirements. As amended, this Order now requires Risk Level 3 and LUP Type 3 Dischargers with direct discharges to surface waters to conduct receiving water monitoring whenever their effluent exceeds specified receiving water monitoring triggers. The receiving water monitoring triggers were established at the same levels as the previous numeric effluent limitations (effluent pH outside the range of 6.0 and 9.0 pH units or turbidity exceeding 500 NTU). In restoring the receiving water monitoring requirements, the State Water Board determined that it was appropriate to require receiving water monitoring for these types of sites with direct discharges to surface waters that exceeded the receiving water monitoring triggers under any storm event scenarios, because these sites represent the highest threat to receiving water quality. An exceedance of a receiving water monitoring trigger does not constitute a violation of this General Permit. These receiving water monitoring requirements take effect on the effective date of the amendment to this Order.

BAT/BCT technologies not only include passive systems such as conventional runoff and sediment control, but also treatment systems such as coagulation/flocculation using sand filtration, when appropriate. Such technologies allow for effective treatment of soil particles less 0.02 mm (medium silt) in diameter. The discharger must install structural controls, as necessary, such as erosion and sediment controls that meet BAT and BCT to achieve compliance with water quality standards. The narrative effluent limitations constitute compliance with the requirements of the CWA.

Because the permit is an NPDES permit, there is no legal requirement to address the factors set forth in Water Code sections 13241 and 13263, unless the permit is more stringent than what federal law requires. (See *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 627.) None of the requirements in this permit are more stringent than the minimum federal requirements, which include technology-based requirements achieving BAT/BCT and strict compliance with water quality standards. The inclusion of numeric effluent limitations (NELs) in the permit for Active Treatment Systems does not cause the permit to be more stringent than current federal law. NELs and best management practices are simply two different methods of achieving the same federal requirement: strict compliance with state water quality standards. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The use of NELs to achieve compliance with water quality standards is not a more stringent requirement than the use of BMPs. (State Water Board Order No. WQ 2006-0012 (*Boeing*).) Accordingly, the State Water Board does not need to take into account the factors in Water Code sections 13241 and 13263.

The State Water Board has concluded that the establishment of BAT/BCT will not create or aggravate other environmental problems through increases in air pollution, solid waste generation, or energy consumption. While there may be a slight increase in non-water quality impacts due to the implementation of additional monitoring or the construction of additional BMPs, these impacts will be negligible in comparison with the construction activities taking place on site and would be justified by the water quality benefits associated with compliance.

pH Receiving Water Monitoring Trigger

Given the potential contaminants, the minimum standard method for control of pH in runoff requires the use of preventive measures such as avoiding concrete pours during rainy weather, covering concrete and directing flow away from fresh concrete if a pour occurs during rain, covering scrap drywall and stucco materials when stored outside and potentially exposed to rain, and other housekeeping measures. If necessary, pH-impaired storm water from construction sites can be treated in a filter or settling pond or basin, with additional natural or chemical treatment required to meet pH limits set forth in this permit. The basin or pond acts as a collection point and holds storm water for a sufficient period for the contaminants to be settled out, either naturally or artificially, and allows any additional treatment to take place. The State Water Board considers these techniques to be equivalent to BCT. In determining the pH concentration trigger for discharges, the State Water Board used BPJ to set these limitations.

The chosen trigger was established by calculating three standard deviations above and below the mean pH of runoff from highway construction sites[7] in California. Proper implementation of BMPs should result in discharges that are within the range of 6.0 to 9.0 pH Units.

Turbidity Receiving Water Monitoring Trigger

The Turbidity receiving water monitoring trigger of 500 NTU is a technology-based trigger and was developed using three different analyses aimed at finding the appropriate threshold to set the technology-based limit to ensure environmental protection, effluent quality and cost-effectiveness. The analyses fell into three, main types: (1) an ecoregion-specific dataset developed by Simon et. al. (2004)[8]; (2) Statewide Regional Water Quality Control Board enforcement data; and (3) published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites.

A 1:3 relationship between turbidity (expressed as NTU) and suspended sediment concentration (expressed as mg/L) is assumed based on a review of suspended sediment and turbidity data from three gages used in the USGS National Water Quality Assessment Program:

USGS 11074000 SANTA ANA R BL PRADO DAM CA
USGS 11447650 SACRAMENTO R A FREEPORT CA
USGS 11303500 SAN JOAQUIN R NR VERNALIS CA

The receiving water monitoring trigger represents staff determination that the trigger value is the most practicable based on available data. The turbidity receiving water monitoring trigger represents a bridge between the narrative effluent limitations and receiving water limitations. To support this receiving water monitoring trigger, State Water Board staff analyzed construction site discharge information (monitoring data, estimates) and receiving water monitoring information.

Since the turbidity receiving water monitoring trigger represents an appropriate threshold level expected at a site, compliance with this value does not necessarily represent compliance with either the narrative effluent limitations (as enforced through the BAT/BCT standard) or the receiving water limitations. In the San Diego region, some inland surface waters have a receiving water objective for turbidity equal to 20 NTU. Obviously a discharge up to, but not exceeding, the turbidity receiving water monitoring trigger of

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[7] Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-02-055.pdf.

500 NTU may still cause or contribute to the exceedance of the 20 NTU standard. Most of the waters of the State are protected by turbidity objectives based on background conditions**.**

Table 1 - Regional Water Board Basin Plans, Water Quality Objectives for Turbidity

REGIONAL WATER BOARD	WQ Objective	Background/Natural Turbidity	Maximum Increase
1	Based on background	All levels	20%
2	Based on background	> 50 NTU	10%
3	Based on background	0-50 JTU 50-100 JTU > 100 JTU	20% 10 NTU 10%
4	Based on background	0-50 NTU > 50 NTU	20% 10%
5	Based on background	0-5 NTU 5-50 NTU 50-100 NTU >100 NTU	1 NTU 20% 10 NTU 10%
6	Based on background	All levels	10%
7	Based on background	N/A	N/A
8	Based on background	0-50 NTU 50-100 NTU >100 NTU	20% 10 NTU 10%
9	Inland Surface Waters, 20 NTU All others, based on background	0-50 NTU 50-100 NTU >100 NTU	20% 10 NTU 10%

Table 2 shows the suspended sediment concentrations at the 1.5 year flow recurrence interval for the 12 ecoregions in California from Simon et. al (2004).

Table 2 - Results of Ecoregion Analysis

Ecoregion	Percent of California Land Area	Median Suspended Sediment Concentration (mg/L)
1	9.1	874
4	0.2	120
5	8.8	35.6
6	20.7	1530
7	7.7	122
8	3.0	47.4
9	9.4	284
13	5.2	143
14	21.7	5150
78	8.1	581
80	2.4	199
81	3.7	503
Area-weighted average		1633

If a 1:3 relationship between turbidity and suspended sediment is assumed, the median turbidity is 544 NTU.

The following table is composed of turbidity readings measured in NTUs from administrative civil liability (ACL) actions for construction sites from 2003 - 2009. This data was derived from the complete listing of construction-related ACLs for the six year period. All ACLs were reviewed and those that included turbidimeter readings at the point of storm water discharge were selected for this dataset.

Table 3 – ACL Sampling Data taken by Regional Water Board Staff

WDID#	Region	Discharger	Turbidity (NTU)
5S34C331884	5S	Bradshaw Interceptor Section 6B	1800
5S05C325110	5S	Bridalwood Subdivision	1670
5S48C336297	5S	Cheyenne at Browns Valley	1629
5R32C314271	5R	Grizzly Ranch Construction	1400
6A090406008	6T	El Dorado County Department of Transportation, Angora Creek	97.4
5S03C346861	5S	TML Development, LLC	1600
6A31C325917	6T	Northstar Village	See Subdata Set

Subdata Set - Turbidity for point of storm water runoff discharge at Northstar Village

Date	Turbidity (NTU)	Location
10/5/2006	900	Middle Martis Creek
11/2/2006	190	Middle Martis Creek
01/04/2007	36	West Fork, West Martis Creek
02/08/2007	180	Middle Martis Creek
02/09/2007	130	Middle Martis Creek
02/09/2007	290	Middle Martis Creek
02/09/2007	100	West Fork, West Martis Creek
02/10/2007	28	Middle Martis Creek
02/10/2007	23	Middle Martis Creek
02/10/2007	32	Middle Martis Creek
02/10/2007	12	Middle Martis Creek
02/10/2007	60	West Fork, West Martis Creek
02/10/2007	34	West Fork, West Martis Creek

A 95% confidence interval for mean turbidity in an ACL order was constructed. The data set used was a small sample size, so the 500 NTU (the value derived as the receiving water monitoring trigger for this General Permit) needed to be verified as a possible population mean. In this case, the population refers to a hypothetical population of turbidity measurements of which our sample of 20 represents. A t-distribution was assumed due to the small sample size:

Mean: 512.23 NTU
Standard Deviation: 686.85
Margin of Error: 321.45
Confidence Interval: 190.78 NTU (Low)
833.68 NTU (High)

Based on a constructed 95% confidence interval, an ACL order turbidity measurement will be between 190.78 – 833.68 NTU. 500 NTU falls within this range. Using the same data set, a small-sample hypothesis test was also performed to test if the ACL turbidity data set contains enough information to cast doubt on choosing a 500 NTU as a mean. 500 NTU was again chosen due to its proposed use as an acceptable value. The test was carried out using a 95% confidence interval. Results indicated that the ACL turbidity data set *does not* contain significant sample evidence to reject the claim of 500 NTU as an acceptable mean for the ACL turbidity population.

There are not many published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites. The most often cited study is a report titled, "Improving the Cost Effectiveness of Highway Construction Site Erosion and Pollution Control" (Horner, Guedry, and Kortenhof 1990, http://www.wsdot.wa.gov/Research/Reports/200/200.1.htm). In a comment letter summarizing this report sent to the State Water Board, the primary author, Dr. Horner, states:

"The most effective erosion control product was wood fiber mulch applied at two different rates along with a bonding agent and grass seed in sufficient time before the tests to achieve germination. Plots treated in this way reduced influent turbidity by more than 97 percent and discharged effluent exhibiting mean and maximum turbidity values of 21 and 73 NTU, respectively. Some other mulch and blanket materials performed nearly as well. These tests demonstrated the control ability of widely available BMPs over a very broad range of erosion potential."

Other technologies studied in this report produced effluent quality at or near 100 NTU. It is the BPJ of the State Water Board staff that erosion control, while preferred, is not always an option on construction sites and that technology performance in a controlled study showing effluent quality directly leaving a BMP is always easier and cheaper to control than effluent being discharged from the project (edge of property, etc.). As a result, it is the BPJ of the State Water Board staff that it is not cost effective or feasible, at this time, for all risk level and type 3 sites in California to achieve effluent discharges with turbidity values that are less than 100 NTU.

To summarize, the analysis showed that: (1) results of the Simon et. al dataset reveals turbidity values in background receiving water in California's ecoregions range from 16 NTU to 1716 NTU (with a mean of 544 NTU); (2) based on a constructed 95% confidence interval, construction sites will be subject to administrative civil liability (ACL) when their turbidity measurement falls between 190.78 – 833.68 NTU; and (3) sites with highly controlled discharges employing and maintaining good erosion control practices can discharge effluent from the BMP with turbidity values less than 100 NTU. State Water Board staff has determined, using its BPJ, that it is most cost effective to set the receiving water monitoring trigger for turbidity at 500 NTU.

i. ***Compliance Storm Event***

While this General Permit no longer contains "compliance storm event" exceptions from technology-based NELs, the "compliance storm event" exception from the ATS NELs remain in effect. See Section K of this Fact Sheet, and Attachment F of this General Permit for more information.

a. **TMDLs and Waste Load Allocations**

Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL for sediment has been adopted by the Regional Water Board or USEPA, must comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of sediment. If it does, the

TMDL should include a specific waste load allocation for this activity/source. The discharger, in this case, may be required by a separate Regional Water Board order to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. If a specific waste load allocation has been established that would apply to a specific discharge, the Regional Water Board may adopt an order requiring specific implementation actions necessary to meet that allocation. In the instance where an approved TMDL has specified a general waste load allocation to construction storm water discharges, but no specific requirements for construction sites have been identified in the TMDL, dischargers must consult with the state TMDL authority[9] to confirm that adherence to a SWPPP that meets the requirements of the General Permit will be consistent with the approved TMDL.

2. Determining Compliance with Effluent Standards

a. Technology-Based Numeric Action Levels (NALs)

This General Permit contains technology-based NALs for pH and turbidity, and requirements for effluent monitoring at all Risk level 2 & 3, and LUP Type 2 & 3 sites. Numeric action levels are essentially numeric benchmark values for certain parameters that, if exceeded in effluent sampling, trigger the discharger to take actions. Exceedance of an NAL does not itself constitute a violation of the General Permit. If the discharger fails to take the corrective action required by the General Permit, though, that may consititute a violation.

The primary purpose of NALs is to assist dischargers in evaluating the effectiveness of their on-site measures. Construction sites need to employ many different systems that must work together to achieve compliance with the permit's requirements. The NALs chosen should indicate whether the systems are working as intended.

Another purpose of NALs is to provide information regarding construction activities and water quality impacts. This data will provide the State and Regional Water Boards and the rest of the storm water community with more information about levels and types of pollutants present in runoff and how effective the dischargers BMPs are at reducing pollutants in effluent. The State Water Board also hopes to learn more about the linkage between effluent and receiving water quality. In addition, these requirements will provide information on the mechanics needed to establish compliance monitoring programs at construction sites in future permit deliberations.

i. ***pH***

The chosen limits were established by calculating one standard deviation above and below the mean pH of runoff from highway construction sites[10] in California. Proper implementation of BMPs should result in discharges that are within the range of 6.5 to 8.5 pH Units.

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[9] http://www.waterboards.ca.gov/tmdl/tmdl.html.
[10] Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: http://www.dot.ca.gov/hq/env/storm water/pdf/CTSW-RT-02-055.pdf.

The Caltrans study included 33 highway construction sites throughout California over a period of four years, which included 120 storm events. All of these sites had BMPs in place that would be generally implemented at all types of construction sites in California.

ii. ***Turbidity***

BPJ was used to develop an NAL that can be used as a learning tool to help dischargers improve their site controls, and to provide meaningful information on the effectiveness of storm water controls. A statewide turbidity NAL has been set at 250 NTU.

G. Receiving Water Limitations

Construction-related activities that cause or contribute to an exceedance of water quality standards must be addressed. The dynamic nature of construction activity gives the discharger the ability to quickly identify and monitor the source of the exceedances. This is because when storm water mobilizes sediment, it provides visual cues as to where corrective actions should take place and how effective they are once implemented.

This General Permit requires that storm water discharges and authorized non-storm water discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards. The monitoring requirements in this General Permit for sampling and analysis procedures will help determine whether BMPs installed and maintained are preventing pollutants in discharges from the construction site that may cause or contribute to an exceedance of water quality standards.

Water quality standards consist of designated beneficial uses of surface waters and the adoption of ambient criteria necessary to protect those uses. When adopted by the State Water Board or a Regional Water Board, the ambient criteria are termed "water quality objectives." If storm water runoff from construction sites contains pollutants, there is a risk that those pollutants could enter surface waters and cause or contribute to an exceedance of water quality standards. For that reason, dischargers should be aware of the applicable water quality standards in their receiving waters. (The best method to ensure compliance with receiving water limitations is to implement BMPs that prevent pollutants from contact with storm water or from leaving the construction site in runoff.)

In California, water quality standards are published in the Basin Plans adopted by each Regional Water Board, the California Toxics Rule (CTR), the National Toxics Rule (NTR), and the Ocean Plan.

Dischargers can determine the applicable water quality standards by contacting Regional Water Board staff or by consulting one of the following sources. The actual Basin Plans that contain the water quality standards can be viewed at the website of the appropriate Regional Water Board. (http://www.waterboards.ca.gov/regions.html), the State Water Board site for statewide plans (http://www.waterboards.ca.gov/plnspols/index.html), or the USEPA regulations for the NTR and CTR (40 C.F.R. §§ 131.36-38). Basin Plans and statewide plans are also available by mail from the appropriate Regional Water Board or the State Water Board. The USEPA regulations are available at http://www.epa.gov/. Additional information concerning water quality standards can be accessed through http://www.waterboards.ca.gov/stormwtr/gen_const.html.

H. Training Qualifications and Requirements

The Blue Ribbon Panel (BRP) made the following observation about the lack of industry-specific training requirements:

"Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors."

Order 99-08-DWQ required that all dischargers train their employees on how to comply with the permit, but it did not specificy a curriculum or certification program. This has resulted in inconsistent implementation by all affected parties - the dischargers, the local governments where the construction activity occurs, and the regulators required to enforce 99-08-DWQ. This General Permit requires Qualified SWPPP Developers and practitioners to obtain appropriate training, and makes this curriculum mandatory two years after adoption, to allow time for course completion. The State and Regional Water Board are working with many stakeholders to develop the curriculum and mechanisms needed to develop and deliver the courses.

To ensure that the preparation, implementation, and oversight of the SWPPP is sufficient for effective pollution prevention, the Qualified SWPPP Developer and Qualified SWPPP Practitioners responsible for creating, revising, overseeing, and implementing the SWPPP must attend a State Water Board-sponsored or approved Qualified SWPPP Developer and Qualified SWPPP Practitioner training course.

I. Sampling, Monitoring, Reporting and Record Keeping

1. Traditional Construction Monitoring Requirements

This General Permit requires visual monitoring at all sites, and effluent water quality at all Risk Level 2 & 3 sites. It requires receiving water monitoring at some Risk Level 3 sites. All sites are required to submit annual reports, which contain various types of information, depending on the site characteristics and events. A summary of the monitoring and reporting requirements is found in Table 4.

Table 4 - Required Monitoring Elements for Risk Levels

	Visual	Non-visible Pollutant	Effluent	Receiving Water
Risk Level 1	three types required for all Risk Levels: non-storm water, pre-rain and post-rain	As needed for all Risk Levels (see below)	where applicable	not required
Risk Level 2			pH, turbidity	not required
Risk Level 3			pH, turbidity	(if Receiving Water Monitoring Trigger exceeded) pH, turbidity and SSC. Bioassessment for sites 30 acres or larger.

a. Visual

All dischargers are required to conduct quarterly, non-storm water visual inspections. For these inspections, the discharger must visually observe each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources. For storm-related inspections, dischargers must visually observe storm water discharges at all discharge locations within two business days after a qualifying event. For this requirement, a qualifying rain event is one producing precipitation of ½ inch or more of discharge.   Dischargers must conduct a post-storm event inspection to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify any additional BMPs necessary and revise the SWPPP accordingly. Dischargers must maintain on-site records of all visual observations, personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

b. Non-Visible Pollutant Monitoring

This General Permit requires that all dischargers develop a sampling and analysis strategy for monitoring pollutants that are not visually detectable in storm water. Monitoring for non-visible pollutants must be required at any construction site when the exposure of construction materials occurs and where a discharge can cause or contribute to an exceedance of a water quality objective.

Of significant concern for construction discharges are the pollutants found in materials used in large quantities at construction sites throughout California and exposed throughout the rainy season, such as cement, flyash, and other recycled materials or by-products of combustion. The water quality standards that apply to these materials will depend on their composition. Some of the more common storm water pollutants from construction activity are not CTR pollutants. Examples of non-visible pollutants include glyphosate (herbicides), diazinon and chlorpyrifos (pesticides), nutrients (fertilizers), and molybdenum (lubricants). The use of diazinon and chlorpyrifos is a common practice among landscaping professionals and may trigger sampling and analysis requirements if these materials come into contact with storm water. High pH values from cement and gypsum, high pH and SSC from wash waters, and chemical/fecal contamination from portable toilets, also are not CTR pollutants. Although some of these constituents do have numeric water quality objectives in individual Basin Plans, many do not and are subject only to narrative water quality standards (i.e. not causing toxicity). Dischargers are encouraged to discuss these issues with Regional Water Board staff and other storm water quality professionals.

The most effective way to avoid the sampling and analysis requirements, and to ensure permit compliance, is to avoid the exposure of construction materials to precipitation and storm water runoff. Materials that are not exposed do not have the potential to enter storm water runoff, and therefore receiving waters sampling is not required. Preventing contact between storm water and construction materials is one of the most important BMPs at any construction site.

Preventing or eliminating the exposure of pollutants at construction sites is not always possible. Some materials, such as soil amendments, are designed to be used in a manner that will result in exposure to storm water. In these cases, it is important to make sure that these materials are applied according to the manufacturer’s instructions and at a time when they are unlikely to be washed away. Other construction materials can be exposed when storage, waste disposal or the application of the material is done in a manner not protective of water quality. For these situations, sampling is required unless there is capture and containment of all storm water that has been exposed. In cases where construction materials may be exposed to storm water, but the storm water is contained and is not allowed to run off the site, sampling will only be required when inspections show that the containment failed or is breached, resulting in potential exposure or discharge to receiving waters.

The discharger must develop a list of potential pollutants based on a review of potential sources, which will include construction materials soil amendments, soil treatments, and historic contamination at the site. The discharger must review existing environmental and real estate documentation to determine the potential for pollutants that could be present on the construction site as a result of past land use activities.

Good sources of information on previously existing pollution and past land uses include:

i. Environmental Assessments;

ii. Initial Studies;

iii. Phase 1 Assessments prepared for property transfers; and

iv. Environmental Impact Reports or Environmental Impact Statements prepared under the requirements of the National Environmental Policy Act or the California Environmental Quality Act.

In some instances, the results of soil chemical analyses may be available and can provide additional information on potential contamination.

The potential pollutant list must include all non-visible pollutants that are known or should be known to occur on the construction site including, but not limited to, materials that:

i. are being used in construction activities;

ii. are stored on the construction site;

iii. were spilled during construction operations and not cleaned up;

iv. were stored (or used) in a manner that created the potential for a release of the materials during past land use activities;

v. were spilled during previous land use activities and not cleaned up; or

vi. were applied to the soil as part of past land use activities.

C. Effluent Monitoring

Federal regulations[11] require effluent monitoring for discharges subject to NALs. Subsequently, all Risk Level 2 and 3 dischargers must perform sampling and analysis of effluent discharges to characterize discharges associated with construction activity from the entire area disturbed by the project. Dischargers must collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.

Table 5 - Storm Water Effluent Monitoring Requirements by Risk Level

	Frequency	Effluent Monitoring (Section E, below)
Risk Level 1	when applicable	non-visible pollutant parameters (if applicable)
Risk Level 2	Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area.	pH, turbidity, and non-visible pollutant parameters (if applicable)
Risk Level 3	Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area.	pH, turbidity, and non-visible pollutant parameters if applicable

Risk Level 1 dischargers must analyze samples for:

i. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment C contained in the General Permit.

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[11] 40 C.F.R. § 122.44.

Risk Level 2 dischargers must analyze samples for:

i. pH and turbidity;

ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment D contained in the General Permit, and

iii. any additional parameters for which monitoring is required by the Regional Water Board.

Risk Level 3 dischargers must analyze samples for:

i. pH, turbidity;

ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment E contained in the General Permit, and

iii. any additional parameters for which monitoring is required by the Regional Water Board.

2. Linear Monitoring and Sampling Requirements

Attachment A, establishes minimum monitoring and reporting requirements for all LUPs. It establishes different monitoring requirements depending on project complexity and risk to water quality. The monitoring requirements for Type 1 LUPs are less than Type 2 & 3 projects because Type 1 projects have a lower potential to impact water quality.

A discharger shall prepare a monitoring program prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project.

a. Type 1 LUP Monitoring Requirements

A discharger must conduct daily visual inspections of Type 1 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be conducted in conjunction with other daily activities. Inspections will be conducted to ensure the BMPs are adequate, maintained, and in place at the end of the construction day. The discharger will revise the SWPPP, as appropriate, based on the results of the daily inspections. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures have been installed, and successful final vegetative cover or other stabilization criteria have been met).

A discharger shall implement the monitoring program for inspecting Type 1 LUPs. This program requires temporary and permanent stabilization BMPs after active construction is completed. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where re-vegetation is chosen until minimum vegetative coverage has been established. Photographs shall be taken during site inspections and submitted to the State Water Board.

b. Type 2 & 3 LUP Monitoring Requirements

A discharger must conduct daily visual inspections of Type 2 & 3 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be in conjunction with other daily activities.

All dischargers of Type 2 & 3 LUPs are required to conduct inspections by qualified personnel of the construction site during normal working hours prior to all anticipated storm events and after actual storm events. During extended storm events, the discharger shall conduct inspections during normal working hours for each 24-hour period. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures installed, and successful vegetative cover or other stabilization criteria have been met).

The goals of these inspections are (1) to identify areas contributing to a storm water discharge; (2) to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly installed and functioning in accordance with the terms of the General Permit; and (3) to determine whether additional control practices or corrective maintenance activities are needed. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible, depending upon worker safety.

All dischargers shall develop and implement a monitoring program for inspecting Type 2 & 3 LUPs that require temporary and permanent stabilization BMPs after active construction is completed. Inspections will be conducted to ensure the BMPs are adequate and maintained. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where revegetation is chosen until minimum vegetative coverage has been established.

A log of inspections conducted before, during, and after the storm events must be maintained in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection. Photographs must be taken during site inspections and submitted to the State Water Board.

C. Sampling Requirements for all LUP Project Types

LUPs are also subject to sampling and analysis requirements for visible pollutants (i.e., sedimentation/siltation, turbidity) and for non-visible pollutants.

Sampling for visible pollutants is required for Type 2 & 3 LUPs.

Non-visible pollutant monitoring is required for pollutants associated with construction sites and activities that (1) are not visually detectable in storm water discharges, and (2) are known or should be known to occur on the construction site, and (3) could cause or contribute to an exceedance of water quality objectives in the receiving waters. Sample collection for non-visible pollutants must only be required (1) during a storm event when pollutants associated with construction activities may be discharged with storm water runoff due to a spill, or in the event there was a breach, malfunction, failure, and/or leak of any BMP, and (2) when the discharger has failed to adequately clean the area of material and pollutants. Failure to implement appropriate BMPs will trigger the same sampling requirements as those required for a breach, malfunction and/or leak, or when the discharger has failed to implement appropriate BMPs prior to the next storm event.

Additional monitoring parameters may be required by the Regional Water Boards.

It is not anticipated that many LUPs will be required to collect samples for pollutants not visually detected in runoff due to the nature and character of the construction site and activities as previously described in this fact sheet. Most LUPs are constructed in urban areas with public access (e.g., existing roadways, road shoulders, parking areas, etc.). This raises a concern regarding the potential contribution of pollutants from vehicle use and/or from normal activities of the public (e.g., vehicle washing, landscape fertilization, pest spraying, etc.) in runoff from the project site. Since the dischargers are not the land owners of the project area and are not able to control the presence of these pollutants in the storm water that runs through their projects, it is not the intent of this General Permit to require dischargers to sample for these pollutants. This General Permit does not require the discharger to sample for these types of pollutants except where the discharger has brought materials onsite that contain these pollutants and when a condition (e.g., breach, failure, etc.) described above occurs.

3. Receiving Water Monitoring

In order to ensure that receiving water limitations are met, discharges subject to receiving water monitoring triggers (i.e., Risk Level 3 and LUP Type 3 sites) or numeric effluent limitations (i.e., Risk Level 3 and LUP Type 3 sites utilizing ATS with direct discharges into receiving waters) must also monitor the downstream receiving water(s) for turbidity, SSC, and pH (if applicable) when a receiving water monitoring trigger or NEL is exceeded.

a. Bioassessment Monitoring

This General Permit requires a bioassessment of receiving waters for dischargers of Risk Level 3 or LUP Type 3 construction projects equal to or larger than 30 acres with direct discharges into receiving waters. Benthic macroinvertebrate samples will be taken upstream and downstream of the site's discharge point in the receiving water. Bioassessments measure the quality of the stream by analyzing the aquatic life present. Higher levels of appropriate aquatic species tend to indicate a healthy stream; whereas low levels of organisms can indicate stream degradation. Active construction sites have the potential to discharge large amounts of sediment and pollutants into receiving waters. Requiring a bioassessment for large project sites, with the most potential to impact water quality, provides a snapshot of the health of the receiving water prior to initiation of construction activities. This snapshot can be used in comparison to the health of the receiving water after construction has commenced.

Each ecoregion (biologically and geographically related area) in the State has a specific yearly peak time where stream biota is in a stable and abundant state. This time of year is called an Index Period. The bioassessment requirements in this General Permit, requires benthic macroinvertebrate sampling within a sites index period. The State Water Board has developed a map designating index periods for the ecoregions in the State (see State Water Board Website).

This General Permit requires the bioassessment methods to be in accordance with the Surface Water Ambient Monitoring Program (SWAMP) in order to provide data consistency within the state as well as generate useable biological stream data.

Table 6 - Receiving Water Monitoring Requirements

	Receiving Water Monitoring Parameters
Risk Level 1 /LUP Type 1	not required
Risk Level 2 / LUP Type 2	not required
Risk Level 3 / LUP Type 3	If Receiving Water Monitoring Trigger exceeded: pH (if applicable), turbidity, and SSC. Bioassessment for sites 30 acres or larger.

4. Reporting Requirements

a. NAL Exceedance Report

All Risk Level 3 and LUP Type 3 dischargers must electronically submit all storm event sampling results to the State And Regional Boards, via the electronic data system, no later than 10 days after the conclusion of the storm event.

b. Annual Report

All dischargers must prepare and electronically submit an annual report no later than September 1 of each year using the Storm water Multi-Application Reporting and Tracking System (SMARTS). The

Annual Report must include a summary and evaluation of all sampling and analysis results, original laboratory reports, chain of custody forms, a summary of all corrective actions taken during the compliance year, and identification of any compliance activities or corrective actions that were not implemented.

5. Record Keeping

According to 40 C.F.R. Parts 122.21(p) and 122.41(j), the discharger is required to retain paper or electronic copies of all records required by this General Permit for a period of at least three years from the date generated or the date submitted to the State Water Board or Regional Water Boards. A discharger must retain records for a period beyond three years as directed by Regional Water Board.

J. Risk Determination

1. Traditional Projects

a. Overall Risk Determination

There are two major requirements related to site planning and risk determination in this General Permit. The project's overall risk is broken up into two elements – (1) project sediment risk (the relative amount of sediment that can be discharged, given the project and location details) and (2) receiving water risk (the risk sediment discharges pose to the receiving waters).

Project Sediment Risk:
Project Sediment Risk is determined by multiplying the R, K, and LS factors from the Revised Universal Soil Loss Equation (RUSLE) to obtain an estimate of project-related bare ground soil loss expressed in tons/acre. The RUSLE equation is as follows:

A = (R)(K)(LS)(C)(P)

Where: A = the rate of sheet and rill erosion
R = rainfall-runoff erosivity factor
K = soil erodibility factor
LS = length-slope factor
C = cover factor (erosion controls)
P = management operations and support practices (sediment controls)

The C and P factors are given values of 1.0 to simulate bare ground conditions.

There is a map option and a manual calculation option for determining soil loss. For the map option, the R factor for the project is calculated using the online calculator at http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm. The product of K and LS are shown on Figure 1. To determine soil loss in tons per acre, the discharger multiplies the R factor times the value for K times LS from the map.

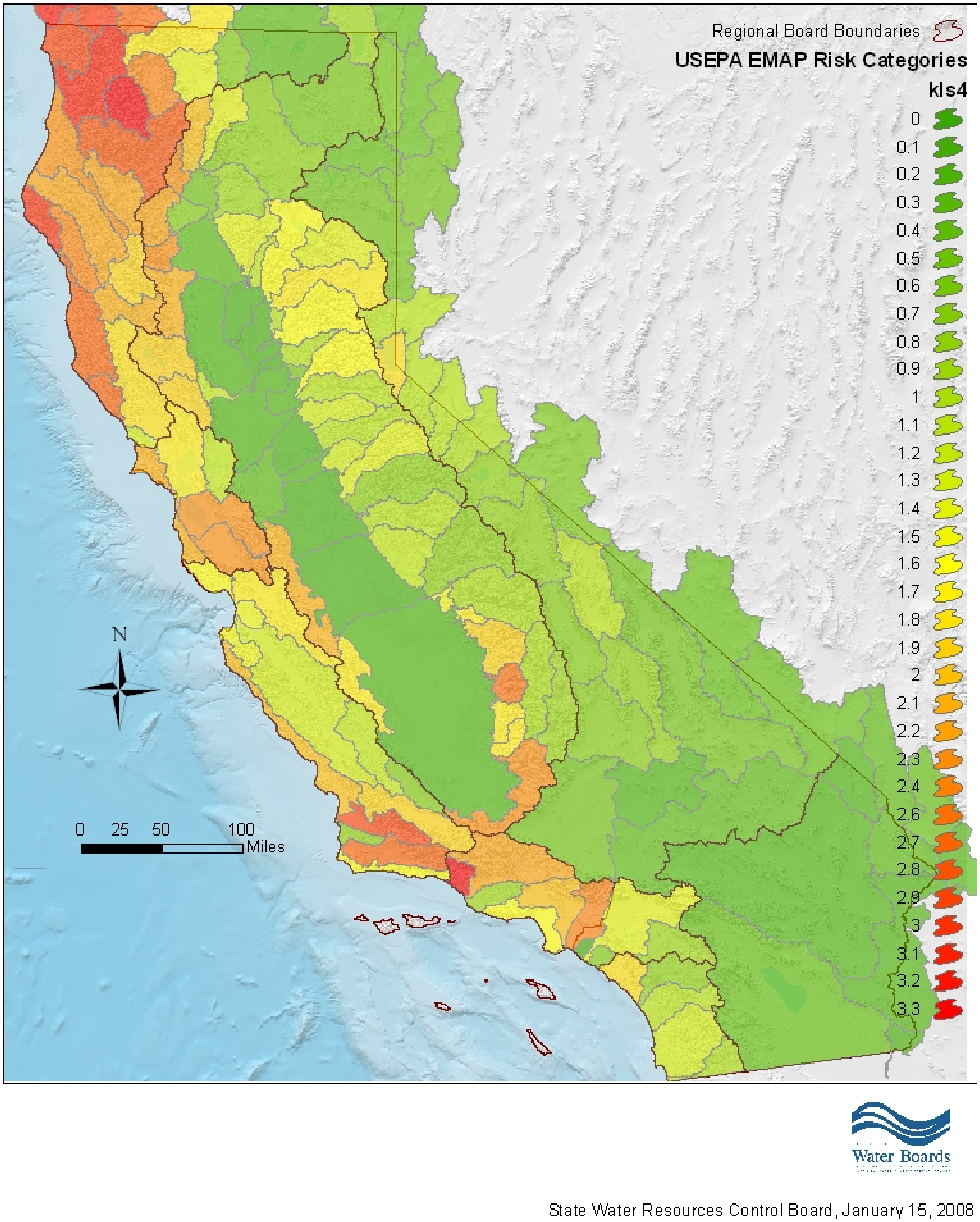

Figure 1 -Statewide Map of K * LS

For the manual calculation option, the R factor for the project is calculated using the online calculator at http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm. The K and LS factors are determined using Appendix 1.

Soil loss of less than 15 tons/acre is considered **low** sediment risk.
Soil loss between 15 and 75 tons/acre is **medium** sediment risk.
Soil loss over 75 tons/acre is considered **high** sediment risk.

The soil loss values and risk categories were obtained from mean and standard deviation RKLS values from the USEPA EMAP program. High risk is the mean RKLS value plus two standard deviations. Low risk is the mean RKLS value minus two standard deviations.

Receiving Water Risk:
Receiving water risk is based on whether a project drains to a sediment-sensitive waterbody. A sediment-sensitive waterbody is either

on the most recent 303d list for waterbodies impaired for sediment;
has a USEPA-approved Total Maximum Daily Load implementation plan for sediment; **or**
has the beneficial uses of COLD, SPAWN, and MIGRATORY.

A project that meets at least one of the three criteria has a high receiving water risk. A list of sediment-sensitive waterbodies will be posted on the State Water Board's website. It is anticipated that an interactive map of sediment sensitive water bodies in California will be available in the future.

The Risk Levels have been altered by eliminating the possibility of a Risk Level 4, and expanding the constraints for Risk Levels 1, 2, and 3. Therefore, projects with high receiving water risk and high sediment risk will be considered a Risk Level 3 risk to water quality.

In response to public comments, the Risk Level requirements have also been changed such that Risk Level 1 projects will be subject to minimum BMP and visual monitoring requirements, Risk Level 2 projects will be subject to NALs and some additional monitoring requirements, and Risk Level 3 projects will be subject to NALs, and more rigorous monitoring requirements such as receiving water monitoring and in some cases bioassessment.

Table 7 - Combined Risk Level Matrix

Combined Risk Level Matrix				
		Sediment Risk		
		Low	Medium	High
Receiving Water Risk	Low	Level 1	Level 2	
	High	Level 2		Level 3

b. Effluent Standards

All dischargers are subject to the narrative effluent limitations specified in the General Permit. The narrative effluent limitations require storm water discharges associated with construction activity to meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize BAT and BCT to reduce pollutants and any more stringent controls necessary to meet water quality standards.

Risk Level 2 dischargers that pose a medium risk to water quality are subject to technology-based NALs for pH and turbidity. Risk Level 3 dischargers that pose a high risk to water quality are also subject to technology-based NALs for pH and turbidity.

c. Good Housekeeping

Proper handling and managing of construction materials can help minimize threats to water quality. The discharger must consider good housekeeping measures for: construction materials, waste management, vehicle storage & maintenance, landscape materials, and potential pollutant sources. Examples include; conducting an inventory of products used, implementing proper storage & containment, and properly cleaning all leaks from equipment and vehicles.

d. Non-Storm Water Management

Non-storm water discharges directly connected to receiving waters or the storm drain system have the potential to negatively impact water quality. The discharger must implement measures to control all non-storm water discharges during construction, and from dewatering activities associated with construction. Examples include; properly washing vehicles in contained areas, cleaning streets, and minimizing irrigation runoff.

e. Erosion Control

The best way to minimize the risk of creating erosion and sedimentation problems during construction is to disturb as little of the land surface as possible by fitting the development to the terrain. When development is tailored to the natural contours of the land, little grading is necessary and, consequently, erosion potential is lower.[14] Other effective erosion control measures include: preserving existing vegetation where feasible, limiting disturbance, and stabilizing and re-vegetating disturbed areas as soon as possible after grading or construction activities. Particular attention must be paid to large, mass-graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great and where there is potential for significant sediment discharge from the site to surface waters. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single most important factor in reducing erosion at construction sites. The discharger is required to consider measures such as: covering disturbed areas with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. These erosion control measures are only examples of what should be considered and should not preclude new or innovative approaches currently available or being developed. Erosion control BMPs should be the primary means of preventing storm water contamination, and sediment control techniques should be used to capture any soil that becomes eroded.[12]

Risk Level 3 dischargers pose a higher risk to water quality and are therefore additionally required to ensure that post-construction soil loss is equivalent to or less than the pre-construction levels.

f. Sediment Control

Sediment control BMPs should be the secondary means of preventing storm water contamination. When erosion control techniques are ineffective, sediment control techniques should be used to capture any soil that becomes eroded. The discharger is required to consider perimeter control measures such as: installing silt fences or placing straw wattles below slopes. These sediment control measures are only

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[12] U.S. Environmental Protection Agency. 2007. Developing Your Storm Water Pollution Prevention Plan: A Guide for Construction Sites.

examples of what should be considered and should not preclude new or innovative approaches currently available or being developed.

Because Risk Level 2 and 3 dischargers pose a higher risk to water quality, additional requirements for the application of sediment controls are imposed on these projects. This General Permit also authorizes the Regional Water Boards to require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of other erosion or sediment controls are not adequately protecting the receiving waters.

g. **Run-on and Runoff Control**

Inappropriate management of run-on and runoff can result in excessive physical impacts to receiving waters from sediment and increased flows. The discharger is required to manage all run-on and runoff from a project site. Examples include: installing berms and other temporary run-on and runoff diversions.

Risk Level 1 dischargers with lower risks to impact water quality are not subject to the run-on and runoff control requirements unless an evaluation deems them necessary or visual inspections show that such controls are required.

h. **Inspection, Maintenance and Repair**

All measures must be periodically inspected, maintained and repaired to ensure that receiving water quality is protected. Frequent inspections coupled with thorough documentation and timely repair is necessary to ensure that all measures are functioning as intended.

i. **Rain Event Action Plan (REAP)**

A Rain Event Action Plan (REAP) is a written document, specific for each rain event. A REAP should be designed that when implemented it protects all exposed portions of the site within 48 hours of any likely precipitation event forecast of 50% or greater probability.

This General Permit requires Risk Level 2 and 3 dischargers to develop and implement a REAP designed to protect all exposed portions of their sites within 48 hours prior to any likely precipitation event. The REAP requirement is designed to ensure that the discharger has adequate materials, staff, and time to implement erosion and sediment control measures that are intended to reduce the amount of sediment and other pollutants generated from the active site. A REAP must be developed when there is likely a forecast of 50% or greater probability of precipitation in the project area. (The National Oceanic and Atmospheric Administration (NOAA) defines a chance of precipitation as a probability of precipitation of 30% to 50% chance of producing precipitation in the project area.[13] NOAA defines the probability of precipitation (PoP) as the likelihood of occurrence (expressed as a percent) of a measurable amount (0.01 inch or more) of liquid precipitation (or the water equivalent of frozen precipitation) during a specified period of time at any given point in the forecast area.) Forecasts are normally issued for 12-hour time periods. Descriptive terms for uncertainty and aerial coverage are used as follows:

Table 8 -National Oceanic and Atmospheric Administration (NOAA) Definition of Probability of Precipitation (PoP)

[13] http://www.crh.noaa.gov/lot/severe/wxterms.php.

PoP	Expressions of Uncertainty	Aerial Coverage
0%	none used	none used
10%	none used	isolated
20%	slight chance	isolated
30-50%	chance	scattered
60-70%	likely	numerous
80-100%	none used	none used

The discharger must obtain the precipitation forecast information from the National Weather Service Forecast Office (http://www.srh.noaa.gov/).

2. Linear Projects

a. Linear Risk Determination

LUPs vary in complexity and water quality concerns based on the type of project. This General Permit has varying application requirements based on the project's risk to water quality. Factors that lead to the characterization of the project include location, sediment risk, and receiving water risk.

Based on the location and complexity of a project area or project section area, LUPs are separated into project types. As described below, LUPs have been categorized into three project types.

i. *Type 1 LUPs*

Type 1 LUPs are those construction projects where:

(1) 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day, or

(2) greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:

Areas disturbed during construction will be returned to pre-construction conditions or equivalent protection established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and

Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization Best Management Practices (BMPs) will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.

Type 1 LUPs typically do not have a high potential to impact storm water quality because (1) these construction activities are not typically conducted during a rain event, (2) these projects are normally constructed over a short period of time[14], minimizing the duration that pollutants could potentially be exposed to rainfall; and (3) disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.

Type 1 LUPs are determined during the risk assessment found in Attachment A.1 to be 1) low sediment risk and low receiving water risk; 2) low sediment risk and medium receiving water risk; and 3) medium sediment risk and low receiving water risk.

This General Permit requires the discharger to ensure a SWPPP is developed for these construction activities that is specific to project type, location and characteristics.

ii. ***Type 2 LUPs:***

Type 2 projects are determined to have a combination of High, Medium, and Low project sediment risk along with High, Medium, and Low receiving water risk. Like Type 1 projects, Type 2 projects are typically constructed over a short period of time. However, these projects have a higher potential to impact water quality because they:

(1) typically occur outside the more urban/developed areas;

(2) have larger areas of soil disturbance that are not closed or restored at the end of the day;

(3) may have onsite stockpiles of soil, spoil and other materials;

(4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and

(5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location and characteristics.

iii. ***Type 3 LUPs:***

[14] Short period of time refers to a project duration of weeks to months, but typically less than one year in duration.

Type 3 projects are determined to have a combination of High and Medium project sediment risk along with High and Medium receiving water risk. Similar to Type 2 projects, Type 3 projects have a higher potential to impact water quality because they:

(1) typically occur outside of the more urban/developed areas;

(2) have larger areas of soil disturbance that are not closed or restored at the end of the day;

(3) may have onsite stockpiles of soil, spoil and other materials;

(4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and

(5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location, and characteristics.

b. **Linear Effluent Standards**

All LUPs are subject to the narrative effluent limitations specified in the General Permit.

Type 2 and Type 3 projects are subject to technology-based NALs for pH and turbidity.

c. **Linear Good Housekeeping**

Improper use and handling of construction materials could potentially cause a threat to water quality. In order to ensure proper site management of these construction materials, all LUP dischargers must comply with a minimum set of Good Housekeeping measures specified in Attachment A of this General Permit.

d. **Linear Non-Storm Water Management**

In order to ensure control of all non-storm water discharges during construction, all LUP dischargers must comply with the Non-Storm Water Management measures specified in Attachment A of this General Permit.

e. **Linear Erosion Control**

This General Permit requires all LUP dischargers to implement effective wind erosion control measures, and soil cover for inactive areas. Type 3 LUPs posing a higher risk to water quality are additionally required to ensure the post-construction soil loss is equivalent to or less than the pre-construction levels.

f. **Linear Sediment Control**

In order to ensure control and containment of all sediment discharges, all LUP dischargers must comply with the general Sediment Control measures specified in Attachment A or this General Permit. Additional requirements for sediment controls are imposed on Type 2 & 3 LUPs due to their higher risk to water quality.

g. **Linear Run-on and Runoff Control**

Discharges originating outside of a project's perimeter and flowing onto the property can adversely affect the quantity and quality of discharges originating from a project site. In order to ensure proper management of run-on and runoff, all LUPs must comply with the run-on and runoff control measures specified in Attachment A of this General Permit. Due to the lower risk of impacting water quality, Type 1 LUPs are not required to implement run-on and runoff controls unless deemed necessary by the discharger.

h. **Linear Inspection, Maintenance and Repair**

Proper inspection, maintenance, and repair activities are important to ensure the effectiveness of on-site measures to control water quality. In order to ensure that inspection, maintenance, and repair activities are adequately performed, the all LUP dischargers a re required to comply with the Inspection, Maintenance, and Repair requirements specified in Attachment A of this General Permit.

K. ATS[15] Requirements

There are instances on construction sites where traditional erosion and sediment controls do not effectively control accelerated erosion. Under such circumstances, or under circumstances where storm water discharges leaving the site may cause or contribute to an exceedance of a water quality standard, the use of an Active Treatment System (ATS) may be necessary. Additionally, it may be appropriate to use an ATS when site constraints inhibit the ability to construct a correctly sized sediment basin, when clay and/or highly erosive soils are present, or when the site has very steep or long slope lengths.[16]

Although treatment systems have been in use in some form since the mid-1990s, the ATS industry in California is relatively young, and detailed regulatory standards have not yet been developed. Many developers are using these systems to treat storm water discharges from their construction sites. The new ATS requirements set forth in this General Permit are based on those in place for small wastewater treatment systems, ATS regulations from the Central Valley Regional Water Quality Control Board (September 2005 memorandum "2005/2006 Rainy Season – Monitoring Requirements for Storm Water Treatment Systems that Utilize Chemical Additives to Enhance Sedimentation"), the Construction Storm Water Program at the State of Washington's Department of Ecology, as well as recent advances in technology and knowledge of coagulant performance and aquatic safety.

The effective design of an ATS requires a detailed survey and analysis of site conditions. With proper planning, ATS performance can provide exceptional water quality discharge and prevent significant impacts to surface water quality, even under extreme environmental conditions.

These systems can be very effective in reducing the sediment in storm water runoff, but the systems that use additives/polymers to enhance sedimentation also pose a potential risk to water quality (e.g., operational failure, equipment failure, additive/polymer release, etc.). The State Water Board is concerned about the potential acute and chronic impacts that the polymers and other chemical additives may have on fish and aquatic organisms if released in sufficient quantities or concentrations. In addition

[15] An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation in order to reduce turbidity caused by fine suspended sediment.
[16] Pitt, R., S. Clark, and D. Lake. 2006. Construction Site Erosion and Sediment Controls: Planning, Design, and Performance. DEStech Publications. Lancaster, PA. 370pp.

to anecdotal evidence of polymer releases causing aquatic toxicity in California, the literature supports this concern.[17] For example, cationic polymers have been shown to bind with the negatively charged gills of fish, resulting in mechanical suffocation.[18] Due to the potential toxicity impacts, which may be caused by the release of additives/polymers into receiving waters, this General Permit establishes residual polymer monitoring and toxicity testing requirements have been established in this General Permit for discharges from construction sites that utilize an ATS in order to protect receiving water quality and beneficial uses.

The primary treatment process in an ATS is coagulation/flocculation. ATS's operate on the principle that the added coagulant is bound to suspended sediment, forming floc, which is gravitationally settled in tanks or a basin, or removed by sand filters. A typical installation utilizes an injection pump upstream from the clarifier tank, basin, or sand filters, which is electronically metered to both flow rate and suspended solids level of the influent, assuring a constant dose. The coagulant mixes and reacts with the influent, forming a dense floc. The floc may be removed by gravitational setting in a clarifier tank or basin, or by filtration. Water from the clarifier tank, basin, or sand filters may be routed through cartridge(s) and/or bag filters for final polishing. Vendor-specific systems use various methods of dose control, sediment/floc removal, filtration, etc., that are detailed in project-specific documentation. The particular coagulant/flocculant to be used for a given project is determined based on the water chemistry of the site because the coagulants are specific in their reactions with various types of sediments. Appropriate selection of dosage must be carefully matched to the characteristics of each site.

ATS's are operated in two differing modes, either Batch or Flow-Through. Batch treatment can be defined as Pump-Treat-Hold-Test-Release. In Batch treatment, water is held in a basin or tank, and is not discharged until treatment is complete. Batch treatment involves holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full. In Flow-Through treatment, water is pumped into the ATS directly from the runoff collection system or storm water holding pond, where it is treated and filtered as it flows through the system, and is then directly discharged. "Flow-Through Treatment" is also referred to as "Continuous Treatment."

1. **Effluent Standards**

This General Permit establishes NELs for discharges from construction sites that utilize an ATS. These systems lend themselves to NELs for turbidity and pH because of their known reliable treatment. Advanced systems have been in use in some form since the mid-1990s. An ATS is considered reliable, can consistently produce a discharge of less than 10 NTU, and has been used successfully at many sites in several states since 1995 to reduce turbidity to very low levels.[19]

This General Permit contains "compliance storm event" exceptions from the technology-based NELs for ATS discharges. The rationale is that technology-based requirements are developed assuming a certain design storm. In the case of ATS the industry-standard design storm is 10-year, 24-hour (as stated in

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[17] RomØen, K., B. Thu, and Ø. Evensen. 2002. Immersion delivery of plasmid DNA II. A study of the potentials of a chitosan based delivery system in rainbow trout (*Oncorhynchus mykiss*) fry. *Journal of Controlled Release* **85**: 215-225.
[18] Bullock, G., V. Blazer, S. Tsukuda, and S. Summerfelt. 2000. Toxicity of acidified chitosan for cultured rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* **185**:273-280.
[19] Currier, B., G. Minton, R. Pitt, L. Roesner, K. Schiff, M. Stenstrom, E. Strassler, and E. Strecker. 2006. The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities.

Attachment F of this General Permit), so the compliance storm event has been established as the 10-year 24-hour event as well to provide consistency.

2. **Training**

Operator training is critical to the safe and efficient operation and maintenance of the ATS, and to ensure that all State Water Board monitoring and sampling requirements are met. The General Permit requires that all ATS operators have training specific to using ATS's liquid coagulants.

L. Post-Construction Requirements

Under past practices, new and redevelopment construction activities have resulted in modified natural watershed and stream processes. This is caused by altering the terrain, modifying the vegetation and soil characteristics, introducing impervious surfaces such as pavement and buildings, increasing drainage density through pipes and channels, and altering the condition of stream channels through straightening, deepening, and armoring. These changes result in a drainage system where sediment transport capacity is increased and sediment supply is decreased. A receiving channel's response is dependent on dominant channel materials and its stage of adjustment.

Construction activity can lead to impairment of beneficial uses in two main ways. First, during the actual construction process, storm water discharges can negatively affect the chemical, biological, and physical properties of downstream receiving waters. Due to the disturbance of the landscape, the most likely pollutant is sediment, however pH and other non-visible pollutants are also of great concern. Second, after most construction activities are completed at a construction site, the finished project may result in significant modification of the site's response to precipitation. New development and redevelopment projects have almost always resulted in permanent post-construction water quality impacts because more precipitation ends up as runoff and less precipitation is intercepted, evapotranspired, and infiltrated.

General Permit 99-08-DWQ required the SWPPP to include a description of all post-construction BMPs on a site and a maintenance schedule. An effective storm water management strategy must address the full suite of storm events (water quality, channel protection, overbank flood protection, extreme flood protection) (Figure 2).

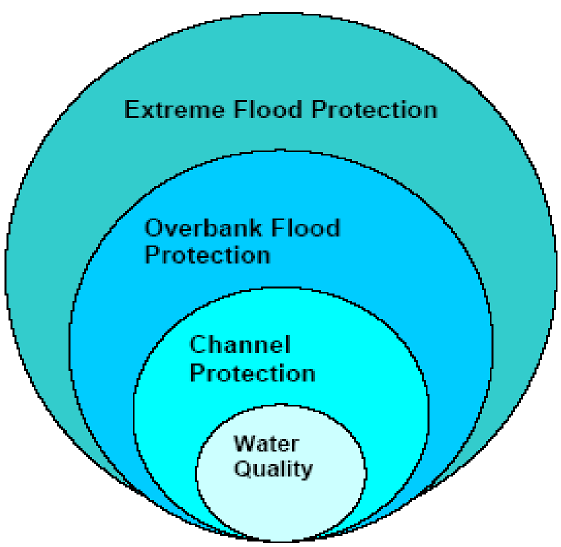

Figure 2 - Suite of Storm Events

The post-construction storm water performance standards in this General Permit specifically address water quality and channel protection events. Overbank flood protection and extreme flood protection events are traditionally dealt with in local drainage and flood protection ordinances. However, measures in this General Permit to address water quality and channel protection also reduce overbank and extreme flooding impacts. This General Permit aims to match post-construction runoff to pre-construction runoff for the 85th percentile storm event, which not only reduces the risk of impact to the receiving water's channel morphology but also provides some protection of water quality.

This General Permit clarifies that its runoff reduction requirements only apply to projects that lie outside of jurisdictions covered by a Standard Urban Storm water Management Plan (SUSMP) (or other more protective) post-construction requirements in either Phase I or Phase II permits.

Figures 3 and 4, below, show the General Permit enrollees (to Order 99-08-DWQ, as of March 10, 2008) overlaid upon a map with SUSMP (or more protective) areas in blue and purple. Areas without blue or purple indicate where the General Permit's runoff reduction requirements would actually apply.

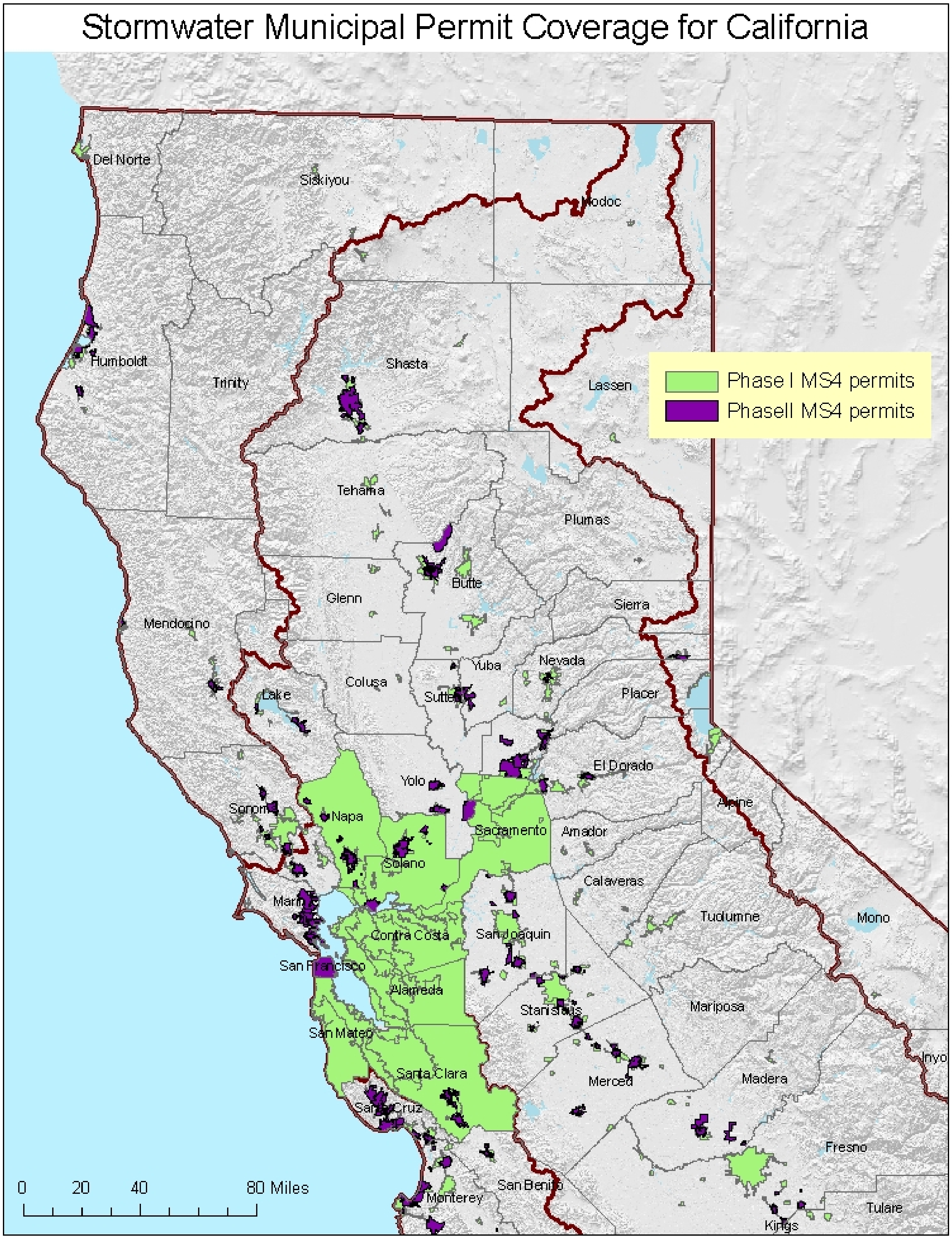

Figure 3 - Northern CA (2009) Counties / Cities With SUSMP-Plus Coverage

Figure 4 - Southern CA (2009) Counties / Cities With SUSMP-Plus Coverage

Water Quality:
This General Permit requires dischargers to replicate the pre-project runoff water balance (defined as the amount of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event, or the smallest storm event that generates runoff, whichever is larger. Contemporary storm water management generally routes these flows directly to the drainage system, increasing pollutant loads and potentially causing adverse effects on receiving waters. These smaller water quality events happen much more frequently than larger events and generate much higher pollutant loads on an annual basis. There are other adverse hydrological impacts that result from not designing according to the site's pre-construction water balance. In Maryland, Klein[20] noted that baseflow decreases as the extent of urbanization increases. Ferguson and Suckling[21] noted a similar relation in watersheds in Georgia. On Long Island, Spinello and Simmons[22] noted substantial decreases in base flow in intensely urbanized watersheds.

The permit emphasizes runoff reduction through on-site storm water reuse, interception, evapo-transpiration and infiltration through non-structural controls and conservation design measures (e.g., downspout disconnection, soil quality preservation/enhancement, interceptor trees). Employing these measures close to the source of runoff generation is the easiest and most cost-effective way to comply with the pre-construction water balance standard. Using low-tech runoff reduction techniques close to the source is consistent with a number of recommendations in the literature.[23] In many cases, BMPs implemented close to the source of runoff generation cost less than end-of the pipe measures.[24] Dischargers are given the option of using Appendix 2 to calculate the required runoff volume or a watershed process-based, continuous simulation model such as the EPA's Storm Water Management Model (SWMMM) or Hydrologic Simulation Program Fortran (HSPF). Such methods used by the discharger will be reviewed by the Regional Water Board upon NOT application.

Channel Protection:
In order to address channel protection, a basic understanding of fluvial geomorphic concepts is necessary. A dominant paradigm in fluvial geomorphology holds that streams adjust their channel dimensions (width and depth) in response to long-term changes in sediment supply and bankfull discharge (1.5 to 2 year recurrence interval). The bankfull stage corresponds to the discharge at which channel maintenance is the most effective, that is, the discharge at which the moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing work that results in the average morphologic characteristics of channels.[25] Lane (1955 as cited in Rosgen 1996[26]) showed the generalized relationship between sediment load, sediment size, stream discharge and stream slope in

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[20] Klein 1979 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[21] Ferguson and Suckling 1990 as cited Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[22] Center for Watershed Protection (CWP). 2000. The Practice of Watershed Protection: Techniques for protecting our nation's streams, lakes, rivers, and estuaries. Ellicott City, MD. 741 pp.
[23] Bay Area Storm Water Management Agencies Association (BASMAA). 1997. Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality Protection. Palo Alto, CA;
McCuen, R.H. 2003 Smart Growth: hydrologic perspective. Journal of Professional Issues in Engineering Education and Practice. Vol (129), pp.151-154;
Moglen, G.E. and S. Kim. 2007. Impervious imperviousness-are threshold based policies a good idea? Journal of the American Planning Association, Vol 73 No. 2. pp 161-171.
[24] Delaware Department of natural Resources (DDNR). 2004. Green technology: The Delaware urban Runoff Management Approcah. Dover, DE. 117 pp.
[25] Dunne, T and L.B. Leopold. 1978. Water in Environmental Planning. San Francisco W.H. Freeman and Company
[26] Rosgen. D.L. 1996. Applied River Morphology. Pagosa Springs. Wildland Hydrology

Figure 5. A change in any one of these variables sets up a series of mutual adjustments in the companion variables with a resulting direct change in the physical characteristics of the stream channel.

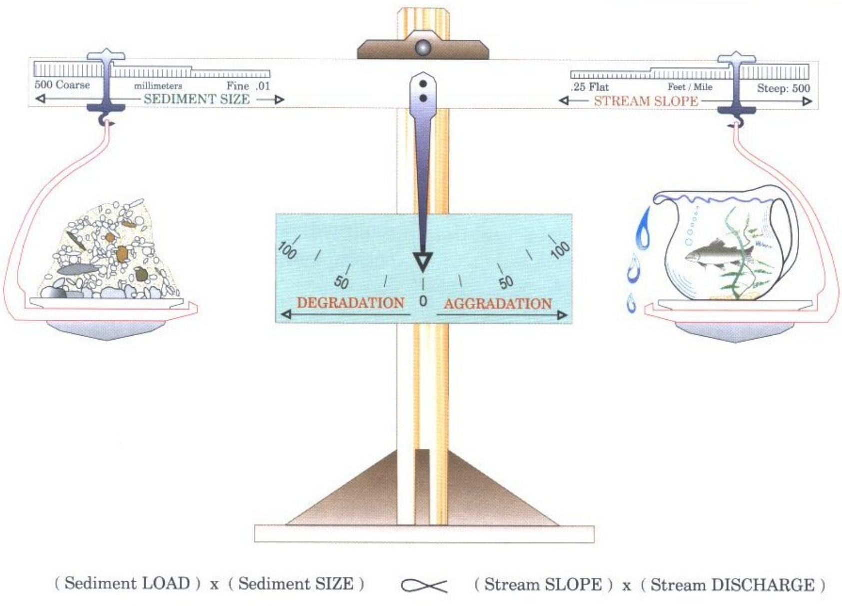

Figure 5 - Schematic of the Lane Relationship

After Lane (1955) as cited in Rosgen (1996)

Stream slope multiplied by stream discharge (the right side of the scale) is essentially an approximation of stream power, a unifying concept in fluvial geomorphology (Bledsoe 1999). Urbanization generally increases stream power and affects the resisting forces in a channel (sediment load and sediment size represented on the left side of the scale).

During construction, sediment loads can increase from 2 to 40,000 times over pre-construction levels.[27] Most of this sediment is delivered to stream channels during large, episodic rain events.[28] This increased sediment load leads to an initial aggradation phase where stream depths may decrease as sediment fills the channel, leading to a decrease in channel capacity and increase in flooding and overbank deposition. A degradation phase initiates after construction is completed.

Schumm et. al (1984) developed a channel evolution model that describes the series of adjustments from initial downcutting, to widening, to establishing new floodplains at lower elevations (Figure 6).

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[27] Goldman S.J., K. Jackson, and T.A. Bursztynsky. 1986. Erosion and Sediment Control Handbook. McGraw Hill. San Francisco.
[28] Wolman 1967 as cited in Paul, M.P. and J.L. Meyer. 2001. Streams in the Urban Landscape. *Annu. Rev.Ecol. Syst.* 32: 333-365.

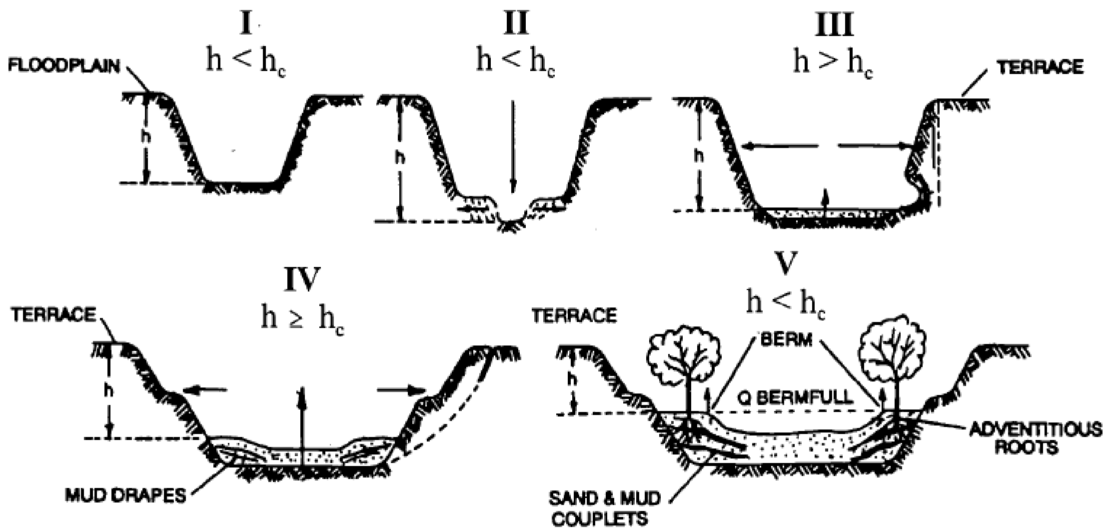

Figure 6 - Channel Changes Associated with Urbanization

After Incised Channel Evolution Sequence in Schumm et. al 1984

Channel incision (Stage II) and widening (Stages III and to a lesser degree, Stage IV) are due to a number of fundamental changes on the landscape. Connected impervious area and compaction of pervious surfaces increase the frequency and volume of bankfull discharges.[29] Increased drainage density (miles of stream length per square mile of watershed) also negatively impacts receiving stream channels.[30] Increased drainage density and hydraulic efficiency leads to an increase in the frequency and volume of bankfull discharges because the time of concentration is shortened. Flows from engineered pipes and channels are also often "sediment starved" and seek to replenish their sediment supply from the channel.

Encroachment of stream channels can also lead to an increase in stream slope, which leads to an increase in stream power. In addition, watershed sediment loads and sediment size (with size generally represented as the median bed and bank particle size, or d_{50}) decrease during urbanization.[31] This means

[29] Booth, D. B. and C. R. Jackson. 1997. Urbanization of Aquatic Systems: Degradation Thresholds, Storm Water Detection, and the Limits of Mitigation. Journal of the American Water Resources Association Vol. 33, No.5, pp. 1077-1089.

[30] May, C.W. 1998. Cumulative effects of urbanization on small streams in the Puget Sound Lowland ecoregion. Conference proceedings from Puget Sound Research '98 held March 12, 13 1998 in Seattle, WA;
Santa Clara Valley Urban Runoff Pollution Prevention Program. 2002. Hydromodification Management Plan Literature Review. 80 pp.

[31] Finkenbine, J.K., D.S. Atwater, and D.S. Mavinic. 2000. Stream health after urbanization. *J. Am. Water Resour. Assoc.* 36:1149-60;

that even if pre- and post-development stream power are the same, more erosion will occur in the post-development stage because the smaller particles are less resistant (provided they are non-cohesive).

As shown in Stages II and III, the channel deepens and widens to accommodate the increased stream power [32]and decrease in sediment load and sediment size. Channels may actually narrow as entrained sediment from incision is deposited laterally in the channel. After incised channels begin to migrate laterally (Stage III), bank erosion begins, which leads to general channel widening.[33] At this point, a majority of the sediment that leaves a drainage area comes from within the channel, as opposed to the background and construction related hillslope contribution. Stage IV is characterized by more aggradation and localized bank instability. Stage V represents a new quasi-equilibrium channel morphology in balance with the new flow and sediment supply regime. In other words, stream power is in balance with sediment load and sediment size.

The magnitude of the channel morphology changes discussed above varies along a stream network as well as with the age of development, slope, geology (sand-bedded channels may cycle through the evolution sequence in a matter of decades whereas clay-dominated channels may take much longer), watershed sediment load and size, type of urbanization, and land use history. It is also dependent on a channel's stage in the channel evolution sequence when urbanization occurs. Management strategies

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Pizzuto, J.E. W.S. Hession, and M. McBride. 2000. Comparing gravel-bed rivers in paired urban and rural catchments of southeastern Pennsylvania. *Geology* 28:79-82.

[32] Hammer 1973 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp;

Booth, D.B. 1990. Stream Channel Incision Following Drainage Basin Urbanization. *Water Resour. Bull.* 26:407-417.

[33] Trimble, S.W. 1997. Contribution of Stream Channel Erosion to Sediment Yield from an Urbanizing Watershed. *Science*: Vol. 278 (21), pp. 1442-1444.

must take into account a channel's stage of adjustment and account for future changes in the evolution of channel form (Stein and Zaleski 2005).[34]

Traditional structural water quality BMPs (e.g. detention basins and other devices used to store volumes of runoff) unless they are highly engineered to provide adequate flow duration control, do not adequately protect receiving waters from accelerated channel bed and bank erosion, do not address post-development increases in runoff volume, and do not mitigate the decline in benthic macroinvertebrate communities in the receiving waters[35] suggest that structural BMPs are not as effective in protecting aquatic communities as a continuous riparian buffer of native vegetation. This is supported by the findings of Zucker and White[36], where instream biological metrics were correlated with the extent of forested buffers.

This General Permit requires dischargers to maintain pre-development drainage densities and times of concentration in order to protect channels and encourages dischargers to implement setbacks to reduce channel slope and velocity changes that can lead to aquatic habitat degradation.

There are a number of other approaches for modeling fluvial systems, including statistical and physical models and simpler stream power models.[37] The use of these models in California is described in Stein and Zaleski (2005).[38] Rather than prescribe a specific one-size-fits-all modeling method in this permit, the State Water Board intends to develop a stream power and channel evolution model-based framework to assess channels and develop a hierarchy of suitable analysis methods and management strategies. In time, this framework may become a State Water Board water quality control policy.

Permit Linkage to Overbank and Extreme Flood Protection

Site design BMPs (e.g. rooftop and impervious disconnection, vegetated swales, setbacks and buffers) filter and settle out pollutants and provide for more infiltration than is possible for traditional centralized structural BMPs placed at the lowest point in a site. They provide source control for runoff and lead to a reduction in pollutant loads. When implemented, they also help reduce the magnitude and volume of larger, less frequent storm events (e.g., 10-yr, 24-hour storm and larger), thereby reducing the need for expensive flood control infrastructure. Nonstructural BMPs can also be a landscape amenity, instead of a large isolated structure requiring substantial area for ancillary access, buffering, screening and maintenance facilities.[25] The multiple benefits of using non-structural benefits will be critically important as the state's population increases and imposes strains upon our existing water resources.

Maintaining predevelopment drainage densities and times of concentration will help reduce post-development peak flows and volumes in areas not covered under a municipal permit. The most effective way to preserve drainage areas and maximize time of concentration is to implement landform grading,

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[34] Stein, E.S. and S. Zaleski. 2005.Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.
[35] Horner, R.R. 2006. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (LID) for the San Diego Region. Available at: http://www.projectcleanwater.org/pdf/permit/case-study_lid.pdf.
[36] Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[37] Finlayson, D.P. and D.R. Montgomery. 2003. Modeling large-scale fluvial erosion in geographic information systems. Geomorphology (53), pp. 147-164).
[38] Stein, E.S. and S. Zaleski. 2005.Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.

incorporate site design BMPs and implement distributed structural BMPs (e.g., bioretention cells, rain gardens, rain cisterns).

M. Storm Water Pollution Prevention Plans

USEPA's Construction General Permit requires that qualified personnel conduct inspections. USEPA defines qualified personnel as "a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity."[39] USEPA also suggests that qualified personnel prepare SWPPPs and points to numerous states that require certified professionals to be on construction sites at all times. States that currently have certification programs are Washington, Georgia, Florida, Delaware, Maryland, and New Jersey. The Permit 99-08-DWQ did not require that qualified personnel prepare SWPPPs or conduct inspections. However, to ensure that water quality is being protected, this General Permit requires that all SWPPPs be written, amended, and certified by a Qualified SWPPP Developer. A Qualified SWPPP Developer must possess one of the eight certifications and or registrations specified in this General Permit and effective two years after the adoption date of this General Permit, must have attended a State Water Board-sponsored or approved Qualified SWPPP Developer training course. Table 9 provides an overview of the criteria used in determining qualified certification titles for a QSD and QSP.

39 US Environmental Protection Agency. Stormwater Pollution Prevention Plans for Construction Activities. <http://cfpub.epa.gov/npdes/stormwater/swppp.cfm> and <http://www.epa.gov/npdes/pubs/sw_swppp_guide.pdf>.

Table 9 - Qualified SWPPP Developer/ Qualified SWPPP Practitioner Certification Criteria

Certification/ Title	Registered By	QSD/QSP	Certification Criteria
Professional Civil Engineer	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Professional Geologist or Engineering Geologist	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Landscape Architect	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Professional Hydrologist	American Institute of Hydrology	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Certified Professional in Erosion and Sediment Control™ (CPESC)	Enviro Cert International Inc.	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Inspector of Sediment and Erosion Control™ (CISEC)	Certified Inspector of Sediment and Erosion Control, Inc.	QSP	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Erosion, Sediment and Storm Water Inspector™ (CESSWI)	Enviro Cert International Inc.	QSP	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Professional in Storm Water Quality™ (CPSWQ)	Enviro Cert International Inc.	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education

The previous versions of the General Permit required development and implementation of a SWPPP as the primary compliance mechanism. The SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of storm water discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in storm water and non-storm water discharges. The SWPPP must include BMPs that address source control, BMPs that address pollutant control, and BMPs that address treatment control.

This General Permit shifts some of the measures that were covered by this general requirement to specific permit requirements, each individually enforceable as a permit term. This General Permit emphasizes the use of appropriately selected, correctly installed and maintained pollution reduction BMPs. This approach provides the flexibility necessary to establish BMPs that can effectively address source control of pollutants during changing construction activities. These specific requirements also improve both the clarity and the enforceability of the General Permit so that the dischargers understand, and the public can determine whether the discharges are in compliance with, permit requirements.

The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project.   The SWPPP must remain on the site during construction activities, commencing with the initial mobilization and ending with the termination of coverage under the General Permit. For LUPs the discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio or telephone. Once construction activities are complete, until stabilization is achieved, the SWPPP shall be available from the SWPPP contact listed in the PRDs

A SWPPP must be appropriate for the type and complexity of a project and will be developed and implemented to address project specific conditions. Some projects may have similarities or complexities, yet each project is unique in its progressive state that requires specific description and selection of BMPs needed to address all possible generated pollutants

N. Regional Water Board Authorities

Because this General Permit will be issued to thousands of construction sites across the State, the Regional Water Boards retain discretionary authority over certain issues that may arise from the discharges in their respective regions. This General Permit does not grant the Regional Water Boards any authority they do not otherwise have; rather, it merely emphasizes that the Regional Water Boards can take specific actions related to this General Permit. For example, the Regional Water Boards will be enforcing this General Permit and may need to adjust some requirements for a discharger based on the discharger’s compliance history.

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LIST OF ATTACHMENTS

LIST OF APPENDICES

STATE WATER RESOURCES CONTROL BOARD
ORDER NO. 2009-0009-DWQ
[AS AMENDED BY ORDER NO. 2010-0014-DWQ]
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
GENERAL PERMIT NO. CAS000002

WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

I. FINDINGS

A. General Findings

The State Water Resources Control Board (State Water Board) finds that:

1. The federal Clean Water Act (CWA) prohibits certain discharges of storm water containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit (Title 33 United States Code (U.S.C.) §§ 1311 and 1342(p); also referred to as Clean Water Act (CWA) §§ 301 and 402(p)). The U.S. Environmental Protection Agency (U.S. EPA) promulgates federal regulations to implement the CWA's mandate to control pollutants in storm water runoff discharges. (Title 40 Code of Federal Regulations (C.F.R.) Parts 122, 123, and 124). The federal statutes and regulations require discharges to surface waters comprised of storm water associated with construction activity, including demolition, clearing, grading, and excavation, and other land disturbance activities (except operations that result in disturbance of less than one acre of total land area and which are not part of a larger common plan of development or sale), to obtain coverage under an NPDES permit. The NPDES permit must require implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate pollutants in storm water runoff. The NPDES permit must also include additional requirements necessary to implement applicable water quality standards.

2. This General Permit authorizes discharges of storm water associated with construction activity so long as the dischargers comply with all requirements, provisions, limitations and prohibitions in the permit. In addition, this General Permit regulates the discharges of storm water associated with construction activities from all Linear

Underground/Overhead Projects resulting in the disturbance of greater than or equal to one acre (Attachment A).

3. This General Permit regulates discharges of pollutants in storm water associated with construction activity (storm water discharges) to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface.

4. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems or other watercourses within their jurisdictions.

5. This action to adopt a general NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, et seq.), pursuant to Section 13389 of the California Water Code.

6. Pursuant to 40 C.F.R. § 131.12 and State Water Board Resolution No. 68-16,[1] which incorporates the requirements of § 131.12 where applicable, the State Water Board finds that discharges in compliance with this General Permit will not result in the lowering of water quality standards, and are therefore consistent with those provisions. Compliance with this General Permit will result in improvements in water quality.

7. This General Permit serves as an NPDES permit in compliance with CWA § 402 and will take effect on July 1, 2010 by the State Water Board provided the Regional Administrator of the U.S. EPA has no objection. If the U.S. EPA Regional Administrator objects to its issuance, the General Permit will not become effective until such objection is withdrawn.

8. Following adoption and upon the effective date of this General Permit, the Regional Water Quality Control Boards (Regional Water Boards) shall enforce the provisions herein.

9. Regional Water Boards establish water quality standards in Basin Plans. The State Water Board establishes water quality standards in various statewide plans, including the California Ocean Plan. U.S. EPA establishes water quality standards in the National Toxic Rule (NTR) and the California Toxic Rule (CTR).

[1] Resolution No. 68-16 generally requires that existing water quality be maintained unless degradation is justified based on specific findings.

10. This General Permit does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.

11. The primary storm water pollutant at construction sites is excess sediment. Excess sediment can cloud the water, which reduces the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants such as nutrients, metals, and oils and greases.

12. Construction activities can impact a construction site's runoff sediment supply and transport characteristics. These modifications, which can occur both during and after the construction phase, are a significant cause of degradation of the beneficial uses established for water bodies in California. Dischargers can avoid these effects through better construction site design and activity practices.

13. This General Permit recognizes four distinct phases of construction activities. The phases are Grading and Land Development Phase, Streets and Utilities Phase, Vertical Construction Phase, and Final Landscaping and Site Stabilization Phase. Each phase has activities that can result in different water quality effects from different water quality pollutants. This General Permit also recognizes inactive construction as a category of construction site type.

14. Compliance with any specific limits or requirements contained in this General Permit does not constitute compliance with any other applicable requirements.

15. Following public notice in accordance with State and Federal laws and regulations, the State Water Board heard and considered all comments and testimony in a public hearing on 06/03/2009. The State Water Board has prepared written responses to all significant comments.

16. Construction activities obtaining coverage under the General Permit may have multiple discharges subject to requirements that are specific to general, linear, and/or active treatment system discharge types.

17. The State Water Board may reopen the permit if the U.S. EPA adopts a final effluent limitation guideline for construction activities.

B. Activities Covered Under the General Permit

18. Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

19. Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

20. Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to U.S. EPA regulations, such as dairy barns or food processing facilities.

21. Construction activity associated with Linear Underground/Overhead Utility Projects (LUPs) including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

22. Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.[2]

23. Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction sites that intend to disturb one or more acres of land within the jurisdictional boundaries of

[2] Pursuant to the Ninth Circuit Court of Appeals' decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the U.S. EPA's petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the site.

C. Activities Not Covered Under the General Permit

24. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

25. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.

26. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.

27. Construction activity and land disturbance involving discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction sites in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit.

28. Construction activity that disturbs less than one acre of land surface, and that is not part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

29. Construction activity covered by an individual NPDES Permit for storm water discharges.

30. Discharges from small (1 to 5 acre) construction activities with an approved Rainfall Erosivity Waiver authorized by U.S. EPA Phase II regulations certifying to the State Board that small construction activity will occur only when the Rainfall Erosivity Factor is less than 5 (“R” in the Revised Universal Soil Loss Equation).

31. Landfill construction activity that is subject to the Industrial General Permit.

32. Construction activity that discharges to Combined Sewer Systems.

33. Conveyances that discharge storm water runoff combined with municipal sewage.

34. Discharges of storm water identified in CWA § 402(*l*)(2), 33 U.S.C. § 1342(*l*)(2).

35. Discharges occurring in basins that are not tributary or hydrologically connected to waters of the United States (for more information contact your Regional Water Board).

D. Obtaining and Modifying General Permit Coverage

36. This General Permit requires all dischargers to electronically file all Permit Registration Documents (PRDs), Notices of Termination (NOT), changes of information, annual reporting, and other compliance documents required by this General Permit through the State Water Board's Storm water Multi-Application and Report Tracking System (SMARTS) website.

37. Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

38. This General Permit grants an exception from the Risk Determination requirements for existing sites covered under Water Quality Orders No. 99-08-DWQ, and No. 2003-0007-DWQ. For certain sites, adding additional requirements may not be cost effective. Construction sites covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at the Risk Level 1. LUPs covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage as a Type 1 LUP. The Regional Water Boards have the authority to require Risk Determination to be performed on sites currently covered under Water Quality Orders No. 99-08-DWQ and No. 2003-0007-DWQ where they deem it necessary. The State Water Board finds that there are two circumstances when it may be appropriate for the Regional Water Boards to require a discharger that had filed an NOI under State Water Board Order No. 99-08-DWQ to recalculate the site's risk level. These circumstances are: (1) when the discharger has a demonstrated history of noncompliance with State Water Board Order No. 99-08-DWQ or; (2) when the discharger's site poses a significant risk of causing or contributing to an exceedance of a water quality standard without the implementation of the additional Risk Level 2 or 3 requirements.

E. Prohibitions

39. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit. Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may

contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural Best Management Practices (BMPs)[3]. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction.

40. This General Permit prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

41. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the State Water Board and the nine Regional Water Boards.

42. Pursuant to the Ocean Plan, discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.

43. This General Permit prohibits the discharge of any debris[4] from construction sites. Plastic and other trash materials can cause negative impacts to receiving water beneficial uses. The State Water Board encourages the use of more environmentally safe, biodegradable materials on construction sites to minimize the potential risk to water quality.

F. Training

44. In order to improve compliance with and to maintain consistent enforcement of this General Permit, all dischargers are required to appoint two positions - the Qualified SWPPP Developer (QSD) and the Qualified SWPPP Practitioner (QSP) - who must obtain appropriate training. Together with the key stakeholders, the State and Regional Water Boards are leading the development of this curriculum through a collaborative organization called The Construction General Permit (CGP) Training Team.

45. The Professional Engineers Act (Bus. & Prof. Code section 6700, et seq.) requires that all engineering work must be performed by a California licensed engineer.

[3] BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

[4] Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

G. Determining and Reducing Risk

46. The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type.

47. This General Permit requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. This General Permit contains requirements for Risk Levels 1, 2 and 3, and LUP Risk Type 1, 2, and 3 (Attachment A). Risk levels are established by determining two factors: first, calculating the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e. grading and site stabilization). Both factors are used to determine the site-specific Risk Level(s). LUPs can be determined to be Type 1 based on the flowchart in Attachment A.1.

48. Although this General Permit does not mandate specific setback distances, dischargers are encouraged to set back their construction activities from streams and wetlands whenever feasible to reduce the risk of impacting water quality (e.g., natural stream stability and habitat function). Because there is a reduced risk to receiving waters when setbacks are used, this General Permit gives credit to setbacks in the risk determination and post-construction storm water performance standards. The risk calculation and runoff reduction mechanisms in this General Permit are expected to facilitate compliance with any Regional Water Board and local agency setback requirements, and to encourage voluntary setbacks wherever practicable.

49. Rain events can occur at any time of the year in California. Therefore, a Rain Event Action Plan (REAP) is necessary for Risk Level 2 and 3 traditional construction projects (LUPs exempt) to ensure that active construction sites have adequate erosion and sediment controls implemented prior to the onset of a storm event, even if construction is planned only during the dry season.

50. Soil particles smaller than 0.02 millimeters (mm) (i.e., finer than medium silt) do not settle easily using conventional measures for sediment control (i.e., sediment basins). Given their long settling time, dislodging these soils results in a significant risk that fine particles will be released into surface waters and cause unacceptable downstream impacts. If operated correctly, an Active Treatment System (ATS[5]) can prevent or reduce the release of fine particles from construction sites.

[5] An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electro coagulation in order to reduce turbidity caused by fine suspended sediment.

Use of an ATS can effectively reduce a site's risk of impacting receiving waters.

51. Dischargers located in a watershed area where a Total Maximum Daily Load (TMDL) has been adopted or approved by the Regional Water Board or U.S. EPA may be required by a separate Regional Water Board action to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. Such dischargers may also be required to obtain an individual Regional Water Board permit specific to the area.

H. Effluent Standards

52. The State Water Board convened a blue ribbon panel of storm water experts that submitted a report entitled, “The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities,” dated June 19, 2006. The panel concluded that numeric limits or action levels are technically feasible to control construction storm water discharges, provided that certain conditions are considered. The panel also concluded that numeric effluent limitations (NELs) are feasible for discharges from construction sites that utilize an ATS. The State Water Board has incorporated the expert panel’s suggestions into this General Permit, which includes numeric action levels (NALs) for pH and turbidity, and special numeric limits for ATS discharges.

Determining Compliance with Numeric Limitations

53. This General Permit sets a pH NAL of 6.5 to 8.5, and a turbidity NAL of 250 NTU. The purpose of the NAL and its associated monitoring requirement is to provide operational information regarding the performance of the measures used at the site to minimize the discharge of pollutants and to protect beneficial uses and receiving waters from the adverse effects of construction-related storm water discharges. An exceedance of a NAL does not constitute a violation of this General Permit.

54. This General Permit requires dischargers with NAL exceedances to immediately implement additional BMPs and revise their Storm Water Pollution Prevention Plans (SWPPPs) accordingly to either prevent pollutants and authorized non-storm water discharges from contaminating storm water, or to substantially reduce the pollutants to levels consistently below the NALs. NAL exceedances are reported in the State Water Boards SMARTS system, and the discharger is

required to provide an NAL Exceedance Report when requested by a Regional Water Board.

I. Receiving Water Limitations

55. This General Permit requires all enrolled dischargers to determine the receiving waters potentially affected by their discharges and to comply with all applicable water quality standards, including any more stringent standards applicable to a water body.

J. Sampling, Monitoring, Reporting and Record Keeping

56. Visual monitoring of storm water and non-storm water discharges is required for all sites subject to this General Permit.

57. Records of all visual monitoring inspections are required to remain on-site during the construction period and for a minimum of three years.

58. For all Risk Level 3/LUP Type 3 and Risk Level 2/LUP Type 2 sites, this General Permit requires effluent monitoring for pH and turbidity. Sampling, analysis and monitoring requirements for effluent monitoring for pH and turbidity are contained in this General Permit.

59. Risk Level 3 and LUP Type 3 sites with effluent that exceeds the Receiving Water Monitoring Triggers contained in this General Permit and with direct discharges to receiving water are required to conduct receiving water monitoring. An exceedance of a Receiving Water Monitoring Trigger does not constitute a violation of this General Permit.

60. This General Permit establishes a 5 year, 24 hour (expressed in inches of rainfall) as an exemptions to the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 dischargers.

61. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

62. For Risk Level 3 and LUP Type 3 sites larger than 30 acres and with direct discharges to receiving waters, this General Permit requires bioassessment sampling before and after site completion to determine if significant degradation to the receiving water's biota has occurred. Bioassessment sampling guidelines are contained in this General Permit.

63. A summary and evaluation of the sampling and analysis results will be submitted in the Annual Reports.

64. This General Permit contains sampling, analysis and monitoring requirements for non-visible pollutants at all sites subject to this General Permit.

65. Compliance with the General Permit relies upon dischargers to electronically self-report any discharge violations and to comply with any Regional Water Board enforcement actions.

66. This General Permit requires that all dischargers maintain a paper or electronic copy of all required records for three years from the date generated or date submitted, whichever is last. These records must be available at the construction site until construction is completed. For LUPs, these documents may be retained in a crew member's vehicle and made available upon request.

K. Active Treatment System (ATS) Requirements

67. Active treatment systems add chemicals to facilitate flocculation, coagulation and filtration of suspended sediment particles. The uncontrolled release of these chemicals to the environment can negatively affect the beneficial uses of receiving waters and/or degrade water quality (e.g., acute and chronic toxicity). Additionally, the batch storage and treatment of storm water through an ATS' can potentially cause physical impacts on receiving waters if storage volume is inadequate or due to sudden releases of the ATS batches and improperly designed outfalls.

68. If designed, operated and maintained properly an ATS can achieve very high removal rates of suspended sediment (measured as turbidity), albeit at sometimes significantly higher costs than traditional erosion/sediment control practices. As a result, this General Permit establishes NELs consistent with the expected level of typical ATS performance.

69. This General Permit requires discharges of storm water associated with construction activity that undergo active treatment to comply with special operational and effluent limitations to ensure that these discharges do not adversely affect the beneficial uses of the receiving waters or cause degradation of their water quality.

70. For ATS discharges, this General Permit establishes technology-based NELs for turbidity.

71. This General Permit establishes a 10 year, 24 hour (expressed in inches of rainfall) Compliance Storm Event exemption from the technology-based numeric effluent limitations for ATS discharges. Exceedances of the ATS turbidity NEL constitutes a violation of this General Permit.

L. Post-Construction Requirements

72. This General Permit includes performance standards for post-construction that are consistent with State Water Board Resolution No. 2005-0006, "Resolution Adopting the Concept of Sustainability as a Core Value for State Water Board Programs and Directing Its Incorporation," and 2008-0030, "Requiring Sustainable Water Resources Management." The requirement for all construction sites to match pre-project hydrology will help ensure that the physical and biological integrity of aquatic ecosystems are sustained. This "runoff reduction" approach is analogous in principle to Low Impact Development (LID) and will serve to protect related watersheds and waterbodies from both hydrologic-based and pollution impacts associated with the post-construction landscape.

73. LUP projects are not subject to post-construction requirements due to the nature of their construction to return project sites to pre-construction conditions.

M. Storm Water Pollution Prevention Plan Requirements

74. This General Permit requires the development of a site-specific SWPPP. The SWPPP must include the information needed to demonstrate compliance with all requirements of this General Permit, and must be kept on the construction site and be available for review. The discharger shall ensure that a QSD develops the SWPPP.

75. To ensure proper site oversight, this General Permit requires a Qualified SWPPP Practitioner to oversee implementation of the BMPs required to comply with this General Permit.

N. Regional Water Board Authorities

76. Regional Water Boards are responsible for implementation and enforcement of this General Permit. A general approach to permitting is not always suitable for every construction site and environmental circumstances. Therefore, this General Permit recognizes that Regional Water Boards must have some flexibility and authority to alter, approve, exempt, or rescind permit authority granted under this

General Permit in order to protect the beneficial uses of our receiving waters and prevent degradation of water quality.

IT IS HEREBY ORDERED that all dischargers subject to this General Permit shall comply with the following conditions and requirements (including all conditions and requirements as set forth in Attachments A, B, C, D, E and F)[6]:

II. CONDITIONS FOR PERMIT COVERAGE

A. Linear Underground/Overhead Projects (LUPs)

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g. telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.

2. The Legally Responsible Person is responsible for obtaining coverage under the General Permit where the construction of pipelines, utility lines, fiber-optic cables, or other linear underground/overhead projects will occur across several properties unless the LUP construction activities are covered under another construction storm water permit.

3. Only LUPs shall comply with the conditions and requirements in Attachment A, A.1 & A.2 of this Order. The balance of this Order is not applicable to LUPs except as indicated in Attachment A.

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[6] These attachments are part of the General Permit itself and are not separate documents that are capable of being updated independently by the State Water Board.

B. Obtaining Permit Coverage Traditional Construction Sites

1. The Legally Responsible Person (LRP) (see Special Provisions, Electronic Signature and Certification Requirements, Section IV.I.1) must obtain coverage under this General Permit.

2. To obtain coverage, the LRP must electronically file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.

3. PRDs shall consist of:

   a. Notice of Intent (NOI)
   b. Risk Assessment (Section VIII)
   c. Site Map
   d. Storm Water Pollution Prevention Plan (Section XIV)
   e. Annual Fee
   f. Signed Certification Statement

   Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

   Attachment B contains additional PRD information. Dischargers must electronically file the PRDs, and mail the appropriate annual fee to the State Water Board.

4. This permit is effective on July 1, 2010.

   a. **Dischargers Obtaining Coverage On or After July 1, 2010:** All dischargers requiring coverage on or after July 1, 2010, shall electronically file their PRDs prior to the commencement of construction activities, and mail the appropriate annual fee no later than seven days prior to the commencement of construction activities. Permit coverage shall not commence until the PRDs and the annual fee are received by the State Water Board, and a WDID number is assigned and sent by SMARTS.

   b. **Dischargers Covered Under 99-08-DWQ and 2003-0007-DWQ:** Existing dischargers subject to State Water Board Order No. 99-08-DWQ (existing dischargers) will continue coverage under 99-08-DWQ until July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 99-08-DWQ will be terminated.

Existing dischargers shall electronically file their PRDs no later than July 1, 2010. If an existing discharger's site acreage subject to the annual fee has changed, it shall mail a revised annual fee no less than seven days after receiving the revised annual fee notification, **or else lose permit coverage**. All existing dischargers shall be exempt from the risk determination requirements in Section VIII of this General Permit until two years after permit adoption. All existing dischargers are therefore subject to Risk Level 1 requirements regardless of their site's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the Section VIII risk determination requirements.

5. The discharger is only considered covered by this General Permit upon receipt of a Waste Discharger Identification (WDID) number assigned and sent by the State Water Board Storm water Multi-Application and Report Tracking System (SMARTS). In order to demonstrate compliance with this General Permit, the discharger must obtain a WDID number and must present documentation of a valid WDID upon demand.

6. During the period this permit is subject to review by the U.S. EPA, the prior permit (State Water Board Order No. 99-08-DWQ) remains in effect. Existing dischargers under the prior permit will continue to have coverage under State Water Board Order No. 99-08-DWQ until this General Permit takes effect on July 1, 2010. Dischargers who complete their projects and electronically file an NOT prior to July 1, 2010, are not required to obtain coverage under this General Permit.

7. Small Construction Rainfall Erosivity Waiver

   EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

   Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

   If a small construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

8. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

C. Revising Permit Coverage for Change of Acreage or New Ownership

1. The discharger may reduce or increase the total acreage covered under this General Permit when a portion of the site is complete and/or conditions for termination of coverage have been met (See Section II.D Conditions for Termination of Coverage); when ownership of a portion of the site is sold to a different entity; or when new acreage, subject to this General Permit, is added to the site.

2. Within 30 days of a reduction or increase in total disturbed acreage, the discharger shall electronically file revisions to the PRDs that include:

   a. A revised NOI indicating the new project size;

   b. A revised site map showing the acreage of the site completed, acreage currently under construction, acreage sold/transferred or added, and acreage currently stabilized in accordance with the Conditions for Termination of Coverage in Section II.D below.

   c. SWPPP revisions, as appropriate; and

   d. Certification that any new landowners have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address of the new landowner.

   e. If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

3. The discharger shall continue coverage under the General Permit for any parcel that has not achieved “Final Stabilization” as defined in Section II.D.

4. When an LRP with active General Permit coverage transfers its LRP status to another person or entity that qualifies as an LRP, the existing LRP shall inform the new LRP of the General Permit’s requirements. In order for the new LRP to continue the construction activity on its parcel of property, the new LRP, or the new LRP’s approved signatory, must submit PRDs in accordance with this General Permit’s requirements.

D. Conditions for Termination of Coverage

1. Within 90 days of when construction is complete or ownership has been transferred, the discharger shall electronically file a Notice of Termination (NOT), a final site map, and photos through the State Water Boards SMARTS system. Filing a NOT certifies that all General Permit requirements have been met. The Regional Water Board will consider a construction site complete only when all portions of the site have been transferred to a new owner, or all of the following conditions have been met:

   a. For purposes of “final stabilization,” the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;

   b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;

   c. Final stabilization has been reached;

   d. Construction materials and wastes have been disposed of properly;

   e. Compliance with the Post-Construction Standards in Section XIII of this General Permit has been demonstrated;

   f. Post-construction storm water management measures have been installed and a long-term maintenance plan[7] has been established; and

   g. All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site.

[7] For the purposes of this requirement a long-term maintenance plan will be designed for a minimum of five years, and will describe the procedures to ensure that the post-construction storm water management measures are adequately maintained.

2. The discharger shall certify that final stabilization conditions are satisfied in their NOT. Failure to certify shall result in continuation of permit coverage and annual billing.

3. The NOT must demonstrate through photos, RUSLE or RUSLE2, or results of testing and analysis that the site meets all of the conditions above (Section II.D.1) and the final stabilization condition (Section II.D.1.a) is attained by one of the following methods:

   a. “70% final cover method,” no computational proof required

      OR:

   b. “RUSLE or RUSLE2 method,” computational proof required

      OR:

   c. “Custom method”, the discharger shall demonstrate in some other manner than a or b, above, that the site complies with the “final stabilization” requirement in Section II.D.1.a.

III. DISCHARGE PROHIBITIONS

A. Dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.

B. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit.

C. Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. The discharge of non-storm water is authorized under the following conditions:

1. The discharge does not cause or contribute to a violation of any water quality standard;
2. The discharge does not violate any other provision of this General Permit;
3. The discharge is not prohibited by the applicable Basin Plan;
4. The discharger has included and implemented specific BMPs required by this General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.
5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
6. The discharge is monitored and meets the applicable NALs; and
7. The discharger reports the sampling information in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not already authorized by this General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

D. Debris resulting from construction activities are prohibited from being discharged from construction sites.

E. When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

IV. SPECIAL PROVISIONS

A. Duty to Comply

1. The discharger shall comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.

2. The discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

B. General Permit Actions

1. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

2. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

C. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

D. Duty to Mitigate

The discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance

The discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

F. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

G. Duty to Maintain Records and Provide Information

1. The discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be available at the construction site until construction is completed.

2. The discharger shall furnish the Regional Water Board, State Water Board, or U.S. EPA, within a reasonable time, any requested information to determine compliance with this General Permit. The discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

H. Inspection and Entry

The discharger shall allow the Regional Water Board, State Water Board, U.S. EPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the discharger’s premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

2. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;

3. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and

4. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

I. Electronic Signature and Certification Requirements

1. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.

2. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or together with any reports, information or applications to be signed by an Approved Signatory.

3. All Annual Reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, U.S. EPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

J. Certification

Any person signing documents under Section IV.I above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

K. Anticipated Noncompliance

The discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

L. Bypass

Bypass[8] is prohibited. The Regional Water Board may take enforcement action against the discharger for bypass unless:

1. Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;[9]

2. There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that could occur during normal periods of equipment downtime or preventative maintenance;

3. The discharger submitted a notice at least ten days in advance of the need for a bypass to the Regional Water Board; or

4. The discharger may allow a bypass to occur that does not cause effluent limitations to be exceeded, but only if it is for essential maintenance to assure efficient operation. In such a case, the above bypass conditions are not applicable. The discharger shall submit notice of an unanticipated bypass as required.

M. Upset

1. A discharger that wishes to establish the affirmative defense of an upset[10] in an action brought for noncompliance shall demonstrate,

[8] The intentional diversion of waste streams from any portion of a treatment facility

[9] Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

[10] An exceptional incident in which there is unintentional and temporary noncompliance the technology based numeric effluent limitations because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and that the discharger can identify the cause(s) of the upset

b. The treatment facility was being properly operated by the time of the upset

c. The discharger submitted notice of the upset as required; and

d. The discharger complied with any remedial measures required

2. No determination made before an action of noncompliance occurs, such as during administrative review of claims that noncompliance was caused by an upset, is final administrative action subject to judicial review.

3. In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof

N. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years or by both.

O. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the discharger is or may be subject to under Section 311 of the CWA.

P. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

Q. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

R. Penalties for Violations of Permit Conditions

1. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed $37,500[11] per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.

2. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

S. Transfers

This General Permit is not transferable.

T. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

[11] May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act.

V. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

A. Narrative Effluent Limitations

1. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

2. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

Table 1- Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		Risk Level 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2	1	NTU	250 NTU
		Risk Level 3			250 NTU

B. Numeric Action Levels (NALs)

1. For Risk Level 2 and 3 dischargers, the lower storm event average NAL for pH is 6.5 pH units and the upper storm event average NAL for

pH is 8.5 pH units. The discharger shall take actions as described below if the discharge is outside of this range of pH values.

2. For Risk Level 2 and 3 dischargers, the NAL storm event daily average for turbidity is 250 NTU. The discharger shall take actions as described below if the discharge is outside of this range of turbidity values.

3. Whenever the results from a storm event daily average indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.

4. The site evaluation shall be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:

   a. Are related to the construction activities and whether additional BMPs are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

      AND/OR:

   b. Are related to the run-on associated with the construction site location and whether additional BMPs measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) what corrective action(s) were taken or will be taken with a description of the schedule for completion.

C. Receiving Water Monitoring Triggers

1. The receiving water monitoring triggers for Risk Level 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge[12] fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

2. Risk Level 3 dischargers with with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this general permit.

3. Risk Level 3 dischargers with direct discharges to surfaces waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif

   Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

4. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

[12] A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

VI. RECEIVING WATER LIMITATIONS

A. The discharger shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.

B. The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.

C. The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).

D. Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL has been approved by the U.S. EPA, shall comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of the pollution.

VII. TRAINING QUALIFICATIONS AND CERTIFICATION REQUIREMENTS

A. General

The discharger shall ensure that all persons responsible for implementing requirements of this General Permit shall be appropriately trained in accordance with this Section. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Those responsible for preparing and amending SWPPPs shall comply with the requirements in this Section VII.

The discharger shall provide documentation of all training for persons responsible for implementing the requirements of this General Permit in the Annual Reports.

B. SWPPP Certification Requirements

1. **Qualified SWPPP Developer:** The discharger shall ensure that SWPPPs are written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:

    a. A California registered professional civil engineer;

    b. A California registered professional geologist or engineering geologist;

    c. A California registered landscape architect;

    d. A professional hydrologist registered through the American Institute of Hydrology;

    e. A Certified Professional in Erosion and Sediment Control (CPESC) ™ registered through Enviro Cert International, Inc.;

    f. A Certified Professional in Storm Water Quality (CPSWQ) ™ registered through Enviro Cert International, Inc.; or

    g. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

2. The discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.

3. **Qualified SWPPP Practitioner:** The discharger shall ensure that all BMPs required by this General Permit are implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:

   a. A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or

   b. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

   Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

4. The LRP shall list in the SWPPP, the name of any Approved Signatory, and provide a copy of the written agreement or other mechanism that provides this authority from the LRP in the SWPPP.

5. The discharger shall include, in the SWPPP, a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.

6. The discharger shall ensure that the SWPPP and each amendment will be signed by the Qualified SWPPP Developer. The discharger shall include a listing of the date of initial preparation and the date of each amendment in the SWPPP.

VIII. RISK DETERMINATION

The discharger shall calculate the site's sediment risk and receiving water risk during periods of soil exposure (i.e. grading and site stabilization) and use the calculated risks to determine a Risk Level(s) using the methodology in

Appendix 1. For any site that spans two or more planning watersheds,[13] the discharger shall calculate a separate Risk Level for each planning watershed. The discharger shall notify the State Water Board of the site's Risk Level determination(s) and shall include this determination as a part of submitting the PRDs. If a discharger ends up with more than one Risk Level determination, the Regional Water Board may choose to break the project into separate levels of implementation.

IX. RISK LEVEL 1 REQUIREMENTS

Risk Level 1 Dischargers shall comply with the requirements included in Attachment C of this General Permit.

X. RISK LEVEL 2 REQUIREMENTS

Risk Level 2 Dischargers shall comply with the requirements included in Attachment D of this General Permit.

XI. RISK LEVEL 3 REQUIREMENTS

Risk Level 3 Dischargers shall comply with the requirements included in Attachment E of this General Permit.

XII. ACTIVE TREATMENT SYSTEMS (ATS)

Dischargers choosing to implement an ATS on their site shall comply with all of the requirements in Attachment F of this General Permit.

[13] Planning watershed: defined by the Calwater Watershed documents as a watershed that ranges in size from approximately 3,000 to 10,000 acres http://cain.ice.ucdavis.edu/calwater/calwfaq.html, http://gis.ca.gov/catalog/BrowseRecord.epl?id=22175 .

XIII. POST-CONSTRUCTION STANDARDS

A. All dischargers shall comply with the following runoff reduction requirements unless they are located within an area subject to post-construction standards of an active Phase I or II municipal separate storm sewer system (MS4) permit that has an approved Storm Water Management Plan.

1. This provision shall take effect three years from the adoption date of this permit, or later at the discretion of the Executive Officer of the Regional Board.

2. The discharger shall demonstrate compliance with the requirements of this section by submitting with their NOI a map and worksheets in accordance with the instructions in Appendix 2. The discharger shall use non-structural controls unless the discharger demonstrates that non-structural controls are infeasible or that structural controls will produce greater reduction in water quality impacts.

3. The discharger shall, through the use of non-structural and structural measures as described in Appendix 2, replicate the pre-project water balance (for this permit, defined as the volume of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event (or the smallest storm event that generates runoff, whichever is larger). Dischargers shall inform Regional Water Board staff at least 30 days prior to the use of any structural control measure used to comply with this requirement. Volume that cannot be addressed using non-structural practices shall be captured in structural practices and approved by the Regional Water Board. When seeking Regional Board approval for the use of structural practices, dischargers shall document the infeasibility of using non-structural practices on the project site, or document that there will be fewer water quality impacts through the use of structural practices.

4. For sites whose disturbed area exceeds two acres, the discharger shall preserve the pre-construction drainage density (miles of stream length per square mile of drainage area) for all drainage areas within the area serving a first order stream[14] or larger stream and ensure that post-project time of runoff concentration is equal or greater than pre-project time of concentration.

[14] A first order stream is defined as a stream with no tributaries.

B. All dischargers shall implement BMPs to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site (Post-construction BMPs).

XIV. SWPPP REQUIREMENTS

A. The discharger shall ensure that the Storm Water Pollution Prevention Plans (SWPPPs) for all traditional project sites are developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:

1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;

2. Where not otherwise required to be under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;

3. Site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the BAT/BCT standard;

4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and

5. Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.

B. To demonstrate compliance with requirements of this General Permit, the QSD shall include information in the SWPPP that supports the conclusions, selections, use, and maintenance of BMPs.

C. The discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

XV. REGIONAL WATER BOARD AUTHORITIES

A. In the case where the Regional Water Board does not agree with the discharger's self-reported risk level (e.g., they determine themselves to be a Level 1 Risk when they are actually a Level 2 Risk site), Regional Water Boards may either direct the discharger to reevaluate the Risk Level(s) for their site or terminate coverage under this General Permit.

B. Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.

C. Regional Water Boards may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.

D. Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.

E. Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

XVI. ANNUAL REPORTING REQUIREMENTS

A. All dischargers shall prepare and electronically submit an Annual Report no later than September 1 of each year.

B. The discharger shall certify each Annual Report in accordance with the Special Provisions.

C. The discharger shall retain an electronic or paper copy of each Annual Report for a minimum of three years after the date the annual report is filed.

D. The discharger shall include storm water monitoring information in the Annual Report consisting of:

1. a summary and evaluation of all sampling and analysis results, including copies of laboratory reports;

2. the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");

3. a summary of all corrective actions taken during the compliance year;

4. identification of any compliance activities or corrective actions that were not implemented;

5. a summary of all violations of the General Permit;

6. the names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;

7. the date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and

8. the visual observation and sample collection exception records and reports specified in Attachments C, D, and E.

E. The discharger shall provide training information in the Annual Report consisting of:

1. documentation of all training for individuals responsible for all activities associated with compliance with this General Permit;

2. documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and

3. documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

ATTACHMENT A
Linear Underground/ Overhead Requirements

All Linear Underground/Overhead project dischargers who submit permit registration documents (PRDs) indicating their intention to be regulated under the provisions of this General Permit shall comply with the following:

A. DEFINITION OF LINEAR UNDERGROUND/OVERHEAD PROJECTS

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquiescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

2. LUP evaluation shall consist of two tasks:

a. Confirm that the project or project section(s) qualifies as an LUP. The State Water Board website contains a project determination guidance flowchart. http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

b. Identify which Type(s) (1, 2 or 3 described in Section I below) are applicable to the project or project sections based on project sediment and receiving water risk. (See Attachment A.1)

3. A Legally Responsible Person (LRP) for a Linear Underground/Overhead project is required to obtain CGP coverage under one or more permit registration document (PRD) electronic submittals to the State Water Board's Storm Water Multi-Application and Report Tracking (SMARTs) system. Attachment A.1 contains a flow chart to be used when determining if a linear project qualifies for coverage and to determine LUP Types. Since a LUP may be constructed within both developed and undeveloped locations and portions of LUPs may be constructed by different contractors, LUPs may be broken into logical permit sections. Sections may be determined based on portions of a project conducted by one contractor. Other situations may also occur, such as the time period in which the sections of a project will be constructed (e.g. project phases), for which separate permit coverage is possible. For projects that are broken into separate sections, a description of how each section relates to the overall project and the definition of the boundaries between sections shall be clearly stated.

4. Where construction activities transverse or enter into different Regional Water Board jurisdictions, LRPs shall obtain permit coverage for each Regional Water Board area involved prior to the commencement of construction activities.

5. Small Construction Rainfall Erosivity Waiver

EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

If a small linear construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

B. LINEAR PROJECT PERMIT REGISTRATION DOCUMENTS (PRDs)

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted. PRDs shall consist of the following:

1. Notice of Intent (NOI)

Prior to construction activities, the LRP of a proposed linear underground/overhead project shall utilize the processes and methods provided in Attachment A.2, Permit Registration Documents (PRDs) – General Instructions for Linear Underground/Overhead Projects to comply with the Construction General Permit.

2. Site Maps

LRPs submitting PRDs shall include at least 3 maps. The first map will be a zoomed[1] 1000-1500 ft vicinity map that shows the starting point of the project. The second will be a zoomed map of 1000-1500 ft showing the ending location of the project. The third will be a larger view vicinity map, 1000 ft to 2000 ft, displaying the entire project location depending on the project size, and indicating the LUP type (1, 2 or 3) areas within the total project footprint.

3. Drawings

LRPs submitting PRDs shall include a construction drawing(s) or other appropriate drawing(s) or map(s) that shows the locations of storm drain

[1] An image with a close-up/enhanced detailed view of site features that show minute details such as streets and neighboring structures.
Or: An image with a close-up/enhanced detailed view of the site's surrounding infrastructure.
Or: An image with a close up detailed view of the project and its surroundings.

inlets and waterbodies[2] that may receive discharges from the construction activities and that shows the locations of BMPs to be installed for all those BMPs that can be illustrated on the revisable drawing(s) or map(s). If storm drain inlets, waterbodies, and/or BMPs cannot be adequately shown on the drawing(s) or map(s) they should be described in detail within the SWPPP.

4. Storm Water Pollution Prevention Plan (SWPPP)

LUP dischargers shall comply with the SWPPP Preparation, Implementation, and Oversight requirements in Section K of this Attachment.

5. Contact information

LUP dischargers shall include contact information for all contractors (or subcontractors) responsible for each area of an LUP project. This should include the names, telephone numbers, and addresses of contact personnel. Specific areas of responsibility of each contact, and emergency contact numbers should also be included.

6. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

C. LINEAR PROJECT TERMINATION OF COVERAGE REQUIREMENTS

The LRP may terminate coverage of an LUP when construction activities are completed by submitting an electronic notice of termination (NOT) through the State Water Board's SMARTS system. Termination requirements are different depending on the complexity of the LUP. An LUP is considered complete when: (a) there is no potential for construction-related storm water pollution; (b) all elements of the SWPPP have been completed; (c) construction materials and waste have been disposed of properly; (d) the site is in compliance with all local storm water management requirements; and (e) the LRP submits a notice of termination (NOT) and has received approval for termination from the appropriate Regional Water Board office.

1. LUP Stabilization Requirements

The LUP discharger shall ensure that all disturbed areas of the construction site are stabilized prior to termination of coverage under this General Permit. Final stabilization for the purposes of submitting an NOT

[2] Includes basin(s) that the MS4 storm sewer systems may drain to for Hydromodification or Hydrological Conditional of Concerns under the MS4 permits.

is satisfied when all soil disturbing activities are completed and one of the following criteria is met:

a. In disturbed areas that were vegetated prior to construction activities of the LUP, the area disturbed must be re-established to a uniform vegetative cover equivalent to 70 percent coverage of the preconstruction vegetative conditions. Where preconstruction vegetation covers less than 100 percent of the surface, such as in arid areas, the 70 percent coverage criteria is adjusted as follows: if the preconstruction vegetation covers 50 percent of the ground surface, 70 percent of 50 percent (.70 X .50=.35) would require 35 percent total uniform surface coverage; or

b. Where no vegetation is present prior to construction, the site is returned to its original line and grade and/or compacted to achieve stabilization; or

c. Equivalent stabilization measures have been employed. These measures include, but are not limited to, the use of such BMPs as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments.

2. LUP Termination of Coverage Requirements

The LRP shall file an NOT through the State Water Board's SMARTS system. By submitting an NOT, the LRP is certifying that construction activities for an LUP are complete and that the project is in full compliance with requirements of this General Permit and that it is now compliant with soil stabilization requirements where appropriate. Upon approval by the appropriate Regional Water Board office, permit coverage will be terminated.

3. Revising Coverage for Change of Acreage

When the LRP of a portion of an LUP construction project changes, or when a phase within a multi-phase project is completed, the LRP may reduce the total acreage covered by this General Permit. In reducing the acreage covered by this General Permit, the LRP shall electronically file revisions to the PRDs that include:

a. a revised NOI indicating the new project size;

b. a revised site map showing the acreage of the project completed, acreage currently under construction, acreage sold, transferred or added, and acreage currently stabilized.

c. SWPPP revisions, as appropriate; and

d. certification that any new LRPs have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address (if known) of the new LRP.

If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

D. DISCHARGE PROHIBITIONS

1. LUP dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.

2. LUP dischargers are prohibited from discharging non-storm water that is not otherwise authorized by this General Permit. Non-storm water discharges authorized by this General Permit[3] may include, fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, street cleaning, dewatering,[4] uncontaminated groundwater from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. Such discharges are allowed by this General Permit provided they are not relied upon to clean up failed or inadequate construction or post-construction BMPs designed to keep materials on site. These authorized non-storm water discharges:

[3] Dischargers must identify all authorized non-storm water discharges in the LUP's SWPPP and identify BMPs that will be implemented to either eliminate or reduce pollutants in non-storm water discharges. Regional Water Boards may direct the discharger to discontinue discharging such non-storm water discharges if determined that such discharges discharge significant pollutants or threaten water quality.
[4] Dewatering activities may be prohibited or need coverage under a separate permit issued by the Regional Water Boards. Dischargers shall check with the appropriate Regional Water Boards for any required permit or basin plan conditions prior to initial dewatering activities to land, storm drains, or waterbodies.

a. Shall not cause or contribute to a violation of any water quality standard;

b. Shall not violate any other provision of this General Permit;

c. Shall not violate any applicable Basin Plan;

d. Shall comply with BMPs as described in the SWPPP;

e. Shall not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;

f. Shall be monitored and meets the applicable NALs; and

g. Shall be reported by the discharger in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not authorized by this General Permit to determine the need for a separate NPDES permit.

Additionally, some LUP dischargers may be required to obtain a separate permit if the applicable Regional Water Board has adopted a General Permit for dewatering discharges. Wherever feasible, alternatives, that do not result in the discharge of non-storm water, shall be implemented in accordance with this Attachment's Section K.2 - SWPPP Implementation Schedule.

3. LUP dischargers shall ensure that trench spoils or any other soils disturbed during construction activities that are contaminated[5] are not discharged with storm water or non-storm water discharges into any storm drain or water body except pursuant to an NPDES permit.

When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the LUP discharger shall have those soils sampled and tested to ensure that proper handling and public safety measures are

[5] Contaminated soil contains pollutants in concentrations that exceed the appropriate thresholds that various regulatory agencies set for those substances. Preliminary testing of potentially contaminated soils will be based on odor, soil discoloration, or prior history of the site's chemical use and storage and other similar factors. When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The legally responsible person will notify the appropriate local, State, or federal agency(ies) when contaminated soil is found at a construction site, and will notify the Regional Water Board by submitting an NOT at the completion of the project.

implemented. The LUP discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

4. Discharging any pollutant-laden water that will cause or contribute to an exceedance of the applicable Regional Water Board's Basin Plan from a dewatering site or sediment basin into any receiving water or storm drain is prohibited.

5. Debris[6] resulting from construction activities are prohibited from being discharged from construction project sites.

E. SPECIAL PROVISIONS

1. Duty to Comply

a. The LUP discharger must comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.

b. The LUP discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

2. General Permit Actions

a. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

[6] Litter, rubble, discarded refuse, and remains of something destroyed.

b. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an LUP discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

4. Duty to Mitigate

The LUP discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

The LUP discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit and with the requirements of the Storm Water Pollution Prevention Plan (SWPPP). Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

6. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

7. Duty to Maintain Records and Provide Information

a. The LUP discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be kept at the construction site or in a crew member's vehicle until construction is completed, and shall be made available upon request.

b. The LUP discharger shall furnish the Regional Water Board, State Water Board, or USEPA, within a reasonable time, any requested information to determine compliance with this General Permit. The LUP discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

8. Inspection and Entry

The LUP discharger shall allow the Regional Water Board, State Water Board, USEPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

b. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;

c. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and

d. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

9. Electronic Signature and Certification Requirements

a. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.

b. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or together with any reports, information or applications to be signed by an Approved Signatory.

c. All SWPPP revisions, annual reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, USEPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

10. Certification

Any person signing documents under Section E.9 above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

11. Anticipated Noncompliance

The LUP discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

12. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years or by both.

13. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the LUP discharger is or may be subject to under Section 311 of the CWA.

14. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

15. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

16. Penalties for Violations of Permit Conditions

a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed $37,500[7] per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.

b. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

17. Transfers

This General Permit is not transferable. A new LRP of an ongoing construction activity must submit PRDs in accordance with the requirements of this General Permit to be authorized to discharge under this General Permit. An LRP who is a property owner with active General Permit coverage who sells a fraction or all the land shall inform the new property owner(s) of the requirements of this General Permit.

18. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those

[7] May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act

dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

F. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

1. Narrative Effluent Limitations

a. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges regulated by this General Permit do not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

b. LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of structural or non-structural controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

Table 1. Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	LUP Type 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		LUP Type 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	LUP Type 2	1	NTU	250 NTU
		LUP Type 3			250 NTU

2. Numeric Action Levels (NALs)

a. For LUP Type 2 and 3 dischargers, the lower storm event daily average NAL for pH is 6.5 pH units and the upper storm event daily average NAL for pH is 8.5 pH units. The LUP discharger shall take actions as described below if the storm event daily average discharge is outside of this range of pH values.

b. For LUP Type 2 and 3 dischargers, the storm event daily average NAL for turbidity is 250 NTU. The discharger shall take actions as described below if the storm event daily average discharge is outside of this range of turbidity values.

c. Whenever daily average analytical effluent monitoring results indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the LUP discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.

d. The site evaluation will be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:

   i Are related to the construction activities and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

   AND/OR:

   ii Are related to the run-on associated with the construction site location and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) decide what corrective action(s) were taken or will be taken, including a description of the schedule for completion.

3. Receiving Water Monitoring Triggers

a. The receiving water monitoring triggers for LUP Type 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge[8] fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

b. LUP Type 3 dischargers with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this General Permit.

c. LUP Type 3 dischargers with direct discharges to surfaces waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif

   Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

d. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

G. RECEIVING WATER LIMITATIONS

1. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.

2. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.

3. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or

[8] A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).

H. TRAINING QUALIFICATIONS

1. General

All persons responsible for implementing requirements of this General Permit shall be appropriately trained. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Persons responsible for preparing, amending and certifying SWPPPs shall comply with the requirements in this Section H.

2. SWPPP Certification Requirements

a. **Qualified SWPPP Developer:** The LUP discharger shall ensure that all SWPPPs be written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:

i A California registered professional civil engineer;

ii A California registered professional geologist or engineering geologist;

iii A California registered landscape architect;

iv A professional hydrologist registered through the American Institute of Hydrology;

v A certified professional in erosion and sediment control (CPESC) ™ registered through Enviro Cert International, Inc;

vi A certified professional in storm water quality (CPSWQ)™ registered through Enviro Cert International, Inc.; or

vii A certified professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

b. The LUP discharger shall ensure that the SWPPP is written and amended, as needed, to address the specific circumstances for each construction site covered by this General Permit prior to commencement of construction activity for any stage.

c. The LUP discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.

d. **Qualified SWPPP Practitioner:** The LUP discharger shall ensure that all elements of any SWPPP for each project will be implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis, and for ensuring full compliance with the permit and implementation of all elements of the SWPPP. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:

   i A certified erosion, sediment and storm water inspector registered through Certified Professional in Erosion and Sediment Control, Inc.; or

   ii A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

   Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

e. The LUP discharger shall ensure that the SWPPP include a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner, and who is ultimately responsible for implementation of the SWPPP. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.

f. The LUP discharger shall ensure that the SWPPP and each amendment be signed by the Qualified SWPPP Developer. The LUP discharger shall include a listing of the date of initial preparation and the dates of each amendment in the SWPPP.

I. TYPES OF LINEAR PROJECTS

This attachment establishes three types (Type 1, 2 & 3) of complexity for areas within an LUP or project section based on threat to water quality. Project area Types are determined through Attachment A.1.

The Type 1 requirements below establish the baseline requirements for all LUPs subject to this General Permit. Additional requirements for Type 2 and Type 3 LUPs are labeled.

1. Type 1 LUPs*:*

LUP dischargers with areas of a LUP designated as Type 1 shall comply with the requirements in this Attachment. Type 1 LUPs are:

a. Those construction areas where 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day; or

b. Where greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:

   i Areas disturbed during construction will be returned to preconstruction conditions or equivalent protection is established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and

   ii Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization BMPs will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.

c. Where the risk determination is as follows:

   i Low sediment risk, low receiving water risk, or

   ii Low sediment risk, medium receiving water risk, or

   iii Medium sediment risk, low receiving water risk

2. **Type 2 LUPs**:

   Type 2 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 2 LUPs have the specified combination of risk:

   d. High sediment risk, low receiving water risk, or

   e. Medium sediment risk, medium receiving water risk, or

   f. Low sediment risk, high receiving water risk

   Receiving water risk is either considered “Low” for those areas of the project that are not in close proximity to a sensitive receiving watershed, “Medium” for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, and “High” where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C of this General Permit.

3. **Type 3 LUPs:**

   Type 3 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 3 LUPs have the specified combination of risk:

   a. High sediment risk, high receiving water risk, or

   b. High sediment risk, medium receiving water risk, or

   c. Medium sediment risk, high receiving water risk

   Receiving water risk is either considered “Medium” for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, or “High” where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C.

J. LUP TYPE-SPECIFIC REQUIREMENTS

1. **Effluent Standards**

   a. Narrative – LUP dischargers shall comply with the narrative effluent standards below.

i Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

ii LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

b. Numeric – LUP Type 1 dischargers are not subject to a numeric effluent standard

c. Numeric –LUP Type 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

d. Numeric – LUP Type 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

2. Good Site Management "Housekeeping"

a. LUP dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, the good housekeeping measures shall consist of the following:

i Identify the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

ii Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

iii Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

iv Minimize exposure of construction materials to precipitation (not applicable to materials designed to be outdoors and exposed to the environment).

v Implement BMPs to control the off-site tracking of loose construction and landscape materials.

b. LUP dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

i Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

ii Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

iii Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

iv Cover waste disposal containers at the end of every business day and during a rain event.

v Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

vi Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

vii Implement procedures that effectively address hazardous and non-hazardous spills.

viii Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

(1) Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

(2) Appropriate spill response personnel are assigned and trained.

ix Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

c. LUP dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   i Prevent oil, grease, or fuel from leaking into the ground, storm drains or surface waters.

   ii Implement appropriate BMPs whenever equipment or vehicles are fueled, maintained or stored.

   iii Clean leaks immediately and disposing of leaked materials properly.

d. LUP dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   i Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   ii Contain fertilizers and other landscape materials when they are not actively being used.

   iii Discontinue the application of any erodible landscape material at least 2 days before a forecasted rain event[9] or during periods of precipitation.

   iv Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   v Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.

e. LUP dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, LUP dischargers shall do the following:

[9] 50% or greater chance of producing precipitation.

i Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

ii Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

iii Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

iv Ensure retention of sampling, visual observation, and inspection records.

v Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

f. LUP dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations.

3. Non-Storm Water Management

a. LUP dischargers shall implement measures to control all non-storm water discharges during construction.

b. LUP dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

c. LUP dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

4. Erosion Control

a. LUP dischargers shall implement effective wind erosion control.

b. LUP dischargers shall provide effective soil cover for inactive[10] areas and all finished slopes, and utility backfill.

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[10] Areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days

c. LUP dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

5. Sediment Controls

a. LUP dischargers shall establish and maintain effective perimeter controls as needed, and implement effective BMPs for all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

b. On sites where sediment basins are to be used, LUP dischargers shall, at minimum, design sediment basins according to the guidance provided in CASQA's Construction BMP Handbook.

c. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[11] in accordance with Table 2 below.

Table 2 – Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

d. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent off-site tracking of sediment.

e. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

f. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall inspect all immediate access roads. At a minimum daily and prior to any rain event, the discharger shall remove any

[11] Sheet flow length is the length that shallow, low velocity flow travels across a site.

sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

g. **Additional LUP Type 3 Requirement:** The Regional Water Board may require LUP Type 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

6. Run-on and Run-off Controls

a. LUP dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site-shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this Attachment.

b. Run-on and runoff controls are not required for Type 1 LUPs unless the evaluation of quantity and quality of run-on and runoff deems them necessary or visual inspections show that the site requires such controls.

7. Inspection, Maintenance and Repair

a. All inspection, maintenance repair and sampling activities at the discharger's LUP location shall be performed or supervised by a QSP representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.

b. LUP dischargers shall conduct visual inspections and observations daily during working hours (not recorded). At least once each 24-hour period during extended storm events, **LUP Type 2 & 3 dischargers** shall conduct visual inspections to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

c. Upon identifying failures or other shortcomings, as directed by the QSP, LUP dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

d. For each pre- and post-rain event inspection required, LUP dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format that includes the information described below.

e. The LUP discharger shall ensure that the checklist remains on-site or with the SWPPP. At a minimum, an inspection checklist should include:

   i Inspection date and date the inspection report was written.

   ii Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

   iii Site information, including stage of construction, activities completed, and approximate area of the site exposed.

   iv A description of any BMPs evaluated and any deficiencies noted.

   v If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

   vi Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

   vii Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

   viii Photographs taken during the inspection, if any.

   ix Inspector’s name, title, and signature.

K. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS

1. Objectives

SWPPPs for all LUPs shall be developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:

a. All pollutants and their sources, including sources of sediment, associated with construction activities associated with LUP activity are controlled;

b. All non-storm water discharges are identified and either eliminated, controlled, or treated;

c. BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from LUPs during construction; and

d. Stabilization BMPs installed to reduce or eliminate pollutants after construction is completed are effective and maintained.

2. SWPPP Implementation Schedule

a. LUPs for which PRDs have been submitted to the State Water Board shall develop a site/project location SWPPP prior to the start of land-disturbing activity in accordance with this Section and shall implement the SWPPP concurrently with commencement of soil-disturbing activities.

b. For an ongoing LUP involving a change in the LRP, the new LRP shall review the existing SWPPP and amend it, if necessary, or develop a new SWPPP within 15 calendar days to conform to the requirements set forth in this General Permit.

3. Availability

The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

L. REGIONAL WATER BOARD AUTHORITIES

1. Regional Water Boards shall administer the provisions of this General Permit. Administration of this General Permit may include, but is not limited to, requesting the submittal of SWPPPs, reviewing SWPPPs, reviewing monitoring and sampling and analysis reports, conducting compliance inspections, gathering site information by any medium including sampling, photo and video documentation, and taking enforcement actions.

2. Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.

3. Regional Water Boards may issue separate permits for discharges of storm water associated with construction activity to individual dischargers, categories of dischargers, or dischargers in a geographic area. Upon issuance of such permits by a Regional Water Board, dischargers subject to those permits shall no longer be regulated by this General Permit.

4. Regional Water Boards may direct the discharger to reevaluate the LUP Type(s) for the project (or elements/areas of the project) and impose the appropriate level of requirements.

5. Regional Water Boards may terminate coverage under this General Permit for dischargers who negligently or with willful intent incorrectly determine or report their LUP Type (e.g., they determine themselves to be a LUP Type 1 when they are actually a Type 2).

6. Regional Water Boards may review PRDs and reject or accept applications for permit coverage or may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.

7. Regional Water Boards may impose additional requirements on dischargers to satisfy TMDL implementation requirements or to satisfy provisions in their Basin Plans.

8. Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.

9. Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

10. Based on an LUP's threat to water quality and complexity, the Regional Water Board may determine on a case-by-case basis that an LUP, or a portion of an LUP, is not eligible for the linear project requirements contained in this Attachment, and require that the discharger comply with all standard requirements in this General Permit.

11. The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

M. MONITORING AND REPORTING REQUIREMENTS

Table 3. LUP Summary of Monitoring Requirements

LUP Type	Visual Inspections				Sample Collection		
	Daily Site BMP	Pre-storm Event Baseline	Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water	Non-Visible (when applicable)
1	X						x
2	X	X	X	X	X		x
3	X	X	X	X	X	X	x

1. Objectives

LUP dischargers shall prepare a monitoring and reporting program (M&RP) prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The M&RP must be a part of the SWPPP, included as an appendix or separate SWPPP chapter.

2. M&RP Implementation Schedule

a. LUP dischargers shall implement the requirements of this Section at the time of commencement of construction activity. LUP dischargers are responsible for implementing these requirements until construction activity is complete and the site is stabilized.

b. LUP dischargers shall revise the M&RP when:

  i Site conditions or construction activities change such that a change in monitoring is required to comply with the requirements and intent of this General Permit.

  ii The Regional Water Board requires the discharger to revise its M&RP based on its review of the document. Revisions may include, but not be limited to, conducting additional site inspections, submitting reports, and certifications. Revisions shall be submitted via postal mail or electronic e-mail.

iii The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

3. LUP Type 1 Monitoring and Reporting Requirements

a. LUP Type 1 Inspection Requirements

i LUP Type 1 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.

ii LUP Type 1 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.

iii LUP Type 1 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.

iv LUP Type 1 dischargers shall conduct daily visual inspections to verify that:

(1) Appropriate BMPs for storm water and non-storm water are being implemented in areas where active construction is occurring (including staging areas);

(2) Project excavations are closed, with properly protected spoils, and that road surfaces are cleaned of excavated material and construction materials such as chemicals by either removing or storing the material in protective storage containers at the end of every construction day;

(3) Land areas disturbed during construction are returned to pre-construction conditions or an equivalent protection is used at the end of each workday to eliminate or minimize erosion and the possible discharge of sediment or other pollutants during a rain event.

v Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).

vi Inspection programs are required for LUP Type 1 projects where temporary and permanent stabilization BMPs are installed and are to be monitored after active construction is completed. Inspection activities shall continue until adequate permanent stabilization is established and, in areas where re-vegetation is chosen, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.

b. LUP Type 1 Monitoring Requirements for Non-Visible Pollutants

LUP Type 1 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

i Sampling and analysis for non-visible pollutants is only required where the LUP Type 1 discharger believes pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.

(1) Visual observations made during the monitoring program described above will help the LUP Type 1 discharger determine when to collect samples.

(2) The LUP Type 1 discharger is not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.

ii LUP Type 1 dischargers shall collect samples down-gradient from all discharge locations where the visual observations were made triggering the monitoring, and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.

iii If sampling for non-visible pollutant parameters is required, LUP Type 1 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.

iv LUP Type 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

v LUP Type 1 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample[12]) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.

vi LUP Type 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).

vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 1 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification.

viii LUP Type 1 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.

c. <u>LUP Type 1 Visual Observation Exceptions</u>

i LUP Type 1 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. The Type 1 LUP discharger is not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

(1) During dangerous weather conditions such as flooding and electrical storms;

(2) Outside of scheduled site business hours.

(3) When access to the site is unsafe due to storm events.

[12] Sample collected at a location unaffected by contruction activities.

ii If the LUP Type 1 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

d. Particle Size Analysis for Risk Justification

LUP Type 1 dischargers utilizing justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

4. LUP Type 2 & 3 Monitoring and Reporting Requirements

a. LUP Type 2 & 3 Inspection Requirements

i LUP Type 2 & 3 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.

ii LUP Type 2 & 3 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.

iii LUP Type 2 & 3 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.

iv LUP Type 2 & 3 dischargers shall conduct daily visual inspections to verify that appropriate BMPs for storm water and non-storm water are being implemented and in place in areas where active construction is occurring (including staging areas).

v LUP Type 2 & 3 dischargers shall conduct inspections of the construction site prior to anticipated storm events, during extended storm events, and after actual storm events to identify areas contributing to a discharge of storm water associated with construction activity. Pre-storm inspections are to ensure that BMPs are properly installed and maintained; post-storm inspections are to assure that BMPs have functioned adequately. During extended storm events, inspections shall be required during normal working hours for each 24-hour period.

vi Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).

vii LUP Type 2 & 3 dischargers shall implement a monitoring program for inspecting projects that require temporary and permanent stabilization BMPs after active construction is complete. Inspections shall ensure that the BMPs are adequate and maintained. Inspection activities shall continue until adequate permanent stabilization is established and, in vegetated areas, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.

viii If possible, LUP Type 2 & 3 dischargers shall install a rain gauge on-site at an accessible and secure location with readings made during all storm event inspections. When readings are unavailable, data from the closest rain gauge with publically available data may be used.

ix LUP Type 2 & 3 dischargers shall Include and maintain a log of the inspections conducted in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection.

b. LUP Type 2 & 3 Storm Water Effluent Monitoring Requirements

Table 4. LUP Type 2 & 3 Effluent Monitoring Requirements

LUP Type	Frequency	Effluent Monitoring
2	Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction.	Turbidity, pH, and non-visible pollutant parameters (if applicable)
3	Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction.	turbidity, pH, and non-visible pollutant parameters (if applicable)

i LUP Type 2 & 3 dischargers shall collect storm water grab samples from sampling locations characterizing discharges associated with activity from the LUP active areas of construction. At a minimum, 3 samples shall be collected per day of discharge.

ii LUP Type 2 & 3 dischargers shall collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.

iii LUP Type 2 & 3 dischargers shall ensure that storm water grab sample(s) obtained be representative of the flow and characteristics of the discharge.

iv LUP Type 2 & 3 dischargers shall analyze their effluent samples for:

(1) pH and turbidity
(2) Any additional parameter for which monitoring is required by the Regional Water Board.

c. <u>LUP Type 2 & 3 Storm Water Effluent Sampling Locations</u>

i LUP Type 2 & 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire disturbed project or area.

ii LUP Type 2 & 3 dischargers may monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to exceedance of NALs.

iii LUP Type 2 & 3 dischargers shall select analytical test methods from the list provided in Table 5 below.

iv LUP Type 2 & 3 dischargers shall ensure that all storm water sample collection preservation and handling shall be conducted in accordance with the “Storm Water Sample Collection and Handling Instructions” below.

d. <u>LUP Type 3 Receiving Water Monitoring Requirements</u>

i In the event that an LUP Type 3 discharger’s effluent exceeds the receiving water monitoring triggers of 500 NTU turbidity or pH range of 6.0-9.0, contained in this General Permit and has a direct discharge to receiving waters, the LUP discharger shall subsequently sample Receiving Waters (RWs) for turbidity, pH (if applicable) and SSC for the duration of coverage under this General Permit. In the event that an LUP Tupe 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.

ii LUP Type 3 dischargers that meet the project criteria in Appendix 3 of this General Permit and have more than 30 acres of soil disturbance in the project area or project section area designated as Type 3, shall comply with the Bioassessment requirements prior to commencement of construction activity.

iii LUP Type 3 dischargers shall obtain RW samples in accordance with the requirements of the Receiving Water Sampling Locations section (Section M.4.c. of this Attachment).

e. LUP Type 3 Receiving Water Sampling Locations

i **Upstream/up-gradient RW samples**: LUP Type 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible to and upstream from the effluent discharge point.

ii **Downstream/down-gradient RW samples**: LUP Type 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible to and downstream from the effluent discharge point.

iii If two or more discharge locations discharge to the same receiving water, LUP Type 3 dischargers may sample the receiving water at a single upstream and downstream location.

f. LUP Type 2 & 3 Monitoring Requirements for Non-Visible Pollutants

LUP Type 2 & 3 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

i Sampling and analysis for non-visible pollutants is only required where LUP Type 2 & 3 dischargers believe pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.

(1) Visual observations made during the monitoring program described above will help LUP Type 2 & 3 dischargers determine when to collect samples.

(2) LUP Type 2 & 3 dischargers are not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.

ii LUP Type 2 & 3 dischargers shall collect samples down-gradient from the discharge locations where the visual observations were made triggering the monitoring and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.

iii If sampling for non-visible pollutant parameters is required, LUP Type 2 & 3 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.

iv LUP Type 2 & 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

v LUP Type 2 & 3 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample[13]) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.

vi LUP Type 2 & 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).

vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 2 & 3 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed.

[13] Sample collected at a location unaffected by construction activities

Portable meters shall be calibrated according to manufacturer's specification.

viii LUP Type 2 & 3 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.

g. LUP Type 2 & 3 Visual Observation and Sample Collection Exceptions

i LUP Type 2 & 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. Type 2 & 3 LUP dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

(1) During dangerous weather conditions such as flooding and electrical storms;

(2) Outside of scheduled site business hours.

(3) When access to the site is unsafe due to storm events.

ii If the LUP Type 2 or 3 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

h. LUP Type 2 & 3 Storm Water Sample Collection and Handling Instructions

LUP Type 2 & 3 dischargers shall refer to Table 5 below for test Methods, detection Limits, and reporting Units. During storm water sample collection and handling, the LUP Type 2 & 3 discharger shall:

i Identify the parameters required for testing and the number of storm water discharge points that will be sampled. Request the laboratory to provide the appropriate number of sample containers, types of containers, sample container labels, blank chain of custody forms, and sample preservation instructions.

ii Determine how to ship the samples to the laboratory. The testing laboratory should receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory). The options are to either deliver the samples to the laboratory, arrange to have the laboratory pick them up, or ship them overnight to the laboratory.

iii Use only the sample containers provided by the laboratory to collect and store samples. Use of any other type of containers could contaminate your samples.

iv Prevent sample contamination, by not touching, or putting anything into the sample containers before collecting storm water samples.

v Not overfilling sample containers. Overfilling can change the analytical results.

vi Tightly screw the cap of each sample container without stripping the threads of the cap.

vii Complete and attach a label to each sample container. The label shall identify the date and time of sample collection, the person taking the sample, and the sample collection location or discharge point. The label should also identify any sample containers that have been preserved.

viii Carefully pack sample containers into an ice chest or refrigerator to prevent breakage and maintain temperature during shipment. Remember to place frozen ice packs into the shipping container. Samples should be kept as close to 4° C (39° F) as possible until arriving at the laboratory. Do not freeze samples.

ix Complete a Chain of Custody form for each set of samples. The Chain of Custody form shall include the discharger's name, address, and phone number, identification of each sample container and sample collection point, person collecting the samples, the date and time each sample container was filled, and the analysis that is required for each sample container.

x Upon shipping/delivering the sample containers, obtain both the signatures of the persons relinquishing and receiving the sample containers.

xi Designate and train personnel to collect, maintain, and ship samples in accordance with the above sample protocols and good laboratory practices.

xii Refer to the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP) for more information on sampling collection and analysis. See http://www.waterboards.ca.gov/water_issues/programs/swamp/[14]

Table 5. Test Methods, Detection Limits, Reporting Units and Applicable NALs

Parameter	Test Method	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Levels	(LUP Type 3) Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	Type 2 & 3	0.2	pH units	Lower = 6.5 upper = 8.5	Lower = 6.0 upper = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Type 2 & 3	1	NTU	250 NTU	500 NTU
SSC	ASTM Method D 3977-97[15]	Type 3 if Receiving Water Monitoring Trigger is exceeded	5	Mg/L	N/A	N/A
Bioassessment	(STE) Level I of (SAFIT),[16] fixed-count of 600 org/sample	Type 3 LUPs > 30 acres	N/A	N/A	N/A	N/A

i. <u>LUP Type 2 & 3 Monitoring Methods</u>

i The LUP Type 2 or 3 discharger's project M&RP shall include a description of the following items:

(1) Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

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[14] Additional information regarding SWAMP's QAPrP can be found at: http://www.waterboards.ca.gov/water_issues/programs/swamp/.

[15] ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394

[16] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

(2) Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program a copy of the Chain of Custody form used when handling and shipping samples.

(3) Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section M.4.f above.

ii LUP Type 2 & 3 dischargers shall ensure that all sampling and sample preservation be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. All laboratory analyses shall be conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses shall be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). The LUP discharger shall conduct its own field analysis of pH and may conduct its own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

j. <u>LUP Type 2 & 3 Analytical Methods</u>

LUP Type 2 & 3 dischargers shall refer to Table 5 above for test Methods, detection Limits, and reporting Units.

i **pH**: LUP Type 2 & 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or pH test kit. The LUP discharger shall record pH monitoring results on paper and retain these records in accordance with Section M.4.o, below.

ii **Turbidity**: LUP Type 2 & 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results shall be recorded in the site log book in Nephelometric Turbidity Units (NTU).

iii **Suspended sediment concentration (SSC)**: LUP Type 3 dischargers exceeding the turbidity Receiving Water Monitoring Trigger, shall perform SSC analysis using ASTM Method D3977-97.

iv **Bioassessment**: LUP Type 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

k. Watershed Monitoring Option

If an LUP Type 2 or 3 discharger is part of a qualified regional watershed-based monitoring program the LUP Type 2 or 3 discharger may be eligible for relief from the monitoring requirements in this Attachment. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program if it determines that the watershed-based monitoring program will provide information to determine each discharger’s compliance with the requirements of this General Permit.

l. Particle Size Analysis for Risk Justification

LUP Type 2 & 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

m. NAL Exceedance Report

i In the event that any effluent sample exceeds an applicable NAL, the Regional Water Boards may require LUP Type 2 & 3 dischargers to submit NAL Exceedance Reports.

ii LUP Type 2 & 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.

iii LUP Type 2 & 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the exceedance report is filed.

iv LUP Type 2 & 3 dischargers shall include in the NAL Exceedance Report:

(1) the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit"); and
(2) the date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
(3) Description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

n. Monitoring Records

LUP Type 2 & 3 dischargers shall ensure that records of all storm water monitoring information and copies of all reports (including Annual Reports) required by this General Permit be retained for a period of at least three years. LUP Type 2 & 3 dischargers may retain records off-site and make them available upon request. These records shall include:

i The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge);

ii The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements;

iii The date and approximate time of analyses;

iv The individual(s) who performed the analyses;

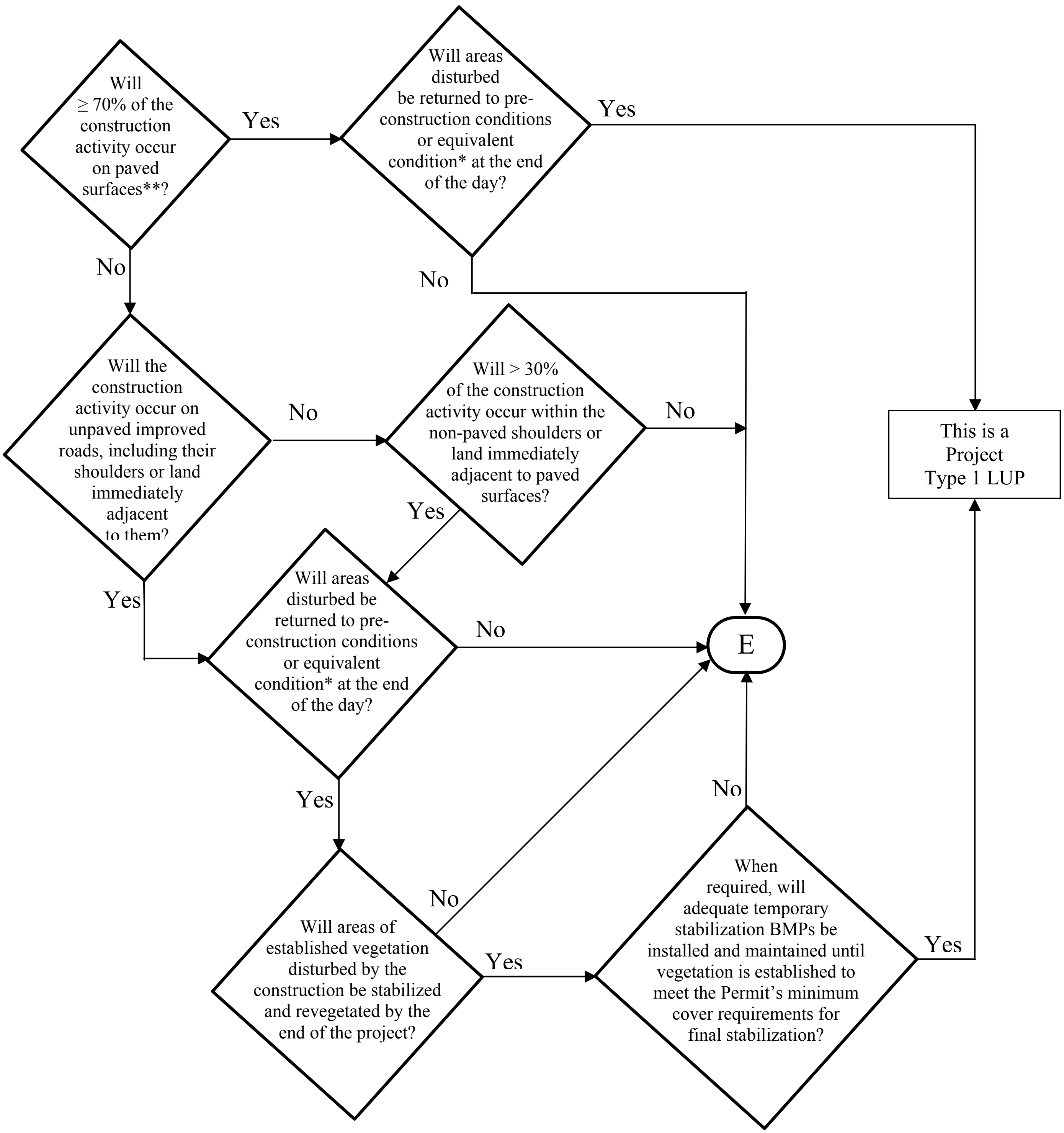
v A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and all chain of custody forms;

vi Quality assurance/quality control records and results;

vii Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Section M.4.a above);

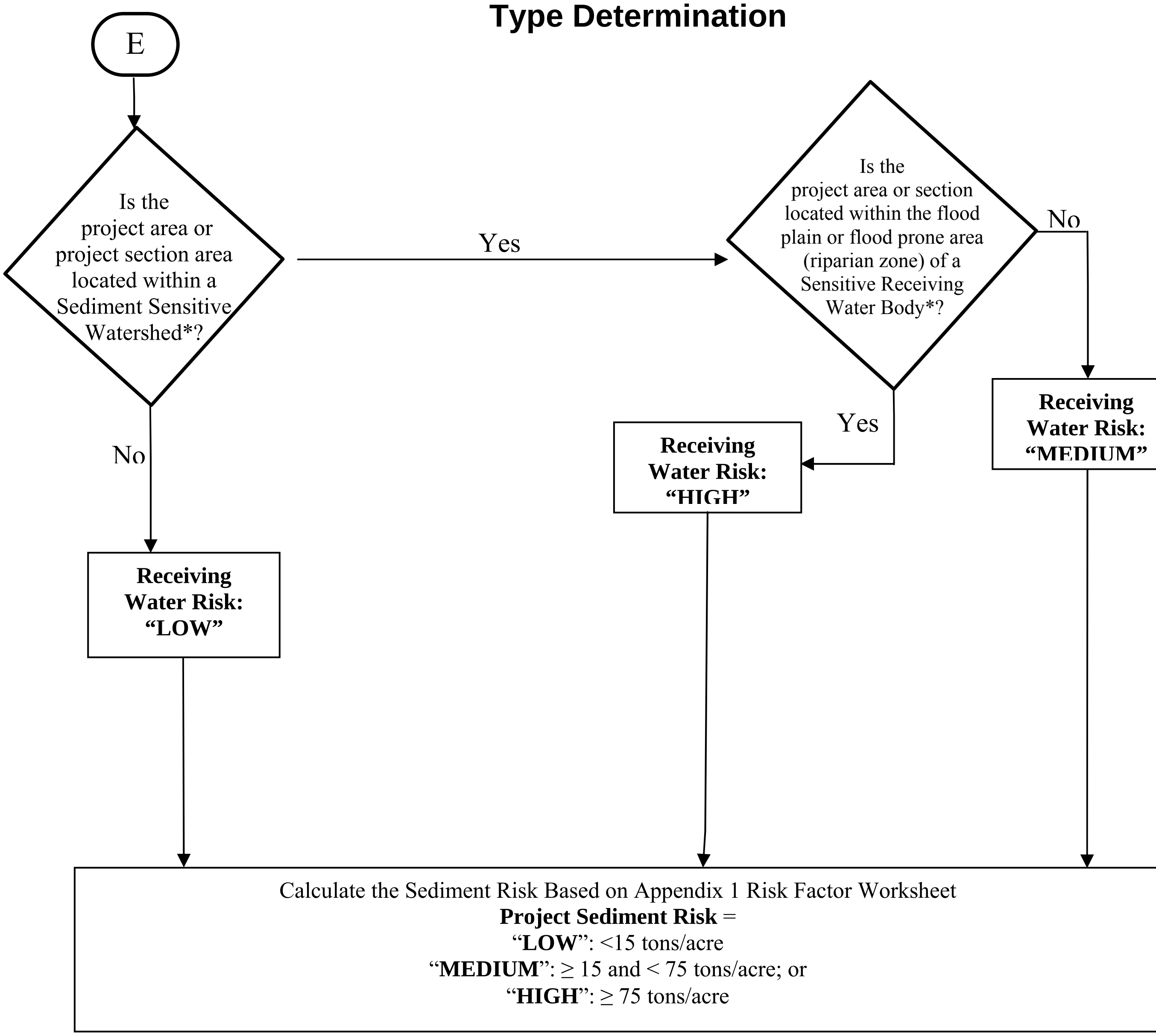
viii Visual observation and sample collection exception records (see Section M.4.g above); and ix The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

ATTACHMENT A.1
LUP Project Area or Project Section Area Type Determination



*See Definition of Terms
** Or: "Will < 30% of the soil disturbance occur on unpaved surfaces?

ATTACHMENT A.1
LUP Project Area or Project Section Area Type Determination



* See Definition of Terms

<u>PROJECT SEDIMENT RISK</u>

<u>RECEIVING WATER RISK</u>		**LOW**	**MEDIUM**	**HIGH**
	LOW	Type 1	Type 1	Type 2
	MEDIUM	Type 1	Type 2	Type 3
	HIGH	Type 2	Type 3	Type 3

ATTACHMENT A.1
Definition of Terms

1. **Equivalent Condition** – Means disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.
2. **Linear Construction Activity** – Linear construction activity consists of underground/ overhead facilities that typically include, but are not limited to, any conveyance, pipe or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/ tower pad and cable/ wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/ borrow locations.
3. **Sediment Sensitive Receiving Water Body –** Defined as a water body segment that is listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or is designated with beneficial uses of SPAWN, MIGRATORY, and COLD.
4. **Sediment Sensitive Watershed –** Defined as a watershed draining into a receiving water body listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or a water body designated with beneficial uses of SPAWN, MIGRATORY, and COLD.

ATTACHMENT A.2
PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS FOR LINEAR UNDERGROUND/OVERHEAD PROJECTS TO COMPLY WITH THE CONSTRUCTION GENERAL PERMIT

GENERAL INSTRUCTIONS

Who Must Submit

This permit is effective on July 1, 2010.

The Legally Responsible Person (LRP) for construction activities associated with linear underground/overhead project (LUP) must electronically apply for coverage under this General Permit on or after July 1, 2010. If it is determined that the LUP construction activities require an NPDES permit, the Legally Responsible Person[1] (LRP) shall submit PRDs for this General Permit in accordance with the following:

LUPs associated with Private or Municipal Development Projects

1. For LUPs associated with pre-development and pre-redevelopment construction activities:

   The LRP must obtain coverage[2] under this General Permit for its pre-development and pre-redevelopment construction activities where the total disturbed land area of these construction activities is greater than 1 acre.

2. For LUPs associated with new development and redevelopment construction projects:

   The LRP must obtain coverage under this General Permit for LUP construction activities associated with new development and redevelopment projects where the total disturbed land area of the LUP is greater than 1 acre. Coverage under this permit is not required where the same LUP construction activities are covered by another NPDES permit.

LUPs not associated with private or municipal new development or redevelopment projects:

The LRP must obtain coverage under this General Permit on or after July 1, 2010 for its LUP construction activities where the total disturbed land area is greater than 1 acre.

PRD Submittal Requirements

Prior to the start of construction activities a LRP must submit PRDs and fees to the State Water Board for each LUP.

New and Ongoing LUPs

Dischargers of new LUPs that commence construction activities after the adoption date of this General Permit shall file PRDs prior to the commencement of construction and implement the SWPPP upon the start of construction.

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[1] person possessing the title of the land on which the construction activities will occur for the regulated site
[2] obtain coverage means filing PRDs for the project.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

Dischargers of ongoing LUPs that are currently covered under State Water Board Order No. 2003-0007 (Small LUP General Permit) shall electronically file Permit Registration Documents no later than July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 2003-0007-DWQ will be terminated. All existing dischargers shall be exempt from the risk determination requirements in Attachment A. All existing dischargers are therefore subject to LUP Type 1 requirements regardless of their project's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the risk determination requirements in Attachment A.

Where to Apply

The Permit Registration Documents (PRDs) can be found at www.waterboards.ca.gov/water_issues/programs/stormwater/

Fees

The annual fee for storm water permits are established through the State of California Code of Regulations.

When Permit Coverage Commences

To obtain coverage under the General Permit, the LRP must include the complete PRDs and the annual fee. All PRDs deemed incomplete will be rejected with an explanation as to what is required to complete submittal. Upon receipt of complete PRDs and associated fee, each discharger will be sent a waste discharger's identification (WDID) number.

Projects and Activities Not Defined As Construction Activity

1. LUP construction activity does not include routine maintenance projects to maintain original line and grade, hydraulic capacity, or original purpose of the facility. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:

    - Maintain the original purpose of the facility, or hydraulic capacity.
    - Update existing lines[3] and facilities to comply with applicable codes, standards and regulations regardless if such projects result in increased capacity.
    - Repairing leaks.

    Routine maintenance does not include construction of new[4] lines or facilities resulting from compliance with applicable codes, standards and regulations.

[3] Update existing lines includes replacing existing lines with new materials or pipes.
[4] New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must acquire new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

2. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).

3. Tie-ins conducted immediately adjacent to “energized” or “pressurized” facilities by the discharger are not considered small construction activities where all other LUP construction activities associated with the tie-in are covered by a NOI and SWPPP of a third party or municipal agency.

Calculating Land Disturbance Areas of LUPs

The total land area disturbed for LUPs is the sum of the:

- Surface areas of trenches, laterals and ancillary facilities, plus
- Area of the base of stockpiles on unpaved surfaces, plus
- Surface area of the borrow area, plus
- Areas of paved surfaces constructed for the project, plus
- Areas of new roads constructed or areas of major reconstruction to existing roads (e.g. improvements to two-track surfaces or road widening) for the sole purpose of accessing construction activities or as part of the final project, plus
- Equipment and material storage, staging, and preparation areas (laydown areas) not on paved surfaces, plus
- Soil areas outside the surface area of trenches, laterals and ancillary facilities that will be graded, and/or disturbed by the use of construction equipment, vehicles and machinery during construction activities.

Stockpiling Areas

Stockpiling areas, borrow areas and the removal of soils from a construction site may or may not be included when calculating the area of disturbed soil for a site depending on the following conditions:

- For stockpiling of soils onsite or immediately adjacent to a LUP site and the stockpile is not on a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation.

- The surface area of borrow areas that are onsite or immediately adjacent to a project site are to be included in the disturbed area calculation.

- For soil that is hauled offsite to a location owned or operated by the discharger that is not a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

- For soil that is brought to the project from an off-site location owned or operated by the discharger the surface area of the borrow pit is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.

- Trench spoils on a paved surface that are either returned to the trench or excavation or hauled away from the project daily for disposal or reuse will not be included in the disturbed area calculation.

If you have any questions concerning submittal of PRDs, please call the State Water Board at (866) 563-3107.

ATTACHMENT B
PERMIT REGISTRATION DOCUMENTS (PRDs) TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL INSTRUCTIONS

A. All Linear Construction Projects shall comply with the PRD requirements in Attachment A.2 of this Order.

B. Who Must Submit

Discharges of storm water associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the General Construction Storm Water Permit (General Permit). Any construction activity that is a part of a larger common plan of development or sale must also be permitted, regardless of size. (For example, if 0.5 acre of a 20-acre subdivision is disturbed by the construction activities of discharger A and the remaining 19.5 acres is to be developed by discharger B, discharger A must obtain a General Storm Water Permit for the 0.5 acre project).

Other discharges from construction activities that are covered under this General Permit can be found in the General Permit Section II.B.

It is the LRP's responsibility to obtain coverage under this General Permit by electronically submitting complete PRDs (Permit Registration Documents).

In all cases, the proper procedures for submitting the PRDs must be completed before construction can commence.

C. Construction Activity Not Covered By This General Permit

Discharges from construction that are not covered under this General Permit can be found in the General Permit Sections II.A &B..

D. Annual Fees and Fee Calculation

Annual fees are calculated based upon the total area of land to be disturbed not the total size of the acreage owned. However, the calculation includes all acres to be disturbed during the duration of the project. For example, if 10 acres are scheduled to be disturbed the first year and 10 in each subsequent year for 5 years, the annual fees would be based upon 50 acres of disturbance. The State Water Board will evaluate adding acreage to an existing Permit Waste Discharge Identification (WDID) number on a case-by-case basis. In general, any acreage to be considered must be contiguous to the permitted land area and the existing

SWPPP must be appropriate for the construction activity and topography of the acreage under consideration. As acreage is built out and stabilized or sold, the Change of Information (COI) form enables the applicant to remove those acres from inclusion in the annual fee calculation. Checks should be made payable to: State Water Board.

The Annual fees are established through regulations adopted by the State Water Board. The total annual fee is the current base fee plus applicable surcharges for all construction sites submitting an NOI, based on the total acreage to be disturbed during the life of the project. Annual fees are subject to change by regulation.

Dischargers that apply for and satisfy the Small Construction Erosivity Wavier requirements shall pay a fee of $200.00 plus an applicable surcharge, see the General Permit Section II.B.7.

E. When to Apply

LRP's proposing to conduct construction activities subject to this General Permit must submit their PRDs prior to the commencement of construction activity.

F. Requirements for Completing Permit Registration Documents (PRDs)

All dischargers required to comply with this General Permit shall electronically submit the required PRDs for their type of construction as defined below.

G. Standard PRD Requirements (All Dischargers)

1. Notice of Intent
2. Risk Assessment (Standard or Site-Specific)
3. Site Map
4. SWPPP
5. Annual Fee
6. Certification

H. Additional PRD Requirements Related to Construction Type

1. Discharger in unincorporated areas of the State (not covered under an adopted Phase I or II SUSMP requirements) and that are not a linear project shall also submit a completed:
    a. Post-Construction Water Balance Calculator (Appendix 2).

2. Dischargers who are proposing to implement ATS shall submit:
    a. Complete ATS Plan in accordance with Attachment F at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation.

b. Certification proof that design done by a professional in accordance with Attachment F.

3. Dischargers who are proposing an alternate Risk Justification:
   a. Particle Size Analysis.

I. Exceptions to Standard PRD Requirements

Construction sites with an R value less than 5 as determined in the Risk Assessment are not required to submit a SWPPP.

J. Description of PRDs

1. Notice of Intent (NOI)

2. Site Map(s) Includes:
   a. The project's surrounding area (vicinity)
   b. Site layout
   c. Construction site boundaries
   d. Drainage areas
   e. Discharge locations
   f. Sampling locations
   g. Areas of soil disturbance (temporary or permanent)
   h. Active areas of soil disturbance (cut or fill)
   i. Locations of all runoff BMPs
   j. Locations of all erosion control BMPs
   k. Locations of all sediment control BMPs
   l. ATS location (if applicable)
   m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
   n. Locations of all post-construction BMPs
   o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices

3. **SWPPPs**
   A site-specific SWPPP shall be developed by each discharger and shall be submitted with the PRDs.

4. **Risk Assessment**
   All dischargers shall use the Risk Assessment procedure as describe in the General Permit Appendix 1.

   a. The Standard Risk Assessment includes utilization of the following:
      i. Receiving water Risk Assessment interactive map

ii. EPA Rainfall Erosivity Factor Calculator Website
iii. Sediment Risk interactive map
iv. Sediment sensitive water bodies list

b. The Site-Specific Risk Assessment includes the completion of the hand calculated R value Risk Calculator

5. **Post-Construction Water Balance Calculator**
All dischargers subject to this requirement shall complete the Water Balance Calculator (in Appendix 2) in accordance with the instructions.

6. **ATS Design Document and Certification**
All dischargers using ATS must submit electronically their system design (as well as any supporting documentation) and proof that the system was designed by a qualified ATS design professional (See Attachment F).

To obtain coverage under the General Permit PRDs must be included and completed. If any of the required items are missing, the PRD submittal is considered incomplete and will be rejected. Upon receipt of a complete PRD submittal, the State Water Board will process the application package in the order received and assign a (WDID) number.

Questions?

If you have any questions on completing the PRDs please email stormwater@waterboards.ca.gov or call (866) 563-3107.

ATTACHMENT C
RISK LEVEL 1 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 1 dischargers shall comply with the narrative effluent standards listed below:

    a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

    b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric – Risk Level 1 dischargers are not subject to a numeric effluent standard.

B. Good Site Management "Housekeeping"

1. Risk Level 1 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 1 dischargers shall implement the following good housekeeping measures:

    a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

    b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 1 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

d. Cover waste disposal containers at the end of every business day and during a rain event.

e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

g. Implement procedures that effectively address hazardous and non-hazardous spills.

h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 1 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 1 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain fertilizers and other landscape materials when they are not actively being used.

   c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 1 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 1 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 1 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

C. Non-Storm Water Management

1. Risk Level 1 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 1 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 1 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 1 dischargers shall implement effective wind erosion control.

2. Risk Level 1 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Risk Level 1 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 1 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 1 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

F. Run-on and Runoff Controls

Risk Level 1 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 1 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.

2. Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended

[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 1 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

   a. Inspection date and date the inspection report was written.

   b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

   c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

   d. A description of any BMPs evaluated and any deficiencies noted.

   e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

   f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

   g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

   h. Photographs taken during the inspection, if any.

   i. Inspector’s name, title, and signature.

H. Rain Event Action Plan
Not required for Risk Level 1 dischargers.

I. Risk Level 1 Monitoring and Reporting Requirements

Table 1- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
1	X	X		X	X		

1. **Construction Site Monitoring Program Requirements**

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Programs to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

   a. To demonstrate that the site is in compliance with the Discharge Prohibitions;

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and

d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 1 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 1 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 1 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 1 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 1 dischargers shall visually observe (inspect):

i. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, the discharger shall implement appropriate corrective actions.

iii. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in e.i and e.iii above, Risk Level 1 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 1 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 1 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 1 – Visual Observation Exemptions**

a. Risk Level 1 dischargers shall be prepared to conduct visual observation (inspections) until the minimum requirements of Section I.3 above are completed. Risk Level 1 dischargers are not required to conduct visual observation (inspections) under the following conditions:

i. During dangerous weather conditions such as flooding and electrical storms.

ii. Outside of scheduled site business hours.

b. If no required visual observations (inspections) are collected due to these exceptions, Risk Level 1 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the visual observations (inspections) were not conducted.

5. **Risk Level 1 – Monitoring Methods**

Risk Level 1 dischargers shall include a description of the visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures in the CSMP.

6. **Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

   i. Risk Level 1 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

   ii. Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

   iii. Risk Level 1 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 1 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

7. **Risk Level 1 – Non-Visible Pollutant Monitoring Requirements**

   a. Risk Level 1 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

   b. Risk Level 1 dischargers shall ensure that water samples are large enough to characterize the site conditions.

   c. Risk Level 1 dischargers shall collect samples at all discharge locations that can be safely accessed.

   d. Risk Level 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

   e. Risk Level 1 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 1 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 1 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[2]

h. Risk Level 1 dischargers shall keep all field /or analytical data in the SWPPP document.

8. **Risk Level 1 – Particle Size Analysis for Project Risk Justification**

Risk Level 1 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

9. **Risk Level 1 – Records**

Risk Level 1 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 1 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

d. The individual(s) who performed the analyses.

[2] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used.

f. Rain gauge readings from site inspections.

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.6 above).

i. Visual observation and sample collection exception records (see Section I.4 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

ATTACHMENT D
RISK LEVEL 2 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. <u>Narrative</u> – Risk Level 2 dischargers shall comply with the narrative effluent standards listed below:

   a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

   b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. <u>Numeric</u> – Risk level 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

B. Good Site Management "Housekeeping"

1. Risk Level 2 dischargers shall implement good site management (i.e., "housekeeping") measures for <u>construction materials</u> that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 2 dischargers shall implement the following good housekeeping measures:

   a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

   b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 2 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

   a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

   b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

   c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

   d. Cover waste disposal containers at the end of every business day and during a rain event.

   e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

   f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

   g. Implement procedures that effectively address hazardous and non-hazardous spills.

   h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require:

      i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly.

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 2 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 2 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain all fertilizers and other landscape materials when they are not actively being used.

   c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 2 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 2 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 2 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

C. Non-Storm Water Management

1. Risk Level 2 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 2 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 2 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 2 dischargers shall implement effective wind erosion control.

2. Risk Level 2 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Risk Level 2 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 2 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 2 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

3. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active[2] construction.

4. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[3] in accordance with Table 1.

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[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

[2] Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage.

[3] Sheet flow length is the length that shallow, low velocity flow travels across a site.

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

5. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.

6. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

F. Run-on and Run-off Controls

Risk Level 2 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 2 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).

2. Risk Level 2 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 2 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 2 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 2 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

   a. Inspection date and date the inspection report was written.

   b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

   c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

   d. A description of any BMPs evaluated and any deficiencies noted.

   e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

   f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

   g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

   h. Photographs taken during the inspection, if any.

   i. Inspector’s name, title, and signature.

H. Rain Event Action Plan

1. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any

likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The discharger shall ensure a QSP obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

2. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).

3. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:

   a. Site Address
   b. Calculated Risk Level (2 or 3)
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number
   d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
   e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number

4. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP include in the REAP, at a minimum, the following project phase information:

   a. Activities associated with each construction phase
   b. Trades active on the construction site during each construction phase
   c. Trade contractor information
   d. Suggested actions for each project phase

5. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:

   a. Site Address
   b. Calculated Risk Level (2 or 3)
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number

d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number
f. Trades active on site during Inactive Construction
g. Trade contractor information
h. Suggested actions for inactive construction sites

6. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.

7. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

I. Risk Level 2 Monitoring and Reporting Requirements

Table 2- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
2	**X**	**X**	**X**	**X**	**X**	**X**	

1. Construction Site Monitoring Program Requirements

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

   a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs).

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.

d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 2 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 2 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 2 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 2 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 2 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 2 dischargers shall visually observe (inspect):

i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.

iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in c.i and c.iii above, Risk Level 2 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 2 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 2 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 2 – Water Quality Sampling and Analysis**

a. Risk Level 2 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.

b. At minimum, Risk Level 2 dischargers shall collect 3 samples per day of the qualifying event.

c. Risk Level 2 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

<u>Storm Water Effluent Monitoring Requirements</u>

d. Risk Level 2 dischargers shall analyze their effluent samples for:

i. pH and turbidity.

ii. Any additional parameters for which monitoring is required by the Regional Water Board.

5. **Risk Level 2 – Storm Water Discharge Water Quality Sampling Locations**

<u>Effluent Sampling Locations</u>

a. Risk Level 2 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.

b. Risk Level 2 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.

c. Risk Level 2 dischargers shall ensure that storm water discharge collected and observed represent[4] the effluent in each drainage area based on visual observation of the water and upstream conditions.

d. Risk Level 2 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

e. Risk Level 2 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.

f. Risk Level 2 dischargers shall select analytical test methods from the list provided in Table 3 below.

g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 “Storm Water Sample Collection and Handling Instructions” below.

6. **Risk Level 2 – Visual Observation and Sample Collection Exemptions**

a. Risk Level 2 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 2 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

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[4] For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment-laden water even if most water flowing through the fence is clear.

i. During dangerous weather conditions such as flooding and electrical storms.

ii. Outside of scheduled site business hours.

b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 2 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.

7. **Risk Level 2 – Storm Water Sample Collection and Handling Instructions**

a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. Risk Level 2 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.

c. Risk Level 2 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).[5]

8. **Risk Level 2 – Monitoring Methods**

a. Risk Level 2 dischargers shall include a description of the following items in the CSMP:

i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program

[5] Additional information regarding SWAMP's QAPrP can be found at http://www.waterboards.ca.gov/water_issues/programs/swamp/.
QAPrP:http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf.

an example Chain of Custody form used when handling and shipping samples.

iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.

b. Risk Level 2 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 2 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services. Risk Level 2 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

9. **Risk Level 2 – Analytical Methods**

a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. **pH**: Risk Level 2 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 2 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.

c. **Turbidity**: Risk Level 2 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).

10. **Risk Level 2 - Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

   i. Risk Level 2 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

   ii. Risk Level 2 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

   iii. Risk Level 2 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 2 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

b. Effluent Sampling Locations:

   i. Risk Level 2 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.

   ii. Risk Level 2 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.

   iii. Risk Level 2 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

11. **Risk Level 2 – Non-Visible Pollutant Monitoring Requirements**

a. Risk Level 2 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

b. Risk Level 2 dischargers shall ensure that water samples are large enough to characterize the site conditions.

c. Risk Level 2 dischargers shall collect samples at all discharge locations that can be safely accessed.

d. Risk Level 2 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

e. Risk Level 2 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 2 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 2 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 2 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[6]

h. Risk Level 2 dischargers shall keep all field /or analytical data in the SWPPP document.

12. **Risk Level 2 – Watershed Monitoring Option**

Risk Level 2 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

[6] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

13. **Risk Level 2 – Particle Size Analysis for Project Risk Justification**

Risk Level 2 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

14. **Risk Level 2 – Records**

Risk Level 2 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 2 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

d. The individual(s) who performed the analyses.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.

f. Rain gauge readings from site inspections;

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).

i. Visual observation and sample collection exception records (see Section I.6 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

15. **Risk Level 2 – NAL Exceedance Report**

a. In the event that any effluent sample exceeds an applicable NAL, Risk Level 2 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.

b. Risk Level 2 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.

c. Risk Level 2 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.

d. Risk Level 2 dischargers shall include in the NAL Exceedance Report:

   i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”).

   ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.

   iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

Table 3 – Risk Level 2 Test Methods, Detection Limits, Reporting Units and Applicable NALs/NELs

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2 Discharges	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2 Discharges other than ATS	1	NTU	250 NTU
		For ATS discharges	1	NTU	N/A

ATTACHMENT E
RISK LEVEL 3 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 3 dischargers shall comply with the narrative effluent standards listed below:

    a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

    b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric –Risk Level 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

B. Good Site Management "Housekeeping"

1. Risk Level 3 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 3 dischargers shall implement the following good housekeeping measures:

    a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

    b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 3 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

   a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

   b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

   c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

   d. Cover waste disposal containers at the end of every business day and during a rain event.

   e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

   f. Contain and securely protecting stockpiled waste material from wind and rain at all times unless actively being used.

   g. Implement procedures that effectively address hazardous and non-hazardous spills.

   h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

      i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 3 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 3 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain fertilizers and other landscape materials when they are not actively being used.

   c. Discontinuing the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 3 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 3 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 3 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

C. Non-Storm Water Management

1. Risk Level 3 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 3 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 3 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 3 dischargers shall implement effective wind erosion control.

2. Risk Level 3 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 3 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 3 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

3. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active[2] construction.

4. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[3] in accordance with Table 1.

[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.
[2] Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage
[3] Sheet flow length is the length that shallow, low velocity flow travels across a site.

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

5. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.

6. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

8. **Additional Risk Level 3 Requirement:** The Regional Water Board may require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

F. Run-on and Run-off Controls

Risk Level 3 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 3 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).

2. Risk Level 3 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 3 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 3 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 3 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

    a. Inspection date and date the inspection report was written.

    b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

    c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

    d. A description of any BMPs evaluated and any deficiencies noted.

    e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

    f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

    g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

    h. Photographs taken during the inspection, if any.

i. Inspector's name, title, and signature.

H. Rain Event Action Plan

1. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The QSP shall obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

2. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).

3. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:

   a. Site Address.
   b. Calculated Risk Level (2 or 3).
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
   d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
   e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.

4. **Additional Risk Level 3 Requirement:** The QSP shall include in the REAP, at a minimum, the following project phase information:

   a. Activities associated with each construction phase.
   b. Trades active on the construction site during each construction phase.
   c. Trade contractor information.
   d. Suggested actions for each project phase.

5. **Additional Risk Level 3 Requirement:** The QSP shall develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:

a. Site Address.
b. Calculated Risk Level (2 or 3).
c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.
f. Trades active on site during Inactive Construction.
g. Trade contractor information.
h. Suggested actions for inactive construction sites.

6. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.

7. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

I. Risk Level 3 Monitoring and Reporting Requirements

Table 2- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
3	X	X	X	X	X	X	X[4]

1. Construction Site Monitoring Program Requirements

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Program in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

[4] When receiving water monitoring trigger is exceeded

a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) of this General Permit.

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.

d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 3 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 3 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 3 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 3 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 3 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 3 dischargers shall visually observe (inspect):

i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.

iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in c.i. and c.iii above, Risk Level 3 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 3 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 3 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 3 – Water Quality Sampling and Analysis**

a. Risk Level 3 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.

b. At minimum, Risk Level 3 dischargers shall collect 3 samples per day of the qualifying event.

c. Risk Level 3 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

<u>Storm Water Effluent Monitoring Requirements</u>

d. Risk Level 3 dischargers shall analyze their effluent samples for:

i. pH and turbidity.

ii. Any additional parameters for which monitoring is required by the Regional Water Board.

e. Risk 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event.

Receiving Water Monitoring Requirements

f. In the event that a Risk Level 3 discharger's effluent exceeds the daily average receiving water monitoring trigger of 500 NTU turbidity or the daily average pH range 6.0-9.0 contained in this General Permit and has a direct discharge into receiving waters, the Risk Level 3 discharger shall subsequently sample receiving waters (RWs) for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit. If a Risk Level 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.

g. Risk Level 3 dischargers disturbing 30 acres or more of the landscape and with direct discharges into receiving waters shall conduct or participate in benthic macroinvertebrate bioassessment of RWs prior to commencement of construction activity (See Appendix 3).

h. Risk Level 3 dischargers shall obtain RW samples in accordance with the Receiving Water sampling location section (Section I.5), below.

5. **Risk Level 3 – Storm Water Discharge Water Quality Sampling Locations**

Effluent Sampling Locations

a. Risk Level 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.

b. Risk Level 3 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.

c. Risk Level 3 dischargers shall ensure that storm water discharge collected and observed represent[5] the effluent in each drainage area based on visual observation of the water and upstream conditions.

d. Risk Level 3 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

e. Risk Level 3 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.

f. Risk Level 3 dischargers shall select analytical test methods from the list provided in Table 3 below.

g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 “Storm Water Sample Collection and Handling Instructions” below.

<u>Receiving Water Sampling Locations</u>

h. **Upstream/up-gradient RW samples**: Risk Level 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible and upstream from the effluent discharge point.

i. **Downstream/down-gradient RW samples**: Risk Level 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible and downstream from the effluent discharge point.

j. If two or more discharge locations discharge to the same receiving water, Risk Level 3 dischargers may sample the receiving water at a single upstream and downstream location.

[5] For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment-laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment laden water even if most water flowing through the fence is clear.

6. **Risk Level 3 – Visual Observation and Sample Collection Exemptions**

   a. Risk Level 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 3 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

      i. During dangerous weather conditions such as flooding and electrical storms.

      ii. Outside of scheduled site business hours.

   b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 3 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.

7. **Risk Level 3 – Storm Water Sample Collection and Handling Instructions**

   a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

   b. Risk Level 3 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.

   c. Risk Level 3 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).[6]

[6] Additional information regarding SWAMP's QAPrP can be found at http://www.waterboards.ca.gov/water_issues/programs/swamp/.
QAPrP:http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf

8. **Risk Level 3 – Monitoring Methods**

   a. Risk Level 3 dischargers shall include a description of the following items in the CSMP:

      i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

      ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program an example Chain of Custody form used when handling and shipping samples.

      iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.

   b. Risk Level 3 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 3 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). Risk Level 3 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

9. **Risk Level 3 – Analytical Methods**

   a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. **pH**: Risk Level 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 3 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.

c. **Turbidity**: Risk Level 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).

d. **Suspended sediment concentration (SSC)**: Risk Level 3 dischargers that exceed the turbidity Receiving Water Monitoring Trigger shall perform SSC analysis using ASTM Method D3977-97.

e. **Bioassessment**: Risk Level 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

10. **Risk Level 3 - Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

i. Risk Level 3 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

ii. Risk Level 3 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

iii. Risk Level 3 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 3 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

b. Effluent Sampling Locations:

   i. Risk Level 3 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.

   ii. Risk Level 3 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.

   iii. Risk Level 3 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

11. **Risk Level 3 – Non-Visible Pollutant Monitoring Requirements**

a. Risk Level 3 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

b. Risk Level 3 dischargers shall ensure that water samples are large enough to characterize the site conditions.

c. Risk Level 3 dischargers shall collect samples at all discharge locations that can be safely accessed.

d. Risk Level 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

e. Risk Level 3 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 3 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 3 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[7]

h. Risk Level 3 dischargers shall keep all field /or analytical data in the SWPPP document.

12. **Risk Level 3 – Watershed Monitoring Option**

Risk Level 3 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

13. **Risk Level 3 – Particle Size Analysis for Project Risk Justification**

Risk Level 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

14. **Risk Level 3 – Records**

Risk Level 3 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 3 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

[7] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

d. The individual(s) who performed the analyses.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.

f. Rain gauge readings from site inspections.

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).

i. Visual observation and sample collection exception records (see Section I.6 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

15. **Risk Level 3 – NAL Exceedance Report**

a. Risk Level 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.

b. Risk Level 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity In this General Permit.

c. Risk Level 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.

d. Risk Level 3 dischargers shall include in the NAL Exceedance Report:

   i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”).

ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.

iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

16. **Risk Level 3 – Bioassessment**

a. Risk Level 3 dischargers with a total project-related ground disturbance exceeding 30 acres shall:

i. Conduct bioassessment monitoring, as described in Appendix 3.

ii. Include the collection and reporting of specified in stream biological data and physical habitat.

iii. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).[8]

b. Risk Level 3 dischargers qualifying for bioassessment, where construction commences out of an index period for the site location shall:

i. Receive Regional Board approval for the sampling exception.

ii. Conduct bioassessment monitoring, as described in Appendix 3.

iii. Include the collection and reporting of specified instream biological data and physical habitat.

iv. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).

OR

v. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.

[8] http://www.waterboards.ca.gov/water_issues/programs/swamp/.

vi. Send a copy of the check to the Regional Water Board office for the site's region.

vii. Invest $**7,500.00 X The number of samples required** into the SWAMP program as compensation (upon regional board approval).

Table 3 – Risk Level 3 Test Methods, Detection Limits, Reporting Units and Applicable NALs

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Level	Numeric Effluent Limitation	Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	Risk Level 3 Discharges	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5	N/A	lower limit = 6.0 upper limit = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 3 Discharges other than ATS	1	NTU	250 NTU	N/A	500 NTU
		For ATS discharges	1	NTU	N/A	10 NTU for Daily Weighted Average & 20 NTU for Any Single Sample	10 NTU for Daily Weighted Average & 20 NTU for Any Single Sample
SSC	ASTM Method D 3977-97[9]	Risk Level 3 (if Receiving Water Monitoring Trigger exceeded)	5	mg/L	N/A	N/A	N/A
Bioassessment	(STE) Level I of (SAFIT),[10] fixed-count of 600 org/sample	Risk Level 3 projects> 30 acres	N/A	N/A	N/A	N/A	N/A

[9] ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394.

[10] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

ATTACHMENT F:
Active Treatment System (ATS) Requirements

Table 1 – Numeric Effluent Limitations, Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level	Numeric Effluent Limitation
Turbidity	EPA 0180.1 and/or field test with a calibrated portable instrument	For ATS discharges	1	NTU	N/A	10 NTU for Daily Flow-Weighted Average & 20 NTU for Any Single Sample

A. Dischargers choosing to implement an Active Treatment System (ATS) on their site shall comply with all of the requirements in this Attachment.

B. The discharger shall maintain a paper copy of each ATS specification onsite in compliance with the record retention requirements in the Special Provisions of this General Permit.

C. ATS Design, Operation and Submittals

1. The ATS shall be designed and approved by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ); a California registered civil engineer; or any other California registered engineer.

2. The discharger shall ensure that the ATS is designed in a manner to preclude the accidental discharge of settled floc[1] during floc pumping or related operations.

3. The discharger shall design outlets to dissipate energy from concentrated flows.

4. The discharger shall install and operate an ATS by assigning a lead person (or project manager) who has either a minimum of five years construction storm

[1] Floc is defined as a clump of solids formed by the chemical action in ATS systems.

water experience or who is a licensed contractors specifically holding a California Class A Contractors license.[2]

5. The discharger shall prepare an ATS Plan that combines the site-specific data and treatment system information required to safely and efficiently operate an ATS. The ATS Plan shall be electronically submitted to the State Water Board at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation. At a minimum, the ATS Plan shall include:

    a. ATS Operation and Maintenance Manual for All Equipment.

    b. ATS Monitoring, Sampling & Reporting Plan, including Quality Assurance/Quality Control (QA/QC).

    c. ATS Health and Safety Plan.

    d. ATS Spill Prevention Plan.

6. The ATS shall be designed to capture and treat (within a 72-hour period) a volume equivalent to the runoff from a 10-year, 24-hour storm event using a watershed runoff coefficient of 1.0.

D. Treatment – Chemical Coagulation/Flocculation

1. Jar tests shall be conducted using water samples selected to represent typical site conditions and in accordance with ASTM D2035-08 (2003).

2. The discharger shall conduct, at minimum, six site-specific jar tests (per polymer with one test serving as a control) for each project to determine the proper polymer and dosage levels for their ATS.

3. Single field jar tests may also be conducted during a project if conditions warrant, for example if construction activities disturb changing types of soils, which consequently cause change in storm water and runoff characteristics.

E. Residual Chemical and Toxicity Requirements

1. The discharger shall utilize a residual chemical test method that has a method detection limit (MDL) of 10% or less than the maximum allowable threshold

[2] Business and Professions Code Division 3, Chapter 9, Article 4, Class A Contractor: A general engineering contractor is a contractor whose principal contracting business is in connection with fixed works requiring specialized engineering knowledge and skill. [http://www.cslb.ca.gov/General-Information/library/licensing-classifications.asp].

concentration[3] (MATC) for the specific coagulant in use and for the most sensitive species of the chemical used.

2. The discharger shall utilize a residual chemical test method that produces a result within one hour of sampling.

3. The discharger shall have a California State certified laboratory validate the selected residual chemical test. Specifically the lab will review the test protocol, test parameters, and the detection limit of the coagulant. The discharger shall electronically submit this documentation as part of the ATS Plan.

4. If the discharger cannot utilize a residual chemical test method that meets the requirements above, the discharger shall operate the ATS in Batch Treatment[4] mode.

5. A discharger planning to operate in Batch Treatment mode shall perform toxicity testing in accordance with the following:

   a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge[5]. All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS) Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.[6]

   b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in “Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012” for Fathead minnow, *Pimephales promelas* (fathead minnow). Acute toxicity for *Oncorhynchus mykiss* (Rainbow Trout) may be used as a substitute for testing fathead minnows.

   c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.

   d. The discharger shall electronically report all acute toxicity testing.

[3] The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. A typical MATC would be:
The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.
[4] Batch Treatment mode is defined as holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full.
[5] This requirement only requires that the test be initiated prior to discharge.
[6] http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf.

F. Filtration

1. The ATS shall include a filtration step between the coagulant treatment train and the effluent discharge. This is commonly provided by sand, bag, or cartridge filters, which are sized to capture suspended material that might pass through the clarifier tanks.

2. Differential pressure measurements shall be taken to monitor filter loading and confirm that the final filter stage is functioning properly.

G. Residuals Management

1. Sediment shall be removed from the storage or treatment cells as necessary to ensure that the cells maintain their required water storage (i.e., volume) capability.

2. Handling and disposal of all solids generated during ATS operations shall be done in accordance with all local, state, and federal laws and regulations.

H. ATS Instrumentation

1. The ATS shall be equipped with instrumentation that automatically measures and records effluent water quality data and flow rate.

2. The minimum data recorded shall be consistent with the Monitoring and Reporting requirements below, and shall include:

   a. Influent Turbidity

   b. Effluent Turbidity

   c. Influent pH

   d. Effluent pH

   e. Residual Chemical

   f. Effluent Flow rate

   g. Effluent Flow volume

3. Systems shall be equipped with a data recording system, such as data loggers or webserver-based systems, which records each measurement on a frequency no longer than once every 15 minutes.

4. Cumulative flow volume shall be recorded daily. The data recording system shall have the capacity to record a minimum of seven days continuous data.

5. Instrumentation systems shall be interfaced with system control to provide auto shutoff or recirculation in the event that effluent measurements exceed turbidity or pH.

6. The system shall also assure that upon system upset, power failure, or other catastrophic event, the ATS will default to a recirculation mode or safe shut down.

7. Instrumentation (flow meters, probes, valves, streaming current detectors, controlling computers, etc.) shall be installed and maintained per manufacturer's recommendations, which shall be included in the QA/QC plan.

8. The QA/QC plan shall also specify calibration procedures and frequencies, instrument method detection limit or sensitivity verification, laboratory duplicate procedures, and other pertinent procedures.

9. The instrumentation system shall include a method for controlling coagulant dose, to prevent potential overdosing. Available technologies include flow/turbidity proportional metering, periodic jar testing and metering pump adjustment, and ionic charge measurement controlling the metering pump.

I. ATS Effluent Discharge

1. ATS effluent shall comply with all provisions and prohibitions in this General Permit, specifically the NELs.

2. NELs for discharges from an ATS:

    a. Turbidity of all ATS discharges shall be less than 10 NTU for daily flow-weighted average of all samples and 20 NTU for any single sample.

    b. Residual Chemical shall be < 10% of MATC[7] for the most sensitive species of the chemical used.

[7] The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

3. If an analytical effluent sampling result exceeds the turbidity NEL (as listed in Table 1), the discharger is in violation of this General Permit and shall electronically file the results in violation within 24-hours of obtaining the results.

4. If ATS effluent is authorized to discharge into a sanitary sewer system, the discharger shall comply with any pre-treatment requirements applicable for that system. The discharger shall include any specific criteria required by the municipality in the ATS Plan.

5. Compliance Storm Event:

   Discharges of storm water from ATS shall comply with applicable NELs (above) unless the storm event causing the discharges is determined after the fact to be equal to or larger than the Compliance Storm Event (expressed in inches of rainfall). The Compliance Storm Event for ATS discharges is the 10 year, 24 hour storm, as determined using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca10y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca10y24.gif

   This exemption is dependent on the submission of rain gauge data verifying the storm event is equal to or larger than the Compliance Storm.

J. Operation and Maintenance Plan

1. Each Project shall have a site-specific Operation and Maintenance (O&M) Manual covering the procedures required to install, operate and maintain the ATS.[8]

2. The O&M Manual shall only be used in conjunction with appropriate project-specific design specifications that describe the system configuration and operating parameters.

3. The O&M Manual shall have operating manuals for specific pumps, generators, control systems,and other equipment.

K. Sampling and Reporting Quality Assurance/ Quality Check (QA/QC) Plan

4. A project-specific QA/QC Plan shall be developed for each project. The QA/QC Plan shall include at a minimum:

   a. Calibration – Calibration methods and frequencies for all system and field instruments shall be specified.

[8] The manual is typically in a modular format covering generalized procedures for each component that is utilized in a particular system.

b. Method Detection Limits (MDLs) – The methods for determining MDLs shall be specified for each residual coagulant measurement method. Acceptable minimum MDLs for each method, specific to individual coagulants, shall be specified.

c. Laboratory Duplicates – Requirements for monthly laboratory duplicates for residual coagulant analysis shall be specified.

L. Personnel Training

1. Operators shall have training specific to using an ATS and liquid coagulants for storm water discharges in California.

2. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal.

3. Training shall include a minimum of eight hours classroom and 32 hours field training. The course shall cover the following topics:

   a. Coagulation Basics –Chemistry and physical processes

   b. ATS System Design and Operating Principles

   c. ATS Control Systems

   d. Coagulant Selection – Jar testing, dose determination, etc.

   e. Aquatic Safety/Toxicity of Coagulants, proper handling and safety

   f. Monitoring, Sampling, and Analysis

   g. Reporting and Recordkeeping

   h. Emergency Response

M. Active Treatment System (ATS) Monitoring Requirements

Any discharger who deploys an ATS on their site shall conduct the following:

1. Visual Monitoring

   a. A designated responsible person shall be on site daily at all times during treatment operations.

b. Daily on-site visual monitoring of the system for proper performance shall be conducted and recorded in the project data log.

   i. The log shall include the name and phone number of the person responsible for system operation and monitoring.

   ii. The log shall include documentation of the responsible person's training.

2. Operational and Compliance Monitoring

   a. Flow shall be continuously monitored and recorded at not greater than 15-minute intervals for total volume treated and discharged.

   b. Influent and effluent pH must be continuously monitored and recorded at not greater than 15-minute intervals.

   c. Influent and effluent turbidity (expressed in NTU) must be continuously monitored and recorded at not greater than 15-minute intervals.

   d. The type and amount of chemical used for pH adjustment, if any, shall be monitored and recorded.

   e. Dose rate of chemical used in the ATS system (expressed in mg/L) shall be monitored and reported 15-minutes after startup and every 8 hours of operation.

   f. Laboratory duplicates – monthly laboratory duplicates for residual coagulant analysis must be performed and records shall be maintained onsite.

   g. Effluent shall be monitored and recorded for residual chemical/additive levels.

   h. If a residual chemical/additive test does not exist and the ATS is operating in a batch treatment mode of operation refer to the toxicity monitoring requirements below.

3. Toxicity Monitoring

   A discharger operating in batch treatment mode shall perform toxicity testing in accordance with the following:

   a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge.[9] All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS)

[9] This requirement only requires that the test be initiated prior to discharge.

Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.[10]

b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012" for Fathead minnow, *Pimephales promelas or* Rainbow trout *Oncorhynchus mykiss* may be used as a substitute for fathead minnow.

c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.[11]

4. Reporting and Recordkeeping

At a minimum, every 30 days a LRP representing the discharger shall access the State Water Boards Storm Water Mulit-Application and Report Tracking system (SMARTS) and electronically upload field data from the ATS. Records must be kept for three years after the project is completed .

5. Non-compliance Reporting

a. Any indications of toxicity or other violations of water quality objectives shall be reported to the appropriate regulatory agency as required by this General Permit.

b. Upon any measurements that exceed water quality standards, the system operator shall immediately notify his supervisor or other responsible parties, who shall notify the Regional Water Board.

c. If any monitoring data exceeds any applicable NEL in this General Permit, the discharger shall electronically submit a NEL Violation Report to the State Water Board within 24 hours after the NEL exceedance has been identified.

i. ATS dischargers shall certify each NEL Violation Report in accordance with the Special Provisions for Construction Activity in this General Permit.

ii. ATS dischargers shall retain an electronic or paper copy of each NEL Violation Report for a minimum of three years after the date the annual report is filed.

iii. ATS dischargers shall include in the NEL Violation Report:

[10] http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf.
[11] http://www.epa.gov/waterscience/methods/wet/.

(1) The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");

(2) The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation; and

(3) A description of the current onsite BMPs, and the proposed corrective actions taken to manage the NEL exceedance.

iv. Compliance Storm Exemption - In the event that an applicable NEL has been exceeded during a storm event equal to or larger than the Compliance Storm Event, ATS dischargers shall report the on-site rain gauge reading and nearby governmental rain gauge readings for verification.

Version 8/17/2011

Risk Determination Worksheet

Step 1	Determine Sediment Risk via one of the options listed:
	1. GIS Map Method - EPA Rainfall Erosivity Calculator & GIS map
	2. Individual Method - EPA Rainfall Erosivity Calculator & Individual Data
Step 2	Determine Receiving Water Risk via one of the options listed:
	1. GIS map of Sediment Sensitive Watersheds provided
	2. Site Specific Analysis (support documentation required)
Step 3	Determine Combined Risk Level

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		0
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		0
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**	0	
16	**Site Sediment Risk Factor**	**Low**	
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			
21			
22			
23	**GIS Map Method:**		
24	**1.** The R factor for the project is calculated using the online calculator at:		
25	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
26			
27	**2**. The K and LS factors may be obtained by accessing the GIS maps located on the State Water Board FTP website at:		
28	ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/		
29			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml **OR** A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml	**no**	**Low**

Region 1 Basin Plan

Region 2 Basin Plan

Region 3 Basin Plan

Region 4 Basin Plan

Region 5 Basin Plan

Region 6 Basin Plan

Region 7 Basin Plan

Region 8 Basin Plan

Region 9 Basin Plan

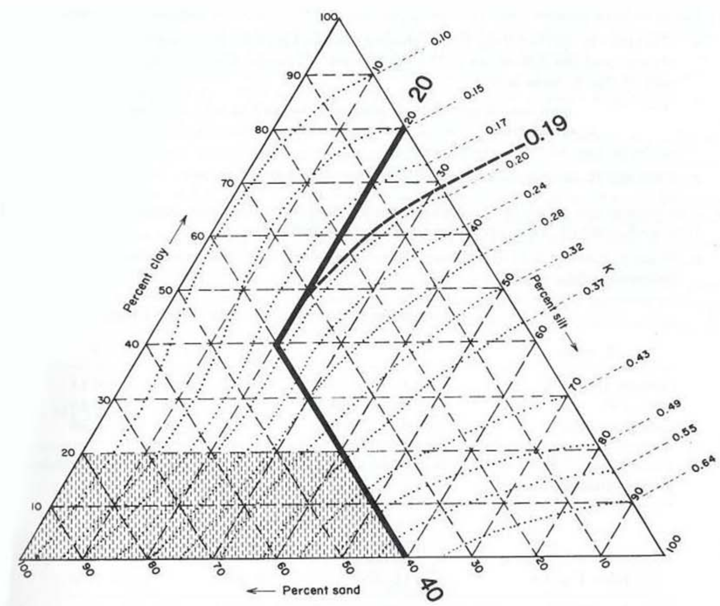
Combined Risk Level Matrix

		Sediment Risk		
		Low	**Medium**	**High**
Receiving Water Risk	**Low**	Level 1	Level 2	Level 2
	High	Level 2	Level 2	Level 3

Project Sediment Risk:	**Low**
Project RW Risk:	**Low**
Project Combined Risk:	**Level 1**

Soil Erodibility Factor (K)

The K factor can be determined by using the nomograph method, which requires that a particle size analysis (ASTM D-422) be done to determine the percentages of sand, very fine sand, silt and clay. Use the figure below to determine appropriate K value.



Erickson triangular nomograph used to estimate soil erodibility (K) factor.
The figure above is the USDA nomograph used to determine the K factor for a soil, based on its texture (% silt plus very fine sand, % sand, % organic matter, soil structure, and permeability). *Nomograph from Erickson 1977 as referenced in Goldman et. al., 1986.*

Sheet Flow Length (ft)	Average Watershed Slope (%)																		
	0.2	**0.5**	**1.0**	**2.0**	**3.0**	**4.0**	**5.0**	**6.0**	**8.0**	**10.0**	**12.0**	**14.0**	**16.0**	**20.0**	**25.0**	**30.0**	**40.0**	**50.0**	**60.0**
<3	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.35	0.36	0.38	0.39	0.41	0.45	0.48	0.53	0.58	0.63
6	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.37	0.41	0.45	0.49	0.56	0.64	0.72	0.85	0.97	1.07
9	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.38	0.45	0.51	0.56	0.67	0.80	0.91	1.13	1.31	1.47
12	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.39	0.47	0.55	0.62	0.76	0.93	1.08	1.37	1.62	1.84
15	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.40	0.49	0.58	0.67	0.84	1.04	1.24	1.59	1.91	2.19
25	0.05	0.07	0.10	0.16	0.21	0.26	0.31	0.36	0.45	0.57	0.71	0.85	0.98	1.24	1.56	1.86	2.41	2.91	3.36
50	0.05	0.08	0.13	0.21	0.30	0.38	0.46	0.54	0.70	0.91	1.15	1.40	1.64	2.10	2.67	3.22	4.24	5.16	5.97
75	0.05	0.08	0.14	0.25	0.36	0.47	0.58	0.69	0.91	1.20	1.54	1.87	2.21	2.86	3.67	4.44	5.89	7.20	8.37
100	0.05	0.09	0.15	0.28	0.41	0.55	0.68	0.82	1.10	1.46	1.88	2.31	2.73	3.57	4.59	5.58	7.44	9.13	10.63
150	0.05	0.09	0.17	0.33	0.50	0.68	0.86	1.05	1.43	1.92	2.51	3.09	3.68	4.85	6.30	7.70	10.35	12.75	14.89
200	0.06	0.10	0.18	0.37	0.57	0.79	1.02	1.25	1.72	2.34	3.07	3.81	4.56	6.04	7.88	9.67	13.07	16.16	18.92
250	0.06	0.10	0.19	0.40	0.64	0.89	1.16	1.43	1.99	2.72	3.60	4.48	5.37	7.16	9.38	11.55	15.67	19.42	22.78
300	0.06	0.10	0.20	0.43	0.69	0.98	1.28	1.60	2.24	3.09	4.09	5.11	6.15	8.23	10.81	13.35	18.17	22.57	26.51
400	0.06	0.11	0.22	0.48	0.80	1.14	1.51	1.90	2.70	3.75	5.01	6.30	7.60	10.24	13.53	16.77	22.95	28.60	33.67
600	0.06	0.12	0.24	0.56	0.96	1.42	1.91	2.43	3.52	4.95	6.67	8.45	10.26	13.94	18.57	23.14	31.89	39.95	47.18
800	0.06	0.12	0.26	0.63	1.10	1.65	2.25	2.89	4.24	6.03	8.17	10.40	12.69	17.35	23.24	29.07	40.29	50.63	59.93
1000	0.06	0.13	0.27	0.69	1.23	1.86	2.55	3.30	4.91	7.02	9.57	12.23	14.96	20.57	27.66	34.71	48.29	60.84	72.15

LS Factors for Construction Sites. *Table from Renard et. al., 1997.*

APPENDIX 2:
Post-Construction Water Balance Performance Standard Spreadsheet

The discharger shall submit with their Notice of Intent (NOI) the following information to demonstrate compliance with the New and Re-Development Water Balance Performance Standard.

Map Instructions

The discharger must submit a small-scale topographic map of the site to show the existing contour elevations, pre- and post-construction drainage divides, and the total length of stream in each watershed area. Recommended scales include 1 in. = 20 ft., 1 in. = 30 ft., 1 in. = 40 ft., or 1 in = 50 ft. The suggested contour interval is usually 1 to 5 feet, depending upon the slope of the terrain. The contour interval may be increased on steep slopes. Other contour intervals and scales may be appropriate given the magnitude of land disturbance.

Spreadsheet Instructions

The intent of the spreadsheet is to help dischargers calculate the project-related increase in runoff volume and select impervious area and runoff reduction credits to reduce the project-related increase in runoff volume to pre-project levels.

The discharger has the option of using the spreadsheet (**Appendix 2.1)** or a more sophisticated, watershed process-based model (e.g. Storm Water Management Model, Hydrological Simulation Program Fortran) to determine the project-related increase in runoff volume.

In* Appendix 4.1**, ***you must complete the worksheet for each land use/soil type combination for each project sub-watershed.

Steps 1 through 9 pertain specifically to the Runoff Volume Calculator:

Step 1: Enter the county where the project is located in cell H3.

Step 2: Enter the soil type in cell H6.

Step 3: Enter the existing pervious (dominant) land use type in cell H7.

Step 4: Enter the proposed pervious (dominant) land use type in cell H8.

Step 5: Enter the total project site area in cell H11 or J11.

Step 6: Enter the sub-watershed area in cell H12 or J12.

Step 7: Enter the existing rooftop area in cell H17 or J17, the existing non-rooftop impervious area in cell H18 or J18, the proposed rooftop area in cell H19 or J19, and the proposed non-rooftop impervious area in cell H20 or J20

Step 8: Work through each of the impervious area reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.

Step 9: Work through each of the impervious volume reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.

Non-structural Practices Available for Crediting

- ***Porous Pavement***
- ***Tree Planting***
- ***Downspout Disconnection***
- ***Impervious Area Disconnection***
- ***Green Roof***
- ***Stream Buffer***
- ***Vegetated Swales***
- ***Rain Barrels and Cisterns***
- ***Landscaping Soil Quality***

Post-Construction Water Balance Calculator

User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you.

(Step 1a) If you know the 85th percentile storm event for your location enter it in the box below

(Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left.
SACRAMENTO

(Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used.
SACRAMENTO FAA ARPT

Project Information			***Runoff Calculations***		
Project Name:	***Optional***		(Step 2) Indicate the Soil Type (dropdown menu to right):	***Group C Soils***	**Low infiltration. Sandy clay loam. Infiltration rate 0.05 to 0.15 inch/hr when wet.**
Waste Discharge Identification (WDID):	***Optional***		(Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right):	***Wood & Grass: <50% ground cover***	
Date:	***Optional***		(Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right):	***Lawn, Grass, or Pasture covering more than 75% of the open space***	
Sub Drainage Area Name (from map):	***Optional***			**Complete Either**	

Runoff Curve Numbers				**Sq Ft**	**Acres**	**Acres**
Existing Pervious Runoff Curve Number	**82**		*(Step 5) Total Project Site Area:*		**5.00**	**5.00**
Proposed Development Pervious Runoff Curve Number	**74**		*(Step 6) Sub-watershed Area:*		**5.00**	**5.00**
Design Storm			*Percent of total project :*	**100%**		

Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area.	**0.62**	**in**				
The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^)	**0.44**	**In**	***(Step 7) Sub-watershed Conditions***	**Complete Either**		**Calculated Acres**
P used for calculations (in) (the greater of the above two criteria)	**0.62**	**In**	Sub-watershed Area (acres)	**Sq Ft**	**Acres**	**5.00**
^Available at www.cabmphandbooks.com			Existing Rooftop Impervious Coverage		**0**	**0.00**
			Existing Non-Rooftop Impervious Coverage		**0**	**0.00**
			Proposed Rooftop Impervious Coverage		**0**	**0.00**
			Proposed Non-Rooftop Impervious Coverage		**0**	**0.00**

			Credits	**Acres**	**Square Feet**
			Porous Pavement	**0.00**	**0**
			Tree Planting	**0.00**	**0**
Pre-Project Runoff Volume (cu ft)	**247**	**Cu.Ft.**	Downspout Disconnection	**0.00**	**0**
Project-Related Runoff Volume Increase w/o credits (cu ft)	**0**	**Cu.Ft.**	Impervious Area Disconnection	**0.00**	**0**
			Green Roof	**0.00**	**0**
			Stream Buffer	**0.00**	**0**
Project-Related Volume Increase with Credits (cu ft)	**0**	**Cu.Ft.**	Vegetated Swales	**0.00**	**0**
			Subtotal	**0.00**	**0**
			Subtotal Runoff Volume Reduction Credit	**0 Cu. Ft.**	

You have achieved your minimum requirements

(Step 9) Impervious Volume Reduction Credits	**Volume (cubic feet)**
Rain Barrels/Cisterns	**0 Cu. Ft.**
Soil Quality	**0 Cu. Ft.**
Subtotal Runoff Volume Reduction	**0 Cu. Ft.**
Total Runoff Volume Reduction Credit	**0 Cu. Ft.**

Porous Pavement Credit Worksheet

Please fill out a porous pavement credit worksheet for each project sub-watershed.

For the PROPOSED Development:

Proposed Porous Pavement	Runoff Reduction*	Fill in either Acres or SqFt: In SqFt.	In Acres	Equivalent Acres
Area of **Brick without Grout** on less than 12 inches of base with at least 20% void space over soil	0.45			0.00
Area of **Brick without Grout** on more than 12 inches of base with at least 20% void space over soil	0.90			0.00
Area of **Cobbles** less than 12 inches deep and over soil	0.30			0.00
Area of **Cobbles** less than 12 inches deep and over soil	0.60			0.00
Area of **Reinforced Grass Pavement** on less than 12 inches of base with at least 20% void space over soil	0.45			0.00
Area of **Reinforced Grass Pavement** on at least 12 inches of base with at least 20% void space over soil	0.90			0.00
Area of **Porous Gravel Pavement** on less than 12 inches of base with at least 20% void space over soil	0.38			0.00
Area of **Porous Gravel Pavement** on at least 12 inches of base with at least 20% void space over soil	0.75			0.00
Area of **Poured Porous Concrete or Asphalt Pavement** with less than 4 inches of gravel base (washed stone)	0.40			0.00
Area of **Poured Porous Concrete or Asphalt Pavement** with 4 to 8 inches of gravel base (washed stone)	0.60			0.00
Area of **Poured Porous Concrete or Asphalt Pavement** with 8 to 12 inches of gravel base (washed stone)	0.80			0.00
Area of **Poured Porous Concrete or Asphalt Pavement** with 12 or more inches of gravel base (washed stone)	1.00			0.00

*=1-Rv**

Return to Calculator

**Using Site Design Techniques to meet Development Standards for Stormwater Quality (BASMAA 2003)

**NCDENR Stormwater BMP Manual (2007)

Tree Planting Credit Worksheet
Please fill out a tree canopy credit worksheet for each project sub-watershed.

Tree Canopy Credit Criteria	Number of Trees Planted	Credit (acres)
Number of proposed evergreen trees to be planted (credit = number of trees x 0.005)*	0	0.00
Number of proposed deciduous trees to be planted (credit = number of trees x 0.0025)*		0.00
	Square feet Under Canopy	
Square feet under an existing tree canopy, that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is LESS than 12 in diameter.		0.00
Square feet under an existing tree canopy that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is 12 in diameter or GREATER.		0.00
Please describe below how the project will ensure that these trees will be maintained.		

0

Return to Calculator

* credit amount based on credits from Stormwater Quality Design Manual for the Sacramento and South Placer Regions

Downspout Disconnection Credit Worksheet

Please fill out a downspout disconnection credit worksheet for each project subwatershed. If you answer yes to all questions, all rooftop area draining to each downspout will be subtracted from your proposed rooftop impervious coverage.

Downspout Disconnection Credit Criteria					
Do downspouts and any extensions extend at least six feet from a basement and two feet from a crawl space or concrete slab?				○ Yes	◉ No
Is the area of rooftop connecting to each disconnected downspout 600 square feet or less?				○ Yes	◉ No
Is the roof runoff from the design storm event fully contained in a raised bed or planter box or does it drain as sheet flow to a landscaped area large enough to contain the roof runoff from the design storm event?				○ Yes	◉ No
The Stream Buffer and/or Vegetated Swale credits **will not** be taken in this sub-watershed area?				○ Yes	◉ No
Percentage of existing	0.00	Acres	of rooftop surface has disconnected downspouts		
Percentage of the proposed	0.00	Acres	of rooftop surface has disconnected downspouts	50	
				Return to Calculator	

Impervious Area Disconnection Credit Worksheet

Please fill out an impervious area disconnection credit worksheet for each project sub-watershed. If you answer yes to all questions, all non-rooftop impervious surface area will be subtracted from your proposed non-rooftop impervious coverage.

Non-Rooftop Disconnection Credit Criteria	Response
Is the maximum contributing impervious flow path length less than 75 feet or, if equal or greater than 75 feet, is a storage device (e.g. French drain, bioretention area, gravel trench) implemented to achieve the required disconnection length?	◉ Yes ○ No
Is the impervious area to any one discharge location less than 5,000 square feet?	◉ Yes ○ No
The Stream Buffer credit **will not** be taken in this sub-watershed area?	◉ Yes ○ No

Percentage of existing	0.00	Acres	non-rooftop surface area disconnected	
Percentage of the proposed	0.00	Acres	non-rooftop surface area disconnected	70

Return to Calculator

Green Roof Credit Worksheet

Please fill out a greenroof credit worksheet for each project sub-watershed. If you answer yes to all questions, 70% of the greenroof area will be subtracted from your proposed rooftop impervious coverage.

Green Roof Credit Criteria	Response
Is the roof slope less than 15% or does it have a grid to hold the substrate in place until it forms a thick vegetation mat?	◉ Yes ○ No
Has a professional engineer assessed the necessary load reserves and designed a roof structure to meet state and local codes?	◉ Yes ○ No
Is the irrigation needed for plant establishment and/or to sustain the green roof during extended dry periods, is the source from stored, recycled, reclaimed, or reused water?	◉ Yes ○ No
Percentage of existing 0.00 Acres rooftop surface area in greenroof	
Percentage of the proposed 0.00 Acres rooftop surface area in greenroof	

Return to Calculator

Stream Buffer Credit Worksheet

Please fill out a stream buffer credit worksheet for each project sub-watershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout and/or Impervious Area Disconnection credits.

Stream Buffer Credit Criteria				Response
Does runoff enter the floodprone width* or within 500 feet (whichever is larger) of a stream channel as sheet flow**?				○ Yes ◉ No
Is the contributing overland slope 5% or less, or if greater than 5%, is a level spreader used?				○ Yes ◉ No
Is the buffer area protected from vehicle or other traffic barriers to reduce compaction?				○ Yes ◉ No
Will the stream buffer be maintained in an ungraded and uncompacted condition and will the vegetation be maintained in a natural condition?				○ Yes ◉ No
Percentage of existing	0.00	Acres	impervious surface area draining into a stream buffer:	
Percentage of the proposed	0.00	Acres	impervious surface area that will drain into a stream buffer:	
Please describe below how the project will ensure that the buffer areas will remain in ungraded and uncompacted condition and that the vegetation will be maintained in a natural condition.				

Return to Calculator

* floodprone width is the width at twice the bankfull depth.
** the maximum contributing length shall be 75 feet for impervious area

Vegetated Swale Credit Worksheet

Please fill out a vegetated swale worksheet for each project subwatershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout Disconnection credit.

Vegetated Swale Credit Criteria

Have all vegetated swales been designed in accordance with Treatment Control BMP 30 (TC-30 - Vegetated Swale) from the California Stormwater BMP Handbook, New Development and Redevelopment (available at www.cabmphandbooks.com)?	○ Yes ◉ No
Is the maximum flow velocity for runoff from the design storm event less than or equal to 1.0 foot per second?	○ Yes ◉ No

Percentage of existing	0.00	Acres of impervious area draining to a vegetated swale	
Percentage of the proposed	0.00	Acres of impervious area draining to a vegetated swale	

Return to Calculator

Rain Barrel/Cistern Credit Worksheet

Please fill out a rain barrel/cistern worksheet for each project sub-watershed.

Rain Barrel/Cistern Credit Criteria	Response
Total number of rain barrel(s)/cisterns	
Average capacity of rain barrel(s)/cistern(s) (in gallons)	
Total capacity rain barrel(s)/cistern(s) (in cu ft) [1]	0

[1] accounts for 10% loss

Return to Calculator

Please fill out a soil quality worksheet for each project sub-watershed.

	Response
Will the landscaped area be lined with an impervious membrane?	
Will the soils used for landscaping meet the ideal bulk densities listed in Table 1 below?[1]	○ Yes ◉ No
If you answered yes to the question above, and you know the area-weighted bulk density within the top 12 inches for soils used for landscaping (in g/cm^3)* , fill in the cell to the right and skip to cell G11. If not select from the drop-down menu in G10.	1.3
If you answered yes to the question above, but you do not know the exact bulk density, which of the soil types in the drop down menu to the right best describes the top 12 inches for soils used for landscaping (in g/cm^3).	Sandy loams, loams
What is the average depth of your landscaped soil media meeting the above criteria (inches)?	12
What is the total area of the landscaped areas meeting the above criteria (in acres)?	2.97

Return to Calculator

Table 1

Sands, loamy sands	<1.6
Sandy loams, loams	<1.4
Sandy clay loams, loams, clay loams	<1.4
Silts, silt loams	<1.3
Silt loams, silty clay loams	<1.1
Sandy clays, silty clays, some clay loams (35-45% clay)	<1.1
Clays (>45% clay)	<1.1

[1] USDA NRCS. "Soil Quality Urban Technical Note No.2-Urban Soil Compaction". March 2000.
http://soils.usda.gov/sqi/management/files/sq_utn_2.pdf

* To determine how to calculate density see:
http://www.globe.gov/tctg/bulkden.pdf?sectionID=94

Porosity (%) 50.94%

Mineral grains in many soils are mainly quartz and feldspar, so 2.65 a good average for particle density. To determine percent porosity, use the formula: Porosity (%) = (1-Bulk Density/2.65) X 100

APPENDIX 3
Bioassessment Monitoring Guidelines

Bioassessment monitoring is required for projects that meet all of the following criteria:

1. The project is rated Risk Level 3 or LUP Type 3
2. The project directly discharges runoff to a freshwater wadeable stream (or streams) that is either: (a) listed by the State Water Board or USEPA as impaired due to sediment, and/or (b) tributary to any downstream water body that is listed for sediment; and/or have the beneficial use SPAWN & COLD & MIGRATORY
3. Total project-related ground disturbance exceeds 30 acres.

For all such projects, the discharger shall conduct bioassessment monitoring, as described in this section, to assess the effect of the project on the biological integrity of receiving waters.
Bioassessment shall include:

1. The collection and reporting of specified instream biological data
2. The collection and reporting of specified instream physical habitat data

<u>Bioassessment Exception</u>
If a site qualifies for bioassessment, but construction commences out of an index period for the site location, the discharger shall:

1. Receive Regional Water Board approval for the sampling exception
2. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.
3. Send a copy of the check to the Regional Water Board office for the site's region
4. Invest **7,500.00 X The number of samples required** into the SWAMP program as compensation (upon Regional Water Board approval).
5. Conduct bioassessment monitoring, as described in Appendix 4
6. Include the collection and reporting of specified instream biological data and physical habitat
7. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP)

<u>Site Locations and Frequency</u>
Macroinvertebrate samples shall be collected both before ground disturbance is initiated and after the project is completed. The "after" sample(s) shall be collected after at least one winter season resulting in surface runoff has transpired after project-related ground disturbance has ceased. "Before" and "after" samples shall be collected both upstream and downstream of the project's

discharge. Upstream samples should be taken immediately before the sites outfall and downstream samples should be taken immediately after the outfall (when safe to collect the samples). Samples should be collected for each freshwater wadeable stream that is listed as impaired due to sediment, or tributary to a water body that is listed for sediment. Habitat assessment data shall be collected concurrently with all required macroinvertebrate samples.

Index Period (Timing of Sample Collection)
Macroinvertebrate sampling shall be conducted during the time of year (i.e., the "index period") most appropriate for bioassessment sampling, depending on ecoregion. This map is posted on the State Water Board's Website: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml

Field Methods for Macroinvertebrate Collections
In collecting macroinvertebrate samples, the discharger shall use the "Reachwide Benthos (Multi-habitat) Procedure" specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007).[1]

Physical - Habitat Assessment Methods
The discharger shall conduct, concurrently with all required macroinvertebrate collections, the "Full" suite of physical habitat characterization measurements as specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007), and as summarized in the Surface Water Ambient Monitoring Program's *Stream Habitat Characterization Form — Full Version*.

Laboratory Methods
Macroinvertebrates shall be identified and classified according to the Standard Taxonomic Effort (STE) Level I of the Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT),[2] and using a fixed-count of 600 organisms per sample.

Quality Assurance
The discharger or its consultant(s) shall have and follow a quality assurance (QA) plan that covers the required bioassessment monitoring. The QA plan shall include, or be supplemented to include, a specific requirement for external QA checks (i.e., verification of taxonomic identifications and correction of data where

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[1] This document is available on the Internet at: ~~http://www.swrcb.ca.gov/swamp/docs/phab_sopr6.pdf~~. http://swamp.mpsl.mlml.calstate.edu/wp-content/uploads/2009/04/swamp_sop_bioassessment_collection_020107.pdf.
[2] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: ~~http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf~~ http://www.safit.org/Docs/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

errors are identified). External QA checks shall be performed on one of the discharger's macroinvertebrate samples collected per calendar year, or ten percent of the samples per year (whichever is greater). QA samples shall be randomly selected. The external QA checks shall be paid for by the discharger, and performed by the California Department of Fish and Game's Aquatic Bioassessment Laboratory. An alternate laboratory with equivalent or better expertise and performance may be used if approved in writing by State Water Board staff.

Sample Preservation and Archiving
The original sample material shall be stored in 70 percent ethanol and retained by the discharger until: 1) all QA analyses specified herein and in the relevant QA plan are completed; and 2) any data corrections and/or re-analyses recommended by the external QA laboratory have been implemented. The remaining subsampled material shall be stored in 70 percent ethanol and retained until completeness checks have been performed according to the relevant QA plan. The identified organisms shall be stored in 70 percent ethanol, in separate glass vials for each final ID taxon. (For example, a sample with 45 identified taxa would be archived in a minimum of 45 vials, each containing all individuals of the identified taxon.) Each of the vials containing identified organisms shall be labeled with taxonomic information (i.e., taxon name, organism count) and collection information (i.e., site name/site code, waterbody name, date collected, method of collection). The identified organisms shall be archived (i.e., retained) by the discharger for a period of not less than three years from the date that all QA steps are completed, and shall be checked at least once per year and "topped off" with ethanol to prevent desiccation. The identified organisms shall be relinquished to the State Water Board upon request by any State Water Board staff.

Data Submittal
The macroinvertebrate results (i.e., taxonomic identifications consistent with the specified SAFIT STEs, and number of organisms within each taxa) shall be submitted to the State Water Board in electronic format. The State Water Board's Surface Water Ambient Monitoring Program (SWAMP) is currently developing standardized formats for reporting bioassessment data. All bioassessment data collected after those formats become available shall be submitted using the SWAMP formats. Until those formats are available, the biological data shall be submitted in MS-Excel (or equivalent) format.[3]

The physical/habitat data shall be reported using the standard format titled *SWAMP Stream Habitat Characterization Form — Full Version*.[4]

[3] Any version of Excel, 2000 or later, may be used.
[4] Available at:
http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Invasive Species Prevention

In conducting the required bioassessment monitoring, the discharger and its consultants shall take precautions to prevent the introduction or spread of aquatic invasive species. At minimum, the discharger and its consultants shall follow the recommendations of the California Department of Fish and Game to minimize the introduction or spread of the New Zealand mudsnail.[5]

[5] Instructions for controlling the spread of NZ mudsnails, including decontamination methods, can be found at: http://www.dfg.ca.gov/invasives/mudsnail/
More information on AIS More information on AIS
http://www.waterboards.ca.gov/water_issues/programs/swamp/ais/

Appendix 4 Non Sediment TMDLs

Region 1 Lost River-DIN and CBOD

Region 1 Source: Cal Trans Construction TMDL Completion Date: 12 30 2008 TMDL Type: River, Lake Watershed Area= 2996 mi^2	**Pollutant Stressors/WLA**	
	Dissolved inorganic nitrogen (DIN) (metric tons/yr)	**Carbonaceous biochemical oxygen demand (CBOD) (metric tons/yr)**
Lost River from the Oregon border to Tule Lake	.1	.2
Tule Lake Refuge	.1	.2
Lower Klamath Refuge	.1	.2

Region 2 San Francisco Bay-Mercury

Region 2 Source:Non-Urban Stormwater Runoff TMDL Type: Bay	**Name**	**Pollutant Stressor/WLA**	**TMDL Completion Date**
	San Francisco Bay	Mercury 25 kg/year	08 09 2006

Region 4 Ballona Creek-Metals and Selenium

Region 4 Source: NPDES General Construction TMDL Completion Date: 12 22 2005 TMDL Type: Creek	**Pollutant Stressors/WLA**							
	Copper (Cu)		**Lead (Pb)**		**Selenium (Se)**		**Zinc (Zn)**	
	g/day	g/day/acre	g/day	g/day/acre	g/day	g/day/acre	g/day	g/day/acre
Ballona Creek	4.94E-07 x Daily storm volume (L)	2.20E-10 x Daily storm volume (L)	1.62E-06 x Daily storm volume (L)	7.20E-10 x Daily storm volume (L)	1.37E-07 x Daily storm volume (L)	6.10E-11 x Daily storm volume (L)	3.27E-06 x Daily storm volume (L)	1.45E-09 x Daily storm volume (L)

General Construction Storm Water Permits:
Waste load allocations will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.

- Dry-weather Implementation Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (Water Quality Order No. 99-08 DWQ), or any successor order, are exempt from the dry-weather waste load allocation equal to zero as long as they comply with the provisions of sections C.3 and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be:
  (1) infeasible to eliminate
  (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and
  (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order.
  Unauthorized non-storm water flows are already prohibited by Order No. 99-08 DWQ.
- Wet-weather Implementation Within seven years of the effective date of the TMDL, the construction industry will submit the results of BMP effectiveness studies to determine BMPs that will achieve compliance with the final waste load allocations assigned to construction storm water permittees.
- Regional Board staff will bring the recommended BMPs before the Regional Board for consideration within eight years of the effective date of the TMDL.
- General construction storm water permittees will be considered in compliance with final waste load allocations if they implement these Regional Board approved BMPs. All permittees must implement the approved BMPs within nine years of the effective date of the TMDL. If no effectiveness studies are conducted and no BMPs are approved by the Regional Board within eight years of the effective date of the TMDL, each general construction storm water permit holder will be subject to site-specific BMPs and monitoring requirements to demonstrate compliance with final waste load allocations.

Region 4 Calleaguas Creek-OC Pesticides, PCBs, and Siltation

Interim Requirements

Region 4 Calleaguas Creek Source: Minor NPDES point sources/WDRs TMDL Completion Date: 3 14 2006 TMDL Type:Creek	**Pollutant Stressor**	**WLA Daily Max (µg/L)**	**WLA Monthly Ave (µg/L)**
	Chlordane	1.2	0.59
	4,4-DDD	1.7	0.84
	4,4-DDE	1.2	0.59
	4,4-DDT	1.2	0.59
	Dieldrin	0.28	0.14
	PCB’s	0.34	0.17
	Toxaphene	0.33	0.16

Final WLA (ng/g)							
Region 4 Calleaguas Creek Source: Stormwater Permittees TMDL Completion Date: 3 14 2006 TMDL Type:Creek	Chlordane	4,4-DDD	4,4-DDE	4,4-DDT	Dieldrin	PCB's	Toxaphene
Mugu Lagoon*	3.3	2.0	2.2	0.3	4.3	180.0	360.0
Callegaus Creek	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Revolon Slough (SW)*	0.9	2.0	1.4	0.3	0.1	130.0	1.0
Arroyo Las posas(SW)*	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Arroyo Simi	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Conejo Creek	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Interim Requirements (ng/g)							
Mugu Lagoon*	25.0	69.0	300.0	39.0	19.0	180.	22900.0
Callegaus Creek	17.0	66.0	470.0	110.0	3.0	3800.0	260.0
Revolon Slough (SW)*	48.0	400.0	1600.0	690.0	5.7	7600.0	790.0
Arroyo Las posas(SW)*	3.3	290.0	950.0	670.0	1.1	25700.0	230.0
Arroyo Simi	3.3	14.0	170.0	25.0	1.1	25700.0	230.0
Conejo Creek	3.4	5.3	20.0	2.0	3.0	3800.0	260.0

*(SW)=Subwatershed
*Mugu Lagoon includes Duck pond/Agricultural Drain/Mugu/Oxnard Drain #2
Compliance with sediment based WLAs is measured as an instream annual average at the base of each subwatershed where the discharges are located.

Region 4 Calleguas Creek-Salts

Final Dry Weather Pollutant WLA (mg/L)					
Region 4 Calleaguas Creek Source Permitted Stormwater Dischargers TMDL Completion Date: 12 2 2008 TMDL Type:Creek	**Critical Condition Flow Rate (mgd)**	**Chloride (lb/day)**	**TDS (lb/day)**	**Sulfate (lb/day)**	**Boron (lb/day)**
Simi	1.39	1738.0	9849.0	2897.0	12.0
Las Posas	0.13	157.0	887.0	261.0	N/A
Conejo	1.26	1576.0	8931.0	2627.0	N/A

Camarillo	0.06	72.0	406.0	119.0	N/A
Pleasant Valley (Calleguas)	0.12	150.0	850.0	250.0	N/A
Pleasant Valley (Revolon)	0.25	314.0	1778.0	523.0	2.0

Dry Weather Interim Pollutant WLA (mg/L)				
	Chloride (mg/L)	**TDS (mg/L)**	**Sulfate (mg/L)**	**Boron (mg/L)**
Simi	230.0	1720.0	1289.0	1.3
Las Posas	230.0	1720.0	1289.0	1.3
Conejo	230.0	1720.0	1289.0	1.3
Camarillo	230.0	1720.0	1289.0	1.3
Pleasant Valley (Calleguas)	230.0	1720.0	1289.0	1.3
Pleasant Valley (Revolon)	230.0	1720.0	1289.0	1.3

- General Construction permittees are assigned a dry weather wasteload allocation equal to the average dry weather critical condition flow rate multiplied by the numeric target for each constituent. Waste load allocations apply in the receiving water at the base of each subwatershed. Dry weather allocations apply when instream flow rates are below the 86th percentile flow and there has been no measurable precipitation in the previous 24 hours.
- Because wet weather flows transport a large mass of salts at low concentrations, these dischargers meet water quality objectives during wet weather.
- Interim limits are assigned for dry weather discharges from areas covered by NPDES stormwater permits to allow time to implement appropriate actions. The interim limits are assigned as concentration based receiving water limits set to the 95th percentile of the discharger data as a monthly average limit except for chloride. The 95th percentile for chloride was 267 mg/L which is higher than the recommended criteria set forth in the Basin Plan for protection of sensitive beneficial uses including aquatic life. Therefore, the interim limit for chloride for Permitted Stormwater Dischargers is set equal to 230 mg/L to ensure protection of sensitive beneficial uses in the Calleguas Creek watershed.

Region 4 San Gabriel River and Tributaries-Metals and Selenium

Region 4 San Gabriel River and Tributaries Source: Construction Stormwater Dischargers TMDL Completion Date: 3 2007 TMDL Type: Creek	**Pollutant Stressor**	**Wet weather Allocations**	**Dry Weather Allocations**	**% of Watershed**

San Gabriel Reach 2	Lead (Pb)	0.7% * 166 µg/l * Daily Storm Vol	N/A	0.7%
San Gabriel Reach 2	Lead (Pb) Mass based	0.8 kg/d	N/A	0.7%
Coyote Creek	Copper (Cu)	0.285 kg/d	0	5.0%
Coyote Creek	Lead (Pb)	1.70 kg/d	N/A	5.0%
Coyote Creek	Zinc (Zn)	2.4 kg/d	N/A	5.0%
San Jose Creek Reach 1 and 2	Selenium	5 µg/L	5 µg/L	5.0%

Wet-weather allocations for lead in San Gabriel River Reach 2. Concentration-based allocations apply to non-stormwater NPDES discharges. Stormwater allocations are expressed as a percent of load duration curve. Mass-based values presented in table are based on a flow of 260 cfs (daily storm volume = 6.4 $x10^8$ liters).

There are 1555 acres of water in the entire watershed, 37.4 acres of water in the Reach 1 subwatershed (2.4%), and 269 acres in the Coyote Creek subwatershed (17%).

General Construction Storm Water Permits

Waste load allocations for the general construction storm water permits may be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board. An estimate of direct atmospheric deposition is developed based on the percent area of surface water in the watershed. Approximately 0.4% of the watershed area draining to San Gabriel River Reach 2 is comprised of water and approximately 0.2% of the watershed area draining to Coyote Creek is comprised of water.

Region 4 The Harbor Beaches of Ventura County-Bacteria

The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine water to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters. Bacteriological objectives are set forth in Chapter 3 of the Basin Plan. The objectives are based on four bacteria indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are:

The General NPDES Construction permit is seen as a minor contributor and is given no allocation

General NPDES permits, individual NPDES permits, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR permittees in the Channel Islands Harbor subwatershed are assigned WLAs of zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, individual NPDES permit, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR will also be subject to a WLA of zero (0) days of allowable exceedances.

Region 4 Resolution No. 03-009 Los Angeles River and Tributaries-Nutrients

Minor Point Sources
Waste loads are allocated to minor point sources enrolled under NPDES or WDR permits including but not limited to Tapia WRP, Whittier Narrows WRP, Los Angeles Zoo WRP, industrial and construction stormwater, and municipal storm water and urban runoff from municipal separate storm sewer systems (MS4s)

Region 4 Minor Point Sources for NPDES/WDR Permits TMDL Completion Date: 7 10 2003	Pollutant Stressor/WLA				
	Total Ammonia (NH_3)		**Nitrate-nitrogen (NO_3-N)**	**Nitrite-nitrogen (NO_2-N)**	**NO_3-N + NO_3-N**
TMDL Type: River	1 Hr Ave mg/l	30 Day Ave mg/l	30 Day Ave mg/l		30 Day Ave mg/l
LA River Above Los Angeles-Glendale WRP (LAG)	4.7	1.6	8.0	1.0	8.0
LA River Below LAG	8.7	2.4	8.0	1.0	8.0
Los Angeles Tributaries	10.1	2.3	8.0	1.0	8.0

Malibu Creek Attachment A to Resolution No. 2004-019R-Bacteria

12 13 2004 The WLAs for permittees under the NPDES General Stormwater Construction Permit are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean.

Region 4 Marina del Rey Harbor, Mothers' Beach and Back Basins

Attachment A to Resolution No. 2003-012-Bacteria

8 7 2003 As discussed in "Source Analysis", discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, general industrial storm water permit or general construction storm water permit within the MdR Watershed will also be subject to a WLA of zero days of allowable exceedances.

Region 4 San Gabriel River and Tributaries-Metals and Selenium

Dry Weather Selenium WLA
A zero WLA is assigned to the industrial and construction stormwater permits during dry weather. Non-storm water discharges are already prohibited or restricted by existing general permits.

Region 4 General Construction Permittees TMDL Completion Date: 7 13 2006 TMDL Type: River	**Total Recoverable Metals (kg/day)**		
	Copper (Cu) Kg/day	**Lead (Pb) Kg/day**	**Zinc (Zn) Kg/day**
San Gabriel River Reach 2 and upstream reaches/tributaries	**XXXX**	Daily storm volume x 1.24 µg/L	**XXXX**
Coyote Creek and Tributaries	Daily storm volume x 0.7 µg/L	Daily storm volume x 4.3 µg/L	Daily storm volume x 6.2 µg/L

Each enrollee under the general construction stormwater permit receives a WLA on a per acre basis

Region 4 General Construction Permittees TMDL Completion Date: 7 13 2006 TMDL Type: River	**Total Recoverable Metals (kg/day/acre)**		
	Copper (Cu) Kg/acre/day	**Lead (Pb) Kg/acre/day**	**Zinc (Zn) Kg/acre/day**
San Gabriel River Reach 2 and upstream reaches/tributaries	**XXXX**	Daily storm volume x 0.56 µg/L	**XXXX**

Coyote Creek and Tributaries	Daily storm volume x 0.12 µg/L	Daily storm volume x 0.70 µg/L	Daily storm volume x 1.01 µg/L

For the general industrial and construction storm water permits, the daily storm volume is measured at USGS station 11085000 for discharges to Reach 2 and above and at LACDPW flow gauge station F354-R for discharges to Coyote Creek.

General construction storm water permits
WLAs will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.

Dry-weather implementation
Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (NPDES Permit No. CAS000002), or any successor permit, are exempt from the dry-weather WLA equal to zero as long as they comply with the provisions of sections C.3.and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be (1) infeasible to eliminate (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order. Unauthorized non-storm water flows are already prohibited by Permit No. CAS000002.

Upon permit issuance, renewal, or re-opener
Non-storm water flows not authorized by Order No. 99-08 DWQ, or any successor order, shall achieve dry-weather WLAs. WLAs shall be expressed as NPDES water quality-based effluent limitations specified in accordance with federal regulations and state policy on water quality control. Effluent limitations may be expressed as permit conditions, such as the installation, maintenance, and monitoring of Regional Board-approved BMPs.

Six years from the effective date of the TMDL
The construction industry will submit the results of wet-weather BMP effectiveness studies to the Los Angeles Regional Board for consideration. In the event that no effectiveness studies are conducted and no BMPs are approved, permittees shall be subject to site-specific BMPs and monitoring to demonstrate BMP effectiveness.

Seven years from the effective date of the TMDL
The Los Angeles Regional Board will consider results of the wet weather BMP effectiveness studies and consider approval of BMPs.

Eight years from the effective date of the TMDL
All general construction storm water permittees shall implement Regional Board-approved BMPs.

Total Maximum Daily Loads (TMDLs) for San Diego Creek,
Upper and Lower Newport Bay, Orange County, California

Region 8 NPDES Construction Permit TMDL Completion Date: 1 24 1995	Organochlorine Compounds							
	Total DDT		**Chlordane**		**Total PCBs**		**Toxaphene**	
TMDL Type: River. Cr, Bay	g/day	g/yr	g/day	g/yr	g/day	g/yr	g/day	g/yr
San Diego Creek	.27	99.8	**.18***	**64.3***	**.09***	**31.5***	.004	1.5
Upper Newport Bay	.11	40.3	.06	23.4	.06	23.2	**X**	**X**
Lower Newport Bay	.04	14.9	.02	8.6	.17	60.7	**X**	**X**

*Red= Informational WLA only, not for enforcement purposes

Organochlorine Compounds TMDLs Implementation Tasks and Schedule

Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board's expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. The SWPPP Improvement Program shall be completed by (*the date of OAL approval of this BPA*). ***No later than two months*** from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements as soon as possible but ***no later than (three months of completion of the SWPPP Improvement Program)***. Applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly. The Caltrans and Orange County MS4 permits shall be revised as needed to assure that the permittees communicate the Regional Board's SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval.

Appendix 4 Sediment TMDLs

Implemented Sediment TMDLs in California. Construction was listed as a source in all fo these TMDLs in relation to road construction. Although construction was mentioned as a source, it was not given a specific allocation amount. The closest allocation amount would be for the road activity management WLA. **Implementation Phase** – Adoption process by the Regional Board, the State Water Resources Control Board, the Office of Administrative Law, and the US Environmental Protection Agency completed and TMDL being implemented.

A. Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.albionfinaltmdl	R	Albion River	Sedimentation	Road Construction	2001	43 acres	See A (table 6)

B Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.EelR-middle.mainSed.temp	R	Middle Main Eel River and Tributaries (from Dos Rios to the South Fork)	Sedimentation	Road Construction	2005-2006	521 mi^2	100

C Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.EelRsouth.sed.temp	R	South Fork Eel River	Sedimentation	Road Construction	12 1999	See chart	473

D Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.bigfinaltmdl	R	Big River	Sedimentation	Road Construction	12 2001	181 mi^2 watershed drainage	TMDL = loading capacity = nonpoint sources + background =

							393 t mi2 yr

E Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.EelR-lower.Sed.temp-121807-signed	R	Lower Eel River	Sedimentation	Road Construction	12 2007	300 square-mile watershed	898

F Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.EelR-middle.Sed.temp-	R	Middle Fork Eel River	Sedimentation	Road Construction	12 2003	753 mi^2 (approx. 482,000 acres)	82

G Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres** Mi^2	**WLA** tons mi^2 yr
1 R1.epa.EelRnorth-Sed.temp.final-121807-signed	R	North Fork Eel River	Sedimentation	Road Construction	12 30 2002	289 (180,020 acres)	20

H Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres** Mi^2	**WLA** tons mi^2 yr
1 R1.epa.EelR-upper.mainSed.temp-	R	Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury)	Sedimentation	Road Construction	12 29 2004	688 (approx. 440,384 acres)	14

I Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.gualalafinaltmdl	R	Gualala River	Sedimentation	Road Construction	Not sure	300 (191,145 acres)	7

J Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.Mad-sed.turbidity	R	Mad River	Sedimentation	Road Construction	12 21 2007	480	174

K Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.mattole.sediment	R	Mattole River	Sedimentation	Road Construction	12 30 2003	296	27 or 520+27 = 547

L Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.navarro.sed.temp	R	Navarro River	Sedimentation	Road Construction	Not sure	315 (201,600 acres).	50

M Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.noyo.sediment	R	Noyo River	Sedimentation	Road Construction	12 16 1999	113 (72,323 acres)	68 (three areas measured) Table 16 in the TMDL

N Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.RedwoodCk.sed	Cr	Redwood Creek	Sedimentation	Road Construction	12 30 1998	278	1900 Total allocation

O Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA – Roads tons mi^2 yr
1 R1.epa.tenmile.sed	R	Ten Mile River	Sedimentation	Road Construction	2000	120	9

P Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA management tons mi^2 yr
1 R1.epa.trinity.sed	R	Trinity River	Sedimentation	Road Construction	12 20 2001	2000 of 3000 covered in this TMDL	See rows below
1	Cr	Horse Linto Creek	Sedimentation	Road Construction	12 20 2001	64	528
1	Cr	Mill creek and Tish Tang	Sedimentation	Road Construction	12 20 2001	39	210
1	Cr	Willow Creek	Sedimentation	Road Construction	12 20 2001	43	94
1	Cr	Campbell Creek and Supply Creek	Sedimentation	Road Construction	12 20 2001	11	1961
1	Cr	Lower Mainstem and Coon Creek	Sedimentation	Road Construction	12 20 2001	32	63
1	R	Reference	Sedimentation	Road	12 20 2001	434	24

		Subwatershed [1]		Construction			
1	Cr	Canyon Creek	Sedimentation	Road Construction	12 20 2001	64	326
1	R	Upper Tributaries[2]	Sedimentation	Road Construction	12 20 2001	72	67
1	R	Middle Tributaries[3]	Sedimentation	Road Construction	12 20 2001	54	53
1	R	Lower Tributaries[4]	Sedimentation	Road Construction	12 20 2001	96	55
1	Cr	Weaver and Rush Creeks	Sedimentation	Road Construction	12 20 2001	72	169
1	Cr	Deadwood Creek Hoadley Gulch Poker Bar	Sedimentation	Road Construction	12 20 2001	47	68
1	L	Lewiston Lake	Sedimentation	Road Construction	12 20 2001	25	49
1	Cr	Grassvalley Creek	Sedimentation	Road Construction	12 20 2001	37	44
1	Cr	Indian Creek	Sedimentation	Road Construction	12 20 2001	34	81
1	Cr	Reading and Browns Creek	Sedimentation	Road Construction	12 20 2001	104	66
1	Cr	Reference Subwatersheds[5]	Sedimentation	Road Construction	12 20 2001	235	281
1	L, Cr	Westside tributaries[6]	Sedimentation	Road Construction	12 20 2001	93	105
1	R, Cr, G	Upper trinity[7]	Sedimentation	Road Construction	12 20 2001	161	690
1	R, Cr, G	East Fork Tributaries[8]	Sedimentation	Road Construction	12 20 2001	115	65

1
2
3
4
5
6
7
8

1	R, L	Eastside Tributaries[9]	Sedimentation	Road Construction	12 20 2001	89	60

1 New River, Big French, Manzanita, North Fork, East Fork, North Fork
2 Dutch, Soldier, Oregon gulch, Conner Creek
3 Big Bar, Prairie Creek, Little French Creek
4 Swede, Italian, Canadian, Cedar Flat, Mill, McDonald, Hennessy, Quimby, Hawkins, Sharber
5 Stuarts Fork, Swift Creek, Coffee Creek
6 Stuart Arm, Stoney Creek, Mule Creek, East Fork, Stuart Fork, West Side Trinity Lake, Hatchet Creek, Buckeye Creek,
7 Upper Trinity River, Tangle Blue, Sunflower, Graves, Bear Upper Trinity Mainstream, Ramshorn Creek, Ripple Creek, Minnehaha Creek, Snowslide Gulch, Scorpion Creek
8 East Fork Trinity, Cedar Creek, Squirrel Gulch
9 East Side Tributaries, Trinity Lake

Q Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres** mi^2	**WLA** tons mi^2 yr
1 R1.epa.trinity.so.sed	R, Cr	South Fork Trinity River and Hayfork Creek	Sedimentation	Road Construction	12 1998	Not given, 19 miles long	33 (road total)

R Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres** mi^2	**WLA** tons mi^2 yr
1 R1.epa.vanduzen.sed	R, Cr	Van Duzen River and Yager Creek	Sedimentation	Various	12 16 1999	429	1353 total allocation
1		Upper Basin	Sedimentation	Road Construction			7
1		Middle Basin	Sedimentation	Road Construction			22
1		Lower Basin	Sedimentation	Road Construction			20

S Region	**Type**	**Name**	**Pollutant Stressor**	**Potential**	**TMDL**	**Watershed**	**WLA** tons mi^2

9

				Sources	**Completion Date**	**Acres** mi^2	yr
6 R6.blackwood.sed	Cr	Blackwood Creek (Placer County)	Bedded Sediment	Various	9 2007	11	17272 total

T Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres** mi^2	**WLA** tons mi^2 yr
6 R6.SquawCk.sed	R	Squaw Creek (Placer County)	Sedimentation /controllable sources	Various – basin plan amendment	4 13 2006	8.2	10,900

Adopted TMDLs for Construction Sediment Sources

Region	Type	Name	Pollutant Stressor	Potential Sources	**TMDL Completion Date**	**Watershed Area** mi^2	Waste load Allocation tons mi^2 yr
8	R	Newport Bay San Diego Creek Watershed	Sedimentation	Construction Land Development	1999	2.24 (1432 acres)	125,000 tons per Year (no more than 13,000 tons per year from construction sites)

APPENDIX 5:
Glossary

Active Areas of Construction
All areas subject to land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active areas until final stabilization is complete. [The construction activity Phases used in this General Permit are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase.]

Active Treatment System (ATS)
A treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment.

Acute Toxicity Test
A chemical stimulus severe enough to rapidly induce a negative effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute.

Air Deposition
Airborne particulates from construction activities.

Approved Signatory
A person who has been authorized by the Legally Responsible Person to sign, certify, and electronically submit Permit Registration Documents, Notices of Termination, and any other documents, reports, or information required by the General Permit, the State or Regional Water Board, or U.S. EPA. The Approved Signatory must be one of the following:

1. For a corporation or limited liability company: a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation or limited liability company; or (b) the manager of the facility if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

2. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

3. For a municipality, State, Federal, or other public agency: a principal executive officer, ranking elected official, city manager, council president, or any other authorized public employee with managerial responsibility over the

construction or land disturbance project (including, but not limited to, project manager, project superintendent, or resident engineer);

4. For the military: any military officer or Department of Defense civilian, acting in an equivalent capacity to a military officer, who has been designated;

5. For a public university: an authorized university official;

6. For an individual: the individual, because the individual acts as both the Legally Responsible Person and the Approved Signatory; or

7. For any type of entity not listed above (e.g. trusts, estates, receivers): an authorized person with managerial authority over the construction or land disturbance project.

Beneficial Uses
As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Best Available Technology Economically Achievable (BAT)
As defined by USEPA, BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT)
As defined by USEPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

Best Professional Judgment (BPJ)
The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

Best Management Practices (BMPs)
BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures,

and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Chain of Custody (COC)
Form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

Coagulation
The clumping of particles in a discharge to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

Common Plan of Development
Generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning documents, such as land use master plans, conceptual master plans, or broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

Daily Average Discharge
The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day (40 CFR 122.2). In the case of pH, the pH must first be converted from a log scale.

Debris
Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

Direct Discharge
A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.

Discharger
The Legally Responsible Person (see definition) or entity subject to this General Permit.

Dose Rate (for ATS)
In exposure assessment, dose (e.g. of a chemical) per time unit (e.g. mg/day), sometimes also called dosage.

Drainage Area
The area of land that drains water, sediment, pollutants, and dissolved materials to a common outlet.

Effluent
Any discharge of water by a discharger either to the receiving water or beyond the property boundary controlled by the discharger.

Effluent Limitation
Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

Erosion
The process, by which soil particles are detached and transported by the actions of wind, water, or gravity.

Erosion Control BMPs
Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

Field Measurements
Testing procedures performed in the field with portable field-testing kits or meters.

Final Stabilization
All soil disturbing activities at each individual parcel within the site have been completed in a manner consistent with the requirements in this General Permit.

First Order Stream
Stream with no tributaries.

Flocculants
Substances that interact with suspended particles and bind them together to form flocs.

Good Housekeeping BMPs
BMPs designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Grading Phase (part of the Grading and Land Development Phase)
Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

Hydromodification
Hydromodification is the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation.

Identified Organisms
Organisms within a sub-sample that is specifically identified and counted.

Inactive Areas of Construction
Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Index Period
The period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers. Instream communities naturally vary over the course of a year,and sampling during the index period ensures that samples are collected during a time frame when communities are stable so that year-to-year consistency is obtained. The index period approach provides a cost-effective alternative to year-round sampling. Furthermore, sampling within the appropriate index period will yield results that are comparable to the assessment thresholds or criteria for a given region, which are established for the same index period. Because index periods differ for different parts of the state, it is essential to know the index period for your area.

K Factor
The soil erodibility factor used in the Revised Universal Soil Loss Equation (RUSLE). It represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil.

Legally Responsible Person
The Legally Responsible Person (LRP) will typically be the project proponent. The categories of persons or entities that are eligible to serve as the LRP are set forth below. For any construction or land disturbance project where multiple persons or entities are eligible to serve as the LRP, those persons or entities

shall select a single LRP. In exceptional circumstances, a person or entity that qualifies as the LRP may provide written authorization to another person or entity to serve as the LRP. In such a circumstance, the person or entity that provides the authorization retains all responsibility for compliance with the General Permit. Except as provided in category 2(d), a contractor who does not satisfy the requirements of any of the categories below is not qualified to be an LRP.

The following persons or entities may serve as an LRP:

1. A person, company, agency, or other entity that possesses a real property interest (including, but not limited to, fee simple ownership, easement, leasehold, or other rights of way) in the land upon which the construction or land disturbance activities will occur for the regulated site.

2. In addition to the above, the following persons or entities may also serve as an LRP:

   a. For linear underground/overhead projects, the utility company, municipality, or other public or private company or agency that owns or operates the LUP;

   b. For land controlled by an estate or similar entity, the person who has day-to-day control over the land (including, but not limited to, a bankruptcy trustee, receiver, or conservator);

   c. For pollution investigation and remediation projects, any potentially responsible party that has received permission to conduct the project from the holder of a real property interest in the land; or

   d. For U.S. Army Corp of Engineers projects, the U.S. Army Corps of Engineers may provide written authorization to its bonded contractor to serve as the LRP, provided, however, that the U.S. Army Corps of Engineers is also responsible for compliance with the general permit, as authorized by the Clean Water Act or the Federal Facilities Compliance Act.

Likely Precipitation Event
Any weather pattern that is forecasted to have a 50% or greater chance of producing precipitation in the project area. The discharger shall obtain likely precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

Maximum Allowable Threshold Concentration (MATC)
The allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity

testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

Natural Channel Evolution
The physical trend in channel adjustments following a disturbance that causes the river to have more energy and degrade or aggrade more sediment. Channels have been observed to pass through 5 to 9 evolution types. Once they pass though the suite of evolution stages, they will rest in a new state of equilibrium.

Non-Storm Water Discharges
Discharges are discharges that do not originate from precipitation events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

Non-Visible Pollutants
Pollutants associated with a specific site or activity that can have a negative impact on water quality, but cannot be seen though observation (ex: chlorine). Such pollutants being discharged are not authorized.

Numeric Action Level (NAL)
Level is used as a warning to evaluate if best management practices are effective and take necessary corrective actions. Not an effluent limit.

Original Sample Material
The material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification.

pH
Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

Post-Construction BMPs
Structural and non-structural controls which detain, retain, or filter the release of pollutants to receiving waters after final stabilization is attained.

Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)
Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

Project

Qualified SWPPP Developer
Individual who is authorized to develop and revise SWPPPs.

Qualified SWPPP Practitioner
Individual assigned responsibility for non-storm water and storm water visual observations, sampling and analysis, and responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

Qualifying Rain Event
Any event that produces 0.5 inches or more precipitation with a 48 hour or greater period between rain events.

R Factor
Erosivity factor used in the Revised Universal Soil Loss Equation (RUSLE). The R factor represents the erosivity of the climate at a particular location. An average annual value of R is determined from historical weather records using erosivity values determined for individual storms. The erosivity of an individual storm is computed as the product of the storm's total energy, which is closely related to storm amount, and the storm's maximum 30-minute intensity.

Rain Event Action Plan (REAP)
Written document, specific for each rain event, that when implemented is designed to protect all exposed portions of the site within 48 hours of any likely precipitation event.

Remaining Sub sampled Material
The material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but the sample needs to be checked and verified using a complete Quality Assurance (QA) plan)

Routine Maintenance
Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Runoff Control BMPs
Measures used to divert runon from offsite and runoff within the site.

Run-on
Discharges that originate offsite and flow onto the property of a separate project site.

Revised Universal Soil Loss Equation (RUSLE)
Empirical model that calculates average annual soil loss as a function of rainfall and runoff erosivity, soil erodibility, topography, erosion controls, and sediment controls.

Sampling and Analysis Plan
Document that describes how the samples will be collected, under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

Sediment
Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation
Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

Sediment Control BMPs
Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

Settleable Solids (SS)
Solid material that can be settled within a water column during a specified time frame. It is typically tested by placing a water sample into an Imhoff settling cone and then allowing the solids to settle by gravity for a given length of time. Results are reported either as a volume (mL/L) or a mass (mg/L) concentration.

Sheet Flow
Flow of water that occurs overland in areas where there are no defined channels where the water spreads out over a large area at a uniform depth.

Site

Soil Amendment
Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water.

Streets and Utilities Phase
Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

Structural Controls
Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution

Suspended Sediment Concentration (SSC)
The measure of the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

Total Suspended Solids (TSS)
The measure of the suspended solids in a water sample includes inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

Toxicity
The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Turbidity
The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

Vertical Construction Phase
The Build out of structures from foundations to roofing, including rough landscaping.

Waters of the United States
Generally refers to surface waters, as defined by the federal Environmental Protection Agency in 40 C.F.R. § 122.2.[1]

Water Quality Objectives (WQO)
Water quality objectives are defined in the California Water Code as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

[1] The application of the definition of "waters of the United States" may be difficult to determine; there are currently several judicial decisions that create some confusion. If a landowner is unsure whether the discharge must be covered by this General Permit, the landowner may wish to seek legal advice.

APPENDIX 6:
Acronym List

ASBS	Areas of Special Biological Significance
ASTM	American Society of Testing and Materials; Standard Test Method for Particle-Size Analysis of Soils
ATS	Active Treatment System
BASMAA	Bay Area Storm water Management Agencies Association
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BPJ	Best Professional Judgment
CAFO	Confined Animal Feeding Operation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	NPDES General Permit for Storm Water Discharges Associated with Construction Activities
CIWQS	California Integrated Water Quality System
CKD	Cement Kiln Dust
COC	Chain of Custody
CPESC	Certified Professional in Erosion and Sediment Control
CPSWQ	Certified Professional in Storm Water Quality
CSMP	Construction Site Monitoring Program
CTB	Cement Treated Base
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code
CWP	Center for Watershed Protection
DADMAC	Diallyldimethyl-ammonium chloride
DDNR	Delaware Department of Natural Resources
DFG	Department of Fish and Game
DHS	Department of Health Services
DWQ	Division of Water Quality
EC	Electrical Conductivity
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ESA	Environmentally Sensitive Area
ESC	Erosion and Sediment Control
HSPF	Hydrologic Simulation Program Fortran
JTU	Jackson Turbidity Units
LID	Low Impact Development
LOEC	Lowest Observed Effect Concentration
LRP	Legally Responsible Person
LUP	Linear Underground/Overhead Projects

MATC	Maximum Allowable Threshold Concentration
MDL	Method Detection Limits
MRR	Monitoring and Reporting Requirements
MS4	Municipal Separate Storm Sewer System
MUSLE	Modified Universal Soil Loss Equation
NAL	Numeric Action Level
NEL	Numeric Effluent Limitation
NICET	National Institute for Certification in Engineering Technologies
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observed Effect Concentration
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTR	National Toxics Rule
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance
PAC	Polyaluminum chloride
PAM	Polyacrylamide
PASS	Polyaluminum chloride Silica/sulfate
POC	Pollutants of Concern
PoP	Probability of Precipitation
POTW	Publicly Owned Treatment Works
PRDs	Permit Registration Documents
PWS	Planning Watershed
QAMP	Quality Assurance Management Plan
QA/QC	Quality Assurance/Quality Control
REAP	Rain Event Action Plan
Regional Board	Regional Water Quality Control Board
ROWD	Report of Waste Discharge
RUSLE	Revised Universal Soil Loss Equation
RW	Receiving Water
SMARTS	Storm water Multi Application Reporting and Tracking System
SS	Settleable Solids
SSC	Suspended Sediment Concentration
SUSMP	Standard Urban Storm Water Mitigation Plan
SW	Storm Water
SWARM	Storm Water Annual Report Module
SWAMP	Surface Water Ambient Monitoring Program
SWMM	Storm Water Management Model
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
TC	Treatment Control
TDS	Total Dissolved Solids

TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USACOE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WDID	Waste Discharge Identification Number
WDR	Waste Discharge Requirements
WLA	Waste Load Allocation
WET	Whole Effluent Toxicity
WRCC	Western Regional Climate Center
WQBEL	Water Quality Based Effluent Limitation
WQO	Water Quality Objective
WQS	Water Quality Standard

APPENDIX 7:
State and Regional Water Resources Control Board Contacts

NORTH COAST REGION (1)
5550 Skylane Blvd, Ste. A
Santa Rose, CA 95403
(707) 576-2220 FAX: (707)523-0135

SAN FRANCISCO BAY REGION (2)
1515 Clay Street, Ste. 1400
Oakland, CA 94612
(510) 622-2300 FAX: (510) 622-2640

CENTRAL COAST REGION (3)
895 Aerovista Place, Ste 101
San Luis Obispo, CA 93401
(805) 549-3147 FAX: (805) 543-0397

LOS ANGELES REGION (4)
320 W. 4th Street, Ste. 200
Los Angeles, CA 90013
(213) 576-6600 FAX: (213) 576-6640

CENTRAL VALLEY REGION (5S)
11020 Sun Center Dr., #200
Rancho Cordova, CA 95670-6114
(916) 464-3291 FAX: (916) 464-4645

FRESNO BRANCH OFFICE (5F)
1685 E St.
Fresno, CA 93706
(559) 445-5116 FAX: (559) 445-5910

REDDING BRANCH OFFICE (5R)
364 Knollcrest Drive, Ste. 205
Redding, CA 96002
(530) 224-4845 FAX: (530) 224-4857

LAHONTAN REGION (6 SLT)
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(530) 542-5400 FAX: (530) 544-2271

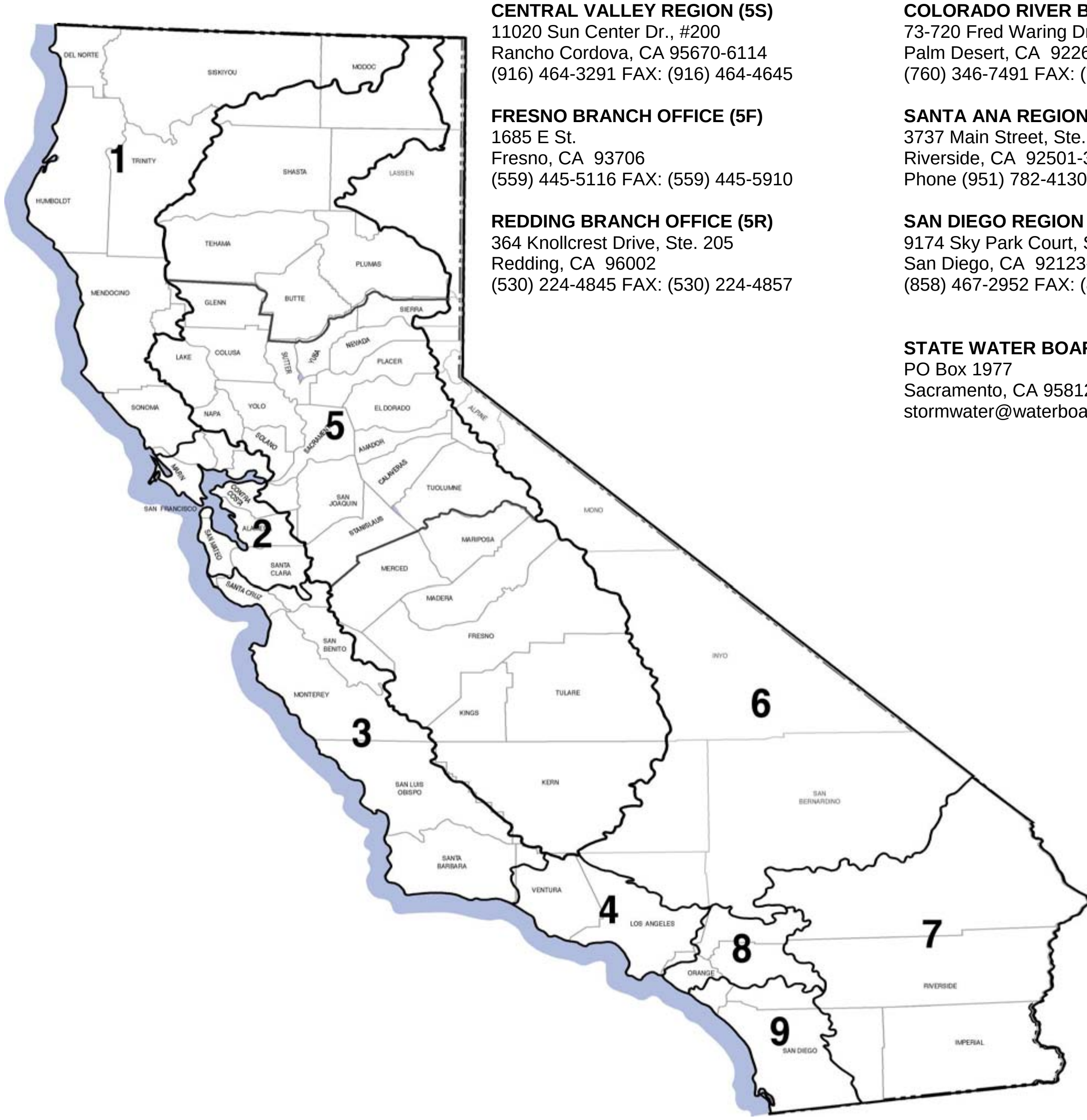
VICTORVILLE OFFICE (6V)
14440 Civic Drive, Ste. 200
Victorville, CA 92392-2383
(760) 241-6583 FAX: (760) 241-7308

COLORADO RIVER BASIN REGION (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491 FAX: (760) 341-6820

SANTA ANA REGION (8)
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
Phone (951) 782-4130 FAX: (951) 781-6288

SAN DIEGO REGION (9)
9174 Sky Park Court, Ste. 100
San Diego, CA 92123-4340
(858) 467-2952 FAX: (858) 571-6972

STATE WATER BOARD
PO Box 1977
Sacramento, CA 95812-1977
stormwater@waterboards.ca.gov



APPENDIX III:

SITE MAP

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Site Map

South Bay Substation Relocation Project

- 12.42-Acre Parcel Boundary
- SDG&E Easement
- Former LNG Site
- Staging Area
- Discharge Point
- Bio Retention Basin
- Drainage Feature
- Wetland Feature
- Limits of Temporary Distrurbance
- Permanent Cut and Fill
- Permanent Substation and Driveways
- Silt Fence
- Fiber Roll
- Gravel Bag
- Stabilized Construction Entrance
- Material Delivery and Storage
- Concrete Waste Management

1:2,500

0 200 400 Feet

SDGE A Sempra Energy utility

INSIGNIA ENVIRONMENTAL

Site Map of the Transmission Lines will be included upon completion.

APPENDIX IV:

CALCULATIONS/ANALYSES/BACKGROUND INFORMATION

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		20
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.32
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		2
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**	12.8	
16	**Site Sediment Risk Factor**	**Low**	
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml **OR** A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml	**no**	**Low**

Region 1 Basin Plan

Region 2 Basin Plan

Region 3 Basin Plan

Region 4 Basin Plan

Region 5 Basin Plan

Region 6 Basin Plan

Region 7 Basin Plan

Region 8 Basin Plan

Region 9 Basin Plan

Combined Risk Level Matrix

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="3">Sediment Risk</th></tr>
<tr><th>Low</th><th>Medium</th><th>High</th></tr>
<tr><th rowspan="2">Receiving Water Risk</th><th>Low</th><td>Level 1</td><td colspan="2">Level 2</td></tr>
<tr><th>High</th><td colspan="2">Level 2</td><td>Level 3</td></tr>
</table>

Project Sediment Risk:	**Low**
Project RW Risk:	**Low**
Project Combined Risk:	**Level 1**

RUNOFF COEFFICIENT CALCULATION SHEET

(All measurements are in acres)

Total Site Area		=	70.4	(A)

Existing Site Conditions (Before Construction)

Impervious Site Area[1]		=	9.6	(B)
Impervious Site Area Runoff Coefficient [2, 4]		=	0.95	(C)
Pervious Site Area[3]		=	60.8	(D)
Pervious Site Area Runoff Coefficient[4]		=	0.35	(E)
Existing Site Area Runoff Coefficient	$\frac{(B \times C) + (D \times E)}{(A)}$	=	0.43	(F)

Proposed Site Conditions (After Construction)

Impervious Site Area[1]		=	12.4	(G)
Impervious Site Area Runoff Coefficient [2, 4]		=	0.95	(H)
Pervious Site Area[3]		=	58.0	(I)
Pervious Site Area Runoff Coefficient[4]		=	0.35	(J)
Proposed Site Area Runoff Coefficient	$\frac{(G \times H) + (I \times J)}{(A)}$	=	0.46	(K)

All measurements are in acres.

Footnotes:
1. Includes paved areas, areas covered by buildings, and other impervious surfaces.
2. Use 0.95 unless lower or higher runoff coefficient can be verified.
3. Includes areas of vegetation, most unpaved or uncovered soil surfaces, and other pervious areas.
4. See the table on the following page for typical C values.

RUN-ON FLOWS CALCULATION SHEET

Design Formula for "Rational Method": Q = C x I x A

Where:	Q	=	Flow (cfs)
	C	=	Coefficient
	I	=	Rainfall Intensity (in/hr)
	A	=	Area of Watershed (acres)

Assuming: 10-minute duration
2-year storm

C (Coefficient)(See above runoff coefficient charts)	=	N/A	
I (Rainfall Intensity)(See for online calculations)	=	N/A	in/hr
A (Area)(Estimate area that drains toward construction area. 1 acre = 43,560 sq ft.)	=	N/A	acres
Approximate Run-on Flow	=	N/A*	cfs

* There is no run-on anticipated.

Storm Water Pollution Prevention Plan Request Form will be included upon completion.

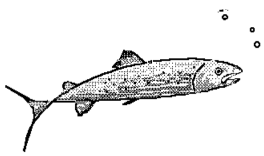
CHAPTER 3
WATER QUALITY OBJECTIVES

TABLES

PHOTOS

3. WATER QUALITY OBJECTIVES

INTRODUCTION



The purpose of this chapter is to designate the water quality objectives for all surface and ground waters in the Region. These water quality objectives are necessary to protect the beneficial uses designated in Chapter 2.

California Water Code (Water Code) section 13050(h) defines "*water quality objectives*" as follows:

"*The limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.*"

By definition, water quality objectives must protect the most sensitive of the beneficial uses which have been designated for a water body. Water quality objectives may be numerical values for water quality constituents or narrative descriptions. Water quality objectives must be based upon sound scientific water quality criteria needed to protect the most sensitive of the beneficial uses which have been designated for a water body. Water quality objectives must be as stringent or more stringent than water quality criteria. Numerous key terms used throughout this chapter are defined in the Glossary which is included as Appendix A of this Basin Plan.

WATER QUALITY OBJECTIVES

Like the designation of beneficial uses, the designation of water quality objectives must satisfy all of the applicable requirements of the Water Code, Division 7 (Porter-Cologne Act) and the Clean Water Act. Water Code section 13241 provides that each Regional Water Quality Control Board shall establish water quality objectives for the waters of the state i.e. (ground and surface waters) which, in the Regional Board's judgment, are necessary for the reasonable protection of beneficial uses and for the prevention of nuisance. The Clean Water Act section 303 requires that the State adopt water quality objectives (called water quality criteria) for surface waters. The requirements of both Acts applicable to the designation of water quality objectives are summarized below.

WATER QUALITY OBJECTIVE DESIGNATION UNDER THE PORTER-COLOGNE WATER QUALITY CONTROL ACT

Significant points regarding the designation of water quality objectives for waters of the state under the Porter-Cologne Act are:

- Water quality objectives must ensure the reasonable protection of beneficial uses and the prevention of nuisance, recognizing that it may be possible for the quality of the water to be changed to some degree without unreasonably affecting beneficial uses. (Water Code section 13241)

- Protection of beneficial uses may not require that water quality objectives protect the existing quality of water. However, water quality objectives cannot be set at a level that would permit water quality to change to such a degree that the beneficial uses designated for protection are unreasonably affected. (Water Code section 13241)

- Water quality objectives must ensure that the water will be suitable for the beneficial uses which have been designated for protection. (Water Code section 13241)

- In establishing water quality objectives, the Regional Board must provide for the reasonable protection of all beneficial uses which are designated for protection, taking into account existing water quality, environmental and economic considerations. Water Code section 13241 provides that the Regional Board shall consider, but is not limited to, the following factors in establishing water quality objectives:

  - Past, present, and probable future beneficial uses of water;

  - Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;

- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;

- Economic considerations;

- The need for developing housing within the region; and

- The need to develop and use recycled water.

WATER QUALITY OBJECTIVE DESIGNATION UNDER THE CLEAN WATER ACT

Section 303 of the Clean Water Act requires the State to submit to the U.S. Environmental Protection Agency (USEPA) for approval, all new or revised water quality standards which are established for surface and ocean waters. Under federal terminology, water quality standards consist of the beneficial uses enumerated in Chapter 2 and the water quality objectives contained in this chapter. Significant points regarding the designation of water quality objectives for surface waters pursuant to the Clean Water Act are:

- Water quality objectives are called water quality criteria in the Clean Water Act.

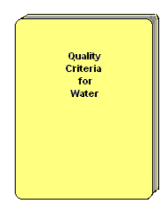
- Water quality criteria (i.e., water quality objectives) are defined as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular surface water use. Water quality criteria are qualitative or quantitative estimates of the concentration of a water constituent which, when not exceeded, will ensure water quality sufficient to protect a designated beneficial use. Water quality criteria should reflect the latest scientific knowledge on the identifiable effects of pollutants on public health and welfare, aquatic life, and recreation [40 CFR 131.3(b)].

- States must adopt water quality criteria (i.e., water quality objectives) that protect designated surface water beneficial uses. For surface waters with multiple beneficial use designations, the water quality criteria shall support the most sensitive beneficial use [40 CFR 131.11(a)(1)].

- States must adopt water quality criteria (i.e., water quality objectives) for surface waters which are based upon USEPA guidance documents or other scientifically defensible methods. Economics are not considered in the development of water quality criteria for surface waters under the Clean Water Act [40 CFR 131.11(b)].

- Water quality criteria (i.e., water quality objectives) for surface waters can be either numeric or narrative specifications for water quality based on physical, chemical and toxicological data, and scientific judgment. Where numerical specifications cannot be established, narrative criteria must be established based upon biomonitoring methods [40 CFR 131.11(b)].

- The term "*water quality criteria*" has two meanings under the federal Clean Water Act. In one context, water quality criteria is equivalent to water quality objectives. In other words, water quality criteria is the standard that a state must impose to protect a surface water beneficial use. In another context, the term "*water quality criteria*" refers to scientific information USEPA has developed on the relationship that the effect of a constituent concentration has on human health, aquatic life, or other uses of water. USEPA has published information in documents such as the "*Gold Book*" (USEPA, 1986) and in various individual criteria documents.



STATE AND FEDERAL ANTIDEGRADATION POLICIES

Water quality objectives must also conform to USEPA regulations covering antidegradation (40 CFR section 131.12) and State Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Application of the antidegradation provisions to the standard setting process requires supporting documentation and appropriate findings whenever a standard (water quality objective or beneficial use) is made less restrictive to accommodate the discharge of pollutants or other activities of man.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FEDERAL ANTIDEGRADATION POLICY

USEPA water quality standards regulations mandated under the Clean Water Act require that each state have an "*antidegradation*" policy for surface waters [40 CFR 131.6(d)]. Each state's policy must, at a minimum, be consistent with the following three principles (hereinafter referred to as the "*federal antidegradation policy*" set forth in 40 CFR 131.12(a):

(1) The first principle requires that all existing instream water uses shall be maintained and protected.

(2) The second principle protects waters whose quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water. For these waters, limited water quality degradation may be allowed if necessary to accommodate important economic or social development in the area in which the waters are located and if the water quality is adequate to protect existing uses fully.

(3) The third principle requires maintenance and protection of all high quality waters which constitute an outstanding national resource.

The federal antidegradation policy serves as a "*catchall*" water quality standard, to be applied where other water quality standards are not specific enough for a particular water body or where other water quality standards do not address a particular pollutant. The policy also serves to provide guidance for standard setting and for other regulatory decisions, to determine when additional control measures should be required to maintain instream beneficial uses or to maintain high quality surface waters. The federal antidegradation policy is not an absolute bar to reductions in surface water quality. Rather, the policy requires that reductions in water quality be justified as necessary to accommodate important social and economic development.

STATE ANTIDEGRADATION POLICY

Water quality objectives for waters of the state must conform to State Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Under State Board Resolution No. 68-16, which applies to all waters of the State, the Regional Board and the State Board must have sufficient grounds to adopt findings which demonstrate that any water quality degradation will:

(1) Be consistent with the maximum benefit to the people of the State;

(2) Not unreasonably affect existing and potential beneficial uses of such water; and

(3) Not result in water quality less than described in the Basin Plan.

Resolution No. 68-16 establishes a general principle of nondegradation, with flexibility to allow some changes in water quality which is in the best interests of the State. Changes in water quality are allowed only where it is in the public interest and beneficial uses are not unreasonably affected. The State Board has interpreted Resolution No. 68-16 as incorporating the three part principles set forth in the federal antidegradation policy. The terms and conditions of Resolution No. 68-16 serve as a general narrative water quality objective in all state water quality control plans. A reprint of Resolution No. 68-16 is provided in the back of this Chapter on page 3-35.

DESIGNATED WATER QUALITY OBJECTIVES

The water quality objectives designated for the waters of the San Diego Region are listed below. These water quality objectives are necessary to protect existing and potential beneficial uses described in Chapter 2 and to protect existing high quality waters of the State.

The water quality objectives will be achieved primarily through the establishment of waste discharge requirements, and through the implementation of this water quality control plan.

The Regional Board, in establishing waste discharge requirements, will consider potential effects on beneficial uses within the area of influence of the discharge, the existing quality of receiving waters, and the appropriate water quality objectives. The Regional Board will make a finding as to the beneficial uses to be protected within the area of influence of the discharge and establish waste discharge requirements to protect those uses and to meet water quality objectives.

The water quality objectives are stated in italics and arranged first by the water body type to which they apply (e.g., all waters; all ocean waters; and all inland surface, enclosed bay and estuaries, coastal lagoons, and ground waters). Within each water body type, the water quality objectives are alphabetized by constituent.

In most cases the water quality objective is preceded by a general description of the constituent limited by the objective. The objectives vary in applicability and scope, reflecting the variety of beneficial uses of water which have been identified. Where numerical limits are specified, they represent the maximum levels of constituents that will allow the beneficial use to continue unimpaired. In other cases, an objective may tolerate natural or "*background*" levels of certain substances or characteristics but no increases over those values, or may express a limit in terms of not adversely affecting beneficial uses. An adverse effect or impact on a beneficial use occurs where there is an actual or threatened loss or impairment of that beneficial use.

GENERAL ANTIDEGRADATION OBJECTIVE

The following objective shall apply to all waters of the State within the Region.

General Antidegradation Water Quality Objective: *Wherever the existing quality of water is better than the quality of water established herein as objectives, such existing quality shall be maintained unless otherwise provided by the provisions of the State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," including any revisions thereto, or the federal Antidegradation Policy, 40 CFR 131.12 (for surface waters only).*

Pacific bonito

OCEAN WATERS

The following objectives shall apply to all ocean waters of the State within the Region:

OCEAN PLAN AND THERMAL PLAN

Ocean Plan and Thermal Plan Water Quality Objective:

The terms and conditions of the State Board's "Water Quality Control Plan for Ocean Waters of California" (Ocean Plan), "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Thermal Plan), and any revisions thereto are incorporated into this Basin Plan by reference. The terms and conditions of the Ocean Plan and Thermal Plan apply to the ocean waters within this Region.

The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters,* Footnote 2, and Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Certain Pacific Ocean shoreline segments of the following Hydrological Units, Areas, and Subareas are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d): San Joaquin Hills HSA 901.11 and Laguna Beach HAS 901.12, Aliso Creek HSA 901.13, Dana Point HSA 901.14, Lower San Juan HSA 901.27, San Clemente HA 901.30, San Luis Rey HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, and Mission San Diego HSA 907.11 and Santee HSA 907.12. Total Maximum Daily Loads have been adopted to address these impairments. See

Chapter 2, Table 2-3, *Beneficial uses of Coastal Waters, Footnotes 1, 6, 9, 10, and 11,* and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Total Maximum Daily Load (TMDL) Implementation Provisions:

For the purposes of a TMDL, the water quality objectives for total coliform, fecal coliform, and/or enterococcus bacteria in ocean waters designated for contact recreation may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

See Chapter 4 (Implementation) for further discussion of this implementation provision.

DISSOLVED OXYGEN

Adequate dissolved oxygen is vital for aquatic life. Depression of dissolved oxygen levels can lead to fish kills and odors resulting from anaerobic decomposition. Dissolved oxygen content in water is a function of water temperature and salinity.

Water Quality Objective for Dissolved Oxygen:

The dissolved oxygen concentration in ocean waters shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials.

HYDROGEN ION CONCENTRATION (pH)

The hydrogen ion concentration of water is called "*pH*". The acidity or alkalinity of water is measured by the pH factor. The pH scale ranges from 1 to 14, with 1 to 6.9 being acid, 7.1 to 14 being alkaline, and 7.0 being neutral. Ranges (pH) of 6.5 to 9.0 are considered harmless. A change of one point on this scale represents a ten-fold increase in acidity or alkalinity. Many pollutants can alter the pH, raising or lowering it excessively. In some cases even small changes in pH can harm aquatic biota. The pH changes can alter the chemical form of certain constituents, thereby increasing their bioavailability and toxicity. For example a decrease in pH can result in an increase in dissolved metal concentrations. Ammonia, which is a major component of sewage discharges, can be completely safe at pH 7.0 and extremely toxic to fish at pH 8.5 for the same total ammonia concentration.

Water Quality Objective for pH:

The pH value shall not be changed at any time more than 0.2 pH units from that which occurs naturally.

INLAND SURFACE WATERS, ENCLOSED BAYS AND ESTUARIES, COASTAL LAGOONS AND GROUND WATERS

The following objectives apply to all inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters of the Region as specified below.

THERMAL PLAN

Thermal Plan Water Quality Objective:

The terms and conditions of the State Board's "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Thermal Plan) and any revisions thereto are incorporated into this Basin Plan by reference. The terms and conditions of the Thermal Plan apply to the Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Lagoons within this Region.

AGRICULTURAL SUPPLY BENEFICIAL USE

Water Quality Objective for Agricultural Supply:

Waters designated for use as agricultural supply (AGR) shall not contain concentrations of chemical constituents in amounts that adversely affect such beneficial use.

AMMONIA, UN-IONIZED

Ammonia is a pungent, colorless, gaseous alkaline compound of nitrogen and hydrogen that is highly soluble in water. Un-ionized ammonia (NH_3) is toxic to fish and other aquatic organisms. In water, NH_3 exists in equilibrium with ammonium (NH_4^+) and hydroxide (OH^-) ions.

The proportions of each change as the temperature, pH, and salinity of the water change.

Water Quality Objective for Un-ionized Ammonia:

The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH_3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.

BACTERIA - TOTAL COLIFORM, FECAL COLIFORM, E.COLI, AND ENTEROCOCCI

Total coliform, fecal coliform, *Escherichia coli* (*E. coli*), and enterococci bacteria are used to indicate the likelihood of pathogens of fecal origin in surface waters. Fecal bacteria (e.g., fecal coliform, *E. coli*, and enterococci) are part of the intestinal biota of warm-blooded animals. Their presence in surface waters is an indicator of potential pollution. Total coliform numbers can include non-fecal bacteria, so additional testing is often done to confirm the presence and numbers of fecal bacteria. Water quality objectives for numbers of total coliform, fecal coliform, *E.coli*, and enterococci vary with the beneficial uses of the water, as described below. The water quality objectives for bacteria are expressed in units of organisms per 100 milliliters of water.

The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters,* Footnote 5, and Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-2, *Beneficial Uses of Inland Surface Waters, Footnote 3* and Chapter 7*, Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Surfer at Ocean Beach, San Diego County

(1) Waters Designated for Contact Recreation (REC-1) Beneficial Use

Fecal Coliform Water Quality Objective for Contact Recreation:

The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 organisms per 100 ml.

In addition, the fecal coliform concentration shall not exceed 400 organisms per 100 ml for more than 10 percent of the total samples during any 30-day period.

Enterococci and E. Coli Water Quality Objectives for Contact Recreation:

The USEPA published E. coli and enterococci bacteriological criteria applicable to waters designated for contact recreation (REC-1) in the Federal Register, Vol. 51, No. 45, Friday, March 7, 1986, 8012-8016.

USEPA BACTERIOLOGICAL CRITERIA FOR WATER CONTACT RECREATION [1,2]
(in colonies per 100 ml)

	Freshwater		*Saltwater*
	Enterococci	*E.coli*	*Enterococci*
Steady State			
(all areas)	*33*	*126*	*35*
Maximum			
(designated beach)	*61*	*235*	*104*
(moderately or lightly used area)	*108*	*406*	*276*
(infrequently used area)	*151*	*576*	*500*

Total Coliform Water Quality Objective for Contact Recreation for Bays and Estuaries:

In bays and estuaries, the most probable number of total coliform organisms in the upper 60 feet of the water column shall be less than 1,000 organisms per 100 ml (10 organisms per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 organisms per 100 ml (10 per ml); and provided further that no single sample as described below is exceeded.

The most probable number of total coliform organisms in the upper 60 feet of the water column in no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 organisms per 100 ml (100 organisms per ml).

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[1] *The criteria were published in the Federal Register, Vol. 51, No. 45/Friday, March 7, 1986/8012-8016. The criteria are based on:*

Cabelli, V. J. 1983. Health Effects Criteria for Marine Recreational Waters. U. S. Environmental Protection Agency, EPA 600/1-80-031, Cincinnati, Ohio.

Dufour, A. P. 1984. Health Effects Criteria for Fresh Recreational Waters. U. S. Environmental Protection Agency, EPA 600/1-84-004, Cincinnati, Ohio.

[2] *The EPA criteria apply to water contact recreation only. The criteria provide for a level of protection based on the frequency of usage of a given water contact recreation area. The criteria may be employed in special studies within this Region to differentiate between pollution sources or to supplement the current coliform objectives for water contact recreation.*

(2) Waters Designated for Non-Contact Recreation (REC-2) Beneficial Use

Fecal Coliform Water Quality Objective for Non-contact Recreation:

In waters designated for non-contact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentrations for any 30-day period, shall not exceed 2,000 organisms per 100 ml nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000 organisms per 100 ml.

(3) Waters Where Shellfish May Be Harvested for Human Consumption (SHELL and COMM) Beneficial Use

Total Coliform Water Quality Objective for Shellfish Harvesting:

In waters where shellfish harvesting for human consumption, commercial or sports purposes is designated (SHELL and COMM), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 organisms per 100 ml nor shall more than 10 percent of the samples collected during any 30-day period exceed 230 organisms per 100 ml for a five-tube decimal dilution test or 330 organisms per 100 ml when a three-tube decimal dilution test is used.

(4) San Diego Bay Waters Used for Whole Fish Handling

E. Coli Water Quality Objective for Whole Fish Handling for San Diego Bay:

In San Diego Bay where bay waters are used for whole fish handling, the density of E. coli shall not exceed 7 organisms per ml in more than 20 percent of any 20 daily consecutive samples of bay water.

(5) Total Maximum Daily Load (TMDL) Implementation Provisions

For the purposes of a TMDL, the following provisions may be used to implement bacteria water quality objectives:

The water quality objectives for fecal coliform bacteria for contact recreation may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

The water quality objectives for enterococci and/or *E. coli* in freshwater and/or saltwater may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

The water quality objectives for coliform organisms in bays and estuaries may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

The water quality objectives for fecal coliform bacteria for non-contact recreation may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

See Chapter 4 (Implementation) for a further discussion of this implementation provision.

BIOSTIMULATORY SUBSTANCES

Excessive growth of algae and/or other aquatic plants can degrade water quality. Algal blooms sometimes occur naturally; however, they are often the result of waste discharges or nonpoint source pollutants. Algal blooms depress the dissolved oxygen content of water and can result in fish kills. Algal blooms can also lead to problems with taste, odors, color, and increased turbidity. Floating algal scum and algal mats are also an aesthetically unpleasant nuisance. This general condition is known as eutrophication.

Water Quality Objectives for Biostimulatory Substances:

Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.

Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1 , on a weight to weight basis shall be used.

Inland surface waters shall not contain biostimulatory substances in concentrations in excess of the numerical objectives described in Table 3-2.

Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 2, Beneficial Uses Table 2-2. Beneficial Uses of Inland Surface Waters, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22, Footnote 3 and Chapter 7, Total Maximum Daily Loads.

Note - Certain exceptions to the above water quality objectives are described in Chapter 4 in the sections titled Discharges to Coastal Lagoons from Pilot Water Reclamation Projects and Discharges to Inland Surface Waters.

BORON

Boron occurs as sodium borate (borax) or as calcium borate (colemanite) in mineral deposits and natural waters of southern California. Boron is not considered harmful in drinking waters in concentrations up to 30 mg/l. Boron is an essential element for the growth of plants but there is no evidence that it is required by animals. Naturally occurring concentrations of boron should have no effect on aquatic life. Concentrations of boron in irrigation waters in excess of 0.75 (milligrams per liter) mg/l may be deleterious to sensitive plants such as citrus. The maximum safe concentration of boron for even the most tolerant

Oranges

plants is about 4.0 mg/l. The United States Environmental Protection Agency (USEPA) has established a water quality criterion for boron of 0.75 mg/l for long term-term irrigation on sensitive crops. This criterion is found in *Quality Criteria for Water, 1986* - the "*Gold Book*". Additional information regarding boron concentrations in irrigation waters is presented in Table 3-1.

Water Quality Objectives for Boron:

Inland surface waters shall not contain boron in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain boron in concentrations in excess of the numerical objectives described in Table 3-3.

Table 3-1. Guidelines for Interpretation of Water Quality for Irrigation[a]

Potential Irrigation Problem	Units	Degree or Restriction on use		
		None	Slight to Moderate	Severe
Salinity (affects crop water availability)				
Electrical Conductivity (EC_w[b])	ds/m or mmho/cm	< 0.7	0.7 - 3.0	> 3.0
TDS	mg/l	< 450	450 – 2,000	> 2,000
Permeability (affects infiltration rate of water into soil. Evaluate using EC_w and Sodium Adsorption Ratio (SAR) together) [c, d]				
SAR =		**and EC** w =		
0 - 3		> 0.7	0.7 - 0.2	< 0.2
3 - 6		> 1.2	1.2 - 0.3	< 0.3
6 - 12		> 1.9	1.9 - 0.5	< 0.5
12 - 20		> 2.9	2.9 - 1.3	< 1.3
20 - 40		> 5.0	5.0 - 2.9	< 2.9
Specified ion toxicity (affects sensitive crops)				
Sodium (Na) [e,f]				
surface irrigation	SAR	< 3	3 - 9	> 9
sprinkler irrigation	mg/l	< 70	> 70	-----
Chloride (Cl) [e,f]				
surface irrigation	mg/l	< 140	140 - 350	> 350
sprinkler irrigation	mg/l	< 100	> 100	-----
Boron (B)	mg/l	< 0.7	0.7 - 3.0	> 3.0
Miscellaneous effects (affects susceptible crops)				
Nitrogen (Total-N) [g]	mg/l	< 5	5 - 30	> 30
Bicarbonate (HCO_3) (overhead sprinkler only)	mg/l	< 90	90 - 500	> 500
pH	normal range	6.5 - 8.4		
Residual chlorine (overhead sprinkler only)	mg/l	< 1.0	1.0 - 5.0	> 5.0

Endnotes for Table 3-1

a. Interpretations are based on possible effects of constituents on crops and/or soils. Guidelines are flexible and should be modified when warranted by local experience or special conditions of crop, soil, and method of irrigation. Table 3-1 is based on Table 3-4 contained in "*Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual,*" California State Water Resources Control Board, Report Number 84-1, July 1984.

b. EC_w means electrical conductivity of the irrigation water, reported in mmho/cm or ds/m. TDS means total dissolved solids, reported in mg/l.

c. SAR means sodium adsorption ratio. SAR is sometimes reported as R_{Na}. At a given SAR, infiltration rate increases as salinity (EC_w) increases. Evaluate the potential permeability problem by SAR and EC_w in combination.

$$SAR = \frac{Na}{\sqrt{\frac{(Ca + Mg)}{2}}}$$ Where Na, Ca, and Mg are in milliequivalents per liter.

d. For wastewaters, it is recommended that the SAR be adjusted to include a more correct estimate of calcium in the soil water following an irrigation. The adjusted sodium adsorption ratio (adj RNa) calculated by this product is to be substituted for the SAR value.

$$SAR = \frac{Na}{\sqrt{\frac{(Ca_x + Mg)}{2}}}$$ Where Na, Ca, and Mg are in milliequivalents per liter.

Ca_x is a modified Ca value calculated using Table 3-2, contained in "*Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual.*"

e. Most tree crops and woody ornamentals are sensitive to sodium and chloride; use the values shown. Most annual crops are not sensitive; use the salinity tolerance tables. For boron sensitivity, refer to boron tolerance tables.

f. With overhead sprinkler irrigation and low humidity (<30%), sodium or chloride greater than 70 or 100 mg/l, respectively, have resulted in excessive leaf absorption and crop damage to sensitive crops.

g. Total nitrogen should include nitrate-nitrogen, ammonia-nitrogen, and organic-nitrogen. Although forms of nitrogen in wastewater vary, the plant responds to the total nitrogen.

Table 3-2. Water Quality Objectives

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters			Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
				TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN JUAN HYDROLOGIC UNIT			**901.00**													
Laguna	HA		1.10	1,000	400	500	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Mission Viejo	HA		1.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Clemente	HA		1.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Mateo Canyon	HA		1.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Onofre	HA		1.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
SANTA MARGARITA HYDROLOGIC UNIT			**902.00**													
Ysidora	HA		2.10	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Deluz	HA		2.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Deluz Creek	HSA	b	2.21	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Gavilan	HSA	b	2.22	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Murrieta	HA		2.30	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Auld	HA		2.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Pechanga	HA		2.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Wolf	HSA	b	2.52	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Wilson	HA		2.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Cave Rocks	HA		2.70	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Aguanga	HA		2.80	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Oakgrove	HA		2.90	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

HA – Hydrologic Area

HSA – Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN LUIS REY HYDROLOGIC UNIT		**903.00**													
Lower San Luis	HA	3.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Monserat	HA	3.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Warner Valley	HA	3.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
CARLSBAD HYDROLOGIC UNIT		**904.00**													
Loma Alta	HA	4.10	-	-	-	-	-	-	-	-	-	none	20	20	1.0
Buena Vista Creek	HA	4.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Agua Hedionda	HA	4.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Encinas	HA	4.40	-	-	-	-	-	-	-	-	-	none	20	20	1.0
San Marcos	HA	4.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Escondido Creek	HA	4.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
SAN DIEGUITO HYDROLOGIC UNIT		**905.00**													
Solana Beach	HA	5.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Hodges	HA	5.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Pasqual	HA	5.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Santa Maria Valley	HA	5.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Santa Ysabel	HA	5.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

HA – Hydrologic Area

HSA – Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
PENASQUITOS HYDROLOGIC UNIT		**906.00**													
Miramar Reservoir	HA	6.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Poway	HA	6.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Scripps	HA	6.30	-	-	-	-	a	-	-	-	-	none	20	20	-
Miramar	HA	6.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Tecolote	HA	6.50	-	-	-	-	a	-	-	-	-	none	20	20	-
SAN DIEGO HYDROLOGIC UNIT		**907.00**													
Lower San Diego	HA	7.10	1,000	400	500	60	a	0.3	0.05	0.5	1.0	none	20	20	-
Mission San Diego	HSA	7.11	1,500	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
Santee	HSA c	7.12	1,000	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
Santee	HSA d	7.12	1,500	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
San Vicente	HA	7.20	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
El Capitan	HA	7.30	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Boulder Creek	HA	7.40	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
PUEBLO SAN DIEGO HYDROLOGIC UNIT		**908.00**													
Point Loma	HA	8.10	-	-	-	-	-	-	-	-	-	none	20	20	-
San Diego Mesa	HA	8.20	-	-	-	-	-	-	-	-	-	none	20	20	-
National City	HA	8.30	-	-	-	-	-	-	-	-	-	none	20	20	-
SWEETWATER HYDROLOGIC UNIT		**909.00**													
Lower Sweetwater	HA	9.10	1,500	500	500	60	a	0.3	0.05	0.5	0.75	none	20	20	-
Middle Sweetwater	HA	9.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Upper Sweetwater	HA	9.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

HA – Hydrologic Area

HSA – Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
OTAY HYDROLOGIC UNIT		**910.00**													
Coronado	HA	10.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Otay Valley	HA	10.20	1,000	400	500	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Dulzura	HA	10.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
TIJUANA HYDROLOGIC UNIT		**911.00**													
Tijuana Valley	HA	11.10	-	-	-	-	-	-	-	-	-	-	-	-	-
San Ysidro	HSA	11.11	2,100	-	-	-	a	-	-	-	-	none	20	20	-
Potrero	HA	11.20	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Barrett Lake	HA	11.30	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Monument	HA	11.40	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Morena	HA	11.50	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Cottonwood	HA	11.60	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Cameron	HA	11.70	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Campo	HA	11.80	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0

HA – Hydrologic Area

HSA – Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Endnotes for Table 3-2

a Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total Phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisances in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N: P=10:1 shall be used. Note - Certain exceptions to the above water quality objectives are described in Chapter 4 in the sections titled Discharges to Coastal Lagoons from Pilot Water Reclamation Projects and Discharges to Surface Waters.

b These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from it's beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).

c Sycamore Canyon Subarea, a portion of the Santee Hydrologic Subarea, includes the watersheds of the following north-south trending canyons: Oak Creek, Spring Canyon, Little Sycamore Canyon, Quail Canyon, and Sycamore Canyon. The Sycamore Canyon subarea extends eastward from the Mission San Diego HSA to the confluence of the San Diego River and Forester Creek, immediately south of the Santee Lakes.

d These objectives apply to the Lower Sycamore Canyon portion of the Santee Hydrologic Subarea described as all of the Sycamore Canyon watershed except that part which drains north of the boundary between sections 28 and 33, Township 14 South, Range 1 West.

Table 3-3. Water Quality Objectives

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water			Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
				TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN JUAN HYDROLOGIC UNIT			**901.00**													
Laguna	HA		1.10													
San Joaquin Hills	HSA		1.11	1,200	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Laguna Beach	HSA		1.12	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Aliso	HSA		1.13	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Dana Point	HSA		1.14	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Mission Viejo	HA		1.20													
Oso	HSA		1.21	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper Trabuco	HSA		1.22	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Middle Trabuco	HSA		1.23	750	375	375	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Gobernadora	HSA		1.24	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper San Juan	HSA		1.25	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Middle San Juan	HSA		1.26	750	375	375	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Lower San Juan	HSA		1.27	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Ortega	HSA		1.28	1,100	375	450	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
San Clemente	HA		1.30													
Prima Deshecha	HSA		1.31	1,200	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Segunda Deshecha	HSA		1.32	1,200	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
San Mateo Canyon	HA	[a]	1.40	500 [b]	250	250 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
San Onofre	HA	[a]	1.50	500 [b]	250	250 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
SANTA MARGARITA HYDROLOGIC UNIT			**902.00**													
Ysidora	HA	[a]	2.10	750 [c]	300 [c]	300 [c]	60	10 [c]	0.3 [c]	0.05 [c]	0.5	0.75 [c]	none	5	15	1.0
Deluz	HA		2.20	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table.)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
Deluz Creek	HSA [m]	2.21	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Gavilan	HSA [m]	2.22	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Murrieta	HA	2.30	750 [c]	300 [c]	300 [c]	60	10 [c]	0.3 [c]	0.05 [c]	0.5	0.75 [c]	none	5	15	1.0
Domenigoni	HSA	2.35	2,000	-	-	-	-	-	-	-	-	-	-	-	-
Auld	HA	2.40	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Pechanga	HA	2.50	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Pauba	HSA [o]	2.51	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Wolf	HSA [p]	2.52	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Wilson	HA	2.60	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Cave Rocks	HA	2.70	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Aguanga	HA	2.80	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Oakgrove	HA	2.90	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
SAN LUIS REY HYDROLOGIC UNIT		**903.00**													
Lower San Luis	HA	3.10	800 [r]	300	400	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Mission	HSA [a]	3.11	1,500 [cd]	500 [cd]	500 [cd]	60	45 [cd]	0.85 [cd]	0.15 [cd]	0.5 [d]	0.75 [cd]	none	5	15 [d]	1.0 [d]
Bonsall	HSA	3.12	1,500 [cd]	500 [cd]	500 [cd]	60	45 [cd]	0.85 [cd]	0.15 [cd]	0.5 [d]	0.75 [cd]	none	5	15 [d]	1.0 [d]
Moosa	HSA	3.13	1,200 [r]	300	400	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Valley Center	HSA	3.14	1,100 [r]	300	400	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Monserate	HA	3.20													
Pala	HSA	3.21	900 [c]	300 [c]	500 [c]	60	15 [c]	0.3 [c]	0.05 [c]	0.5	0.75	none	5	15	1.0
Pauma	HSA	3.22	800 [c]	300 [c]	400 [c]	60	10 [c]	0.3 [c]	0.05 [c]	0.5	0.75	none	5	15	1.0
La Jolla Amago	HSA	3.23	500	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
Warner Valley	HA	3.30	500	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
CARLSBAD HYDROLOGIC UNIT		**904.00**													
Loma Alta	HA	4.10	-	-	-	-	-	-	-	-	-	-	-	-	-

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water			Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
				TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
Buena Vista Creek	HA		4.20													
El Salto	HSA	[a]	4.21	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Vista	HSA	[a]	4.22	1,000 [b]	400 [b]	500 [b]	60	10 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Agua Hedionda	HA	[a]	4.30	1,200	500	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Los Monos	HSA	[a j]	4.31	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Encinas	HA	[a]	4.40	3,500 [b]	800 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
San Marcos	HA	[a e]	4.50	1,000	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Batiquitos	HSA	[a e k]	4.51	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Escondido Creek	HA	[a]	4.60	750	300	300	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
San Elijo	HSA	[a]	4.61	2,800	700	600	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Escondido	HSA		4.62	1,000	300	400	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
SAN DIEGUITO HYDROLOGIC UNIT			**905.00**													
Solana Beach	HA	[a]	5.10	1,500 [b]	500 [b]	500 [b]	60	45 [b]	0.85 [b]	0.15 [b]	0.5	0.75 [b]	none	5	15	1.0
Hodges	HA		5.20	1,000 [b]	400 [b]	500 [b]	60	10 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
San Pasqual	HA		5.30	1,000 [b]	400 [b]	500 [b]	60	10 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Santa Maria Valley	HA		5.40	1,000	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Santa Ysabel	HA		5.50	500	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
PENASQUITOS HYDROLOGIC UNIT			**906.00**													
Miramar Reservoir	HA	[a f]	6.10	1,200	500	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Poway	HA		6.20	750 [q]	300	300	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Scripps	HA		6.30	-	-	-	-	-	-	-	-	-	-	-	-	-
Miramar	HA	[g]	6.40	750	300	300	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Tecolote	HA		6.50	-	-	-	-	-	-	-	-	-	-	-	-	-

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table.)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN DIEGO HYDROLOGIC UNIT		**907.00**													
Lower San Diego	HA	7.10													
Mission San Diego	HSA [a]	7.11	3,000 [b]	800 [b]	600 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
Santee	HSA	7.12	1,000 [b]	400 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Santee (alluvial aquifer for lower Sycamore Canyon)	HSA [n]	7.12	2,000 [b]	800 [b]	600 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
El Cajon	HSA	7.13	1,200 [b]	250 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Coches	HSA	7.14	600 [b]	250 [b]	250 [b]	60	5 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
El Monte	HSA	7.15	600 [b]	250 [b]	250 [b]	60	5 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
San Vicente	HA	7.20	600	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
El Capitan	HA	7.30	1,000	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Conejos Creek	HSA	7.31	350	60	60	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
Boulder Creek	HA	7.40	350	60	60	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
PUEBLO SAN DIEGO HYDROLOGIC UNIT		**908.00**													
Point Loma	HA [i]	8.10	-	-	-	-	-	-	-	-	-	-	-	-	-
San Diego Mesa	HA [i]	8.20	-	-	-	-	-	-	-	-	-	-	-	-	-
National City	HA [i]	8.30	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
SWEETWATER HYDROLOGIC UNIT		**909.00**													
Lower Sweetwater	HA	9.10													
Telegraph	HSA	9.11	3,000 [b]	750 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 b	0.5	2.0 [b]	none	5	15	1.0
La Nacion	HSA	9.12	1,500 [b]	500 [b]	500 [b]	60	45 [b]	0.3 [b]	0.15 b	0.5	0.75 [b]	none	5	15	1.0
Middle Sweetwater	HA	9.20	1,000	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper Sweetwater	HA	9.30	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table.)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
OTAY HYDROLOGIC UNIT		**910.00**													
Coronado	HA	10.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Otay Valley	HA	10.20	1,500 [b]	500 [b]	500 [b]	60	10 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Otay Valley	HA [l]	10.20	-	-	-	-	-	-	-	-	-	none	-	-	-
Dulzura	HA	10.30	1,000	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
TIJUANA HYDROLOGIC UNIT		**911.00**													
Tijuana Valley	HA [h]	11.10	2,500 [b]	550 [b]	900 [b]	70	-	-	-	-	2.0 [b]	none	-	-	-
Potrero	HA	11.20	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Barrett Lake	HA	11.30	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Monument	HA	11.40	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Morena	HA	11.50	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Cottonwood	HA	11.60	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Cameron	HA	11.70	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Campo	HA	11.80	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table.)

Endnotes for Table 3-3

a The water quality objectives do not apply westerly of the easterly boundary of Interstate Highway 5. The objectives for the remainder of the Hydrologic Area (Subarea) are as shown.

b Detailed salt balance studies are recommended for this area to determine limiting mineral concentration levels for discharge. On the basis on existing data, the tabulated objectives would probably be maintained in most areas. Upon completion of the salt balance studies, significant water quality objective revisions may be necessary. In the interim period of time, projects of ground water recharge with water quality inferior to the tabulated numerical values may be permitted following individual review and approval by the Regional Board if such projects do not degrade existing ground water quality to the aquifers affected by the recharge.

Endnotes for Table 3-3 (continued)

c The recommended plan would allow for measurable degradation of ground water in this basin to permit continued agricultural land use. Point sources, however, would be controlled to achieve effluent quality corresponding to the tabulated numerical values. In future years demineralization may be used to treat ground water to the desired quality prior to use.

d A portion of the Upper Mission Basin is being considered as an underground potable water storage reservoir for treated imported water. The area is located north of Highway 76 an the boundary of hydrologic subareas 3.11 and 3.12. If this program is adopted, local objectives approaching the quality of the imported water would be set and rigorously pursued.

e The water quality objectives do not apply to hydrologic subareas 4.51 and 4.52 between Highway 78 and El Camino Real and to all lands which drain to Moonlight Creek, Cottonwood Creek and Encinitas Creek. The objectives for the remainder of the Hydrologic Area are as shown.

f The water quality objectives do not apply to all lands which drain to Los Penasquitos Canyon from 1.5 miles west of Interstate Highway 15. The objectives for the remainder of the Hydrologic Area are as shown.

g The water quality objectives do not apply west of Interstate Highway 15. The objectives for the remainder of the Hydrologic Area are as shown.

h The water quality objectives do not apply west of Hollister Street. The objectives for the remainder of the Hydrologic Area are as shown.

i No significant amount of ground water in this unit.

j The water quality objectives apply to the portion of Subarea 4.31 bounded on the west by the easterly boundary of the Interstate 5 right-of-way and on the east by the easterly boundary of El Camino Real.

k The water quality objectives apply to the portion of Subarea 4.51 bounded on the south by the north shore of Batiquitos Lagoon, on the west by the easterly boundary of the Interstate 5 right-of-way and on the east by the easterly boundary of El Camino Real.

l The water quality objectives apply to the portion of the Otay HA 10.20 limited to lands within and tributary to Salt Creek on the east and Poggi Canyon on the west and including the several smaller drainage courses between these tributaries of the Otay River.

m These objectives apply to the alluvial ground water beneath the Santa Margarita River from the confluence of Murrieta and Temecula Creeks through the Gavilan and DeLuz HSAs to a depth of 100 feet and a lateral distance equal to the area of the floodplain covered by a 10 year flood event. These objectives do not apply to ground water in any of the basins beneath DeLuz, Sandia, and Rainbow Creeks and other unnamed creeks, which are tributaries of the Santa Margarita River.

Endnotes for Table 3-3 (continued)

n These objectives apply for only the alluvial aquifer in the Lower Sycamore Canyon portion of the Santee Hydrologic Subarea described as all of the Sycamore Canyon watershed except that part which drains north of the boundary between sections 28 and 33, Township 14 South, Range 1 West.

o These objectives apply to ground waters within 250 feet of the surface for the most downstream 4,200 acres of the Pauba HSA (2.51) which drain directly to the most downstream 2.7 mile segment of Temecula Creek. Excluded from this area are all lands upgradient from a point 0.5 miles east of the intersection of Butterfield Stage Road and Highway 79.

p These objectives apply to ground waters within 250 feet of the surface for the most downstream 2,800 acres of the Wolf HSA (2.52) including those portions of the HSA which drain directly to the most downstream 1.5 mile segment of Pechanga Creek. Excluded from this area are all lands of HSA 2.52 which are upgradient of the intersection of Pala Road and Via Eduardo.

q These objectives apply to ground waters of the Poway HSA (6.2) that lie east of the San Diego County Water Authority's (SDCWA) First Aqueduct. Ground water quality objectives west of the SDCWA First Aqueduct are 1,000 mg/l.

r The total dissolved solids (TDS) objective for the alluvial aquifer in the Moosa Hydrologic Subarea (903.13) is 1,200 mg/l. The TDS objective for the alluvial aquifer in the Valley Center Hydrologic Subarea (903.14) is 1,100 mg/l.

CHLORIDES

Most waters contain chlorides because they are present in many rock types and are very soluble in water. Chlorides may be of natural mineral origin or derived from (a) seawater intrusion of ground water supplies, (b) salts spread on fields for agricultural purposes, (c) human or animal sewage or (d) industrial wastes. Chlorides may impart a salty taste to drinking water in concentrations between 100 - 700 mg/l. The secondary drinking water standard for chlorides is 500 mg/l. Elevated chloride concentrations in waters used for industrial process and supply can significantly increase the corrosion rate of steel and aluminum. High chloride concentrations can be toxic to plant life. A safe concentration of chloride for irrigation water is considered to be in the range of 100 - 140 mg/l. Irrigation with water containing 140 - 350 mg/l of chloride may cause slight to moderate plant injury. Additional information regarding chloride concentrations in irrigation waters is presented in Table 3-1.

Water Quality Objectives for Chlorides:

Inland surface waters shall not contain chlorides in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain chlorides in concentrations in excess of the numerical objectives described in Table 3-3.

COLOR

Color in water may arise naturally, such as from minerals, plant matter, or algae, or may be caused by industrial pollutants. Color is primarily an aesthetic consideration, although it can discolor clothes and food. The secondary drinking water standard for color is 15 color units.

Water Quality Objectives for Color:

Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

The natural color of fish, shellfish or other resources in inland surface waters, coastal lagoon or bay and estuary shall not be impaired.

Inland surface waters shall not contain color in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain color in concentrations in excess of the numerical objectives described in Table 3-3.

DISSOLVED OXYGEN

Adequate dissolved oxygen levels are vital for aquatic life. Depression of dissolved oxygen levels can lead to fish kills and odors resulting from anaerobic decomposition. Dissolved oxygen content in water is a function of water temperature and salinity.

Water Quality Objective for Dissolved Oxygen:

Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.

FLOATING MATERIAL

Floating material is an aesthetic nuisance as well as a substrate for algae and insect vectors.

Water Quality Objective for Floating Material:

Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.

FLUORIDE

Fluoride does not naturally occur in high concentrations in surface waters, but may occur in detrimental concentrations in ground waters. Fluoride, in sufficient quantities, can adversely affect waters used as industrial process or supply in food, beverages, and pharmaceutical industries. The presence of optimal concentrations of fluoride in drinking water supplies can reduce dental decay, especially among children. However, fluoride concentrations in excess of approximately 1.0 mg/l can increase the risk of mottled enamel in children and dental fluorosis in adults.

Water Quality Objectives for Fluoride:

Inland surface waters shall not contain fluoride in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain fluoride in concentrations in excess of the numerical objectives described in Table 3-3.

HYDROGEN ION CONCENTRATION (pH)

The hydrogen ion concentration of water is called "pH". The acidity or alkalinity of water is measured by the pH factor. The pH scale ranges from 1 to 14, with 1 to 6.9 being acid, 7.1 to 14 being alkaline, and 7.0 being neutral. Ranges (pH) of 6.5 to 9.0 are considered harmless. A change of one point on this scale represents a ten-fold increase in acidity or alkalinity. Many pollutants can alter the pH, raising or lowering it excessively. In some cases even small changes in pH can harm aquatic biota. The pH changes can alter the chemical form of certain constituents, thereby increasing their bioavailability and toxicity. For example, a decrease in pH can result in an increase in dissolved metal concentrations. Ammonia, which is a major component of sewage discharges, can be completely safe at pH 7.0 and extremely toxic to fish at pH 8.5 for the same total ammonia concentration.

Water Quality Objectives for pH:

Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR), or estuarine (EST), or saline (SAL) beneficial uses. Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated cold freshwater habitat (COLD) or warm freshwater habitat (WARM) beneficial uses.

In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0.

In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.

INORGANIC CHEMICALS - PRIMARY STANDARDS

Water Quality Objective for Domestic or Municipal supply:

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of inorganic chemicals in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22, Table 64431-A of section 64431 (Inorganic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-4).

Table 3-4. Maximum Contaminant Levels for Inorganic Chemicals specified in Table 64431-A of section 64431 of Title 22 of the California Code of Regulations as amended June 12, 2003.

Chemical	Maximum Contaminant Level, mg/l
Aluminum	1.
Antimony	0.006
Arsenic	0.05
Asbestos	7 MFL*
Barium	1.
Beryllium	0.004
Cadmium	0.005
Chromium	0.05
Cyanide	0.15
Fluoride	2.0
Mercury	0.002
Nickel	0.1
Nitrate (as NO_3)	45.
Nitrate + Nitrite (sum as nitrogen)	10.
Nitrite (as nitrogen)	1.
Selenium	0.05
Thallium	0.002

MFL = million fibers per liter, MCL for fibers exceeding 10 um in length.

IRON

Iron may be present in water due to natural origin, corrosion of metallic iron and its alloys by water in the presence of oxygen, and industrial waste discharges containing iron. Iron is undesirable in domestic water supplies because it causes unpleasant tastes, deposits on food during cooking, stains and discolors laundry and plumbing fixtures. The secondary drinking water standard for iron is 0.3 mg/l.

Water Quality Objectives for Iron:

Inland surface waters shall not contain iron in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain iron in concentrations in excess of the numerical objectives described in Table 3-3.

MANGANESE

Manganese is undesirable in domestic water supplies because it causes unpleasant tastes, deposits on food during cooking, stains and discolors laundry and plumbing fixtures, and fosters the growth of some microorganisms in reservoirs, filters, and distribution systems. The secondary drinking water standard for manganese is 0.05 mg/l.

Water Quality Objectives for Manganese:

Inland surface waters shall not contain manganese in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain manganese in concentrations in excess of the numerical objectives described in Table 3-3.

METHYLENE BLUE - ACTIVATED SUBSTANCES

The methylene blue-activated substances (MBAS) test measures the presence of anionic surfactant (commercial detergent) in water. Positive test results can be used to indicate the presence of domestic wastewater. The secondary drinking water standard for MBAS is 0.5 mg/l.

Water Quality Objectives for MBAS:

Inland surface waters shall not contain MBAS in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain MBAS in concentrations in excess of the numerical objectives described in Table 3-3.

NITRATE

High nitrate concentrations in domestic water supplies can be toxic to human life. Infants are particularly susceptible and may develop methemoglobinemia (blue baby syndrome). The primary drinking water standard for nitrate as NO_3 is 45 mg/l.

Water Quality Objectives for Nitrate:

Inland surface waters shall not contain nitrate (as NO_3) in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain nitrate (as NO_3) in concentrations in excess of the numerical objectives described in Table 3-3.

OIL AND GREASE

Oil and grease can be present in water as a result of the discharge of treated wastes and the accidental or intentional dumping of wastes into sinks and storm drains. Oils and related materials have a high surface tension and are not soluble in water, therefore forming a film on the water's surface. This film can result in nuisance conditions because of offensive odors and visual impacts. Oil and grease can coat birds and aquatic organisms, adversely affecting respiration and/or thermoregulation.

Water Quality Objective for Oils, Grease, Waxes or other Materials:

Waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses.

ORGANIC CHEMICALS - PRIMARY STANDARDS

Water Quality Objectives:

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).

Table 3-5. Maximum Contaminant Levels for Organic Chemicals specified in Table 64444-A of section 64444 of Title 22 of the California Code of Regulations as amended June 12, 2003.

Chemical	Maximum Contaminant Level, mg/l
(a) Volatile Organic Chemicals (VOCs)	
Benzene	0.001
Carbon Tetrachloride	0.0005
1,2-Dichlorobenzene	0.6
1,4-Dichlorobenzene	0.005
1,1-Dichloroethane	0.005
1,2-Dichloroethane	0.0005
1,1-Dichloroethylne	0.006
cis-1,2-Dichloroethylene	0.006
trans-1,2-Dichloroethylene	0.01
Dichloromethane	0.005
1,2-Dichloropropane	0.005
1,3-Dichloropropene	0.0005
Ethylbenzene	0.3
Methyl-*tert*-butyl ether	0.013
Monochlorobenzene	0.07
Styrene	0.1
1,1,2,2-Tetrachloroethane	0.001
Tetrachloroethylene	0.005
Toluene	0.15
1,2,4-Trichlorobenzene	0.005
1,1,1-Trichloroethane	0.200
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Trichlorofluoromethane	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2
Vinyl Chloride	0.0005
Xylenes	1.750*
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)	
Alachlor	0.002
Atrazine	0.001
Bentazon	0.018
Benzo(a)pyrene	0.0002
Carbofuran	0.018
Chlordane	0.0001
2,4-D	0.07
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.004
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene Dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.00001
Heptachlor Epoxide	0.00001
Hexachlorobenezene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.03
Molinate	0.02
Oxamyl	0.05
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated Biphenyls	0.0005
Simazine	0.004
Thiobencarb	0.07
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,3,5-TP (Silvex)	0.05

* MCL is for either a single isomer or the sum of the isomers.

PERCENT SODIUM AND ADJUSTED SODIUM ADSORPTION RATIO

Excess concentrations of sodium in irrigation water reduce soil permeability to water and air. The deterioration of sodium in irrigation water is cumulative and is accelerated by poor drainage.

Table 3-1 shows concentration guidelines for sodium, boron, chloride and other chemical constituents present in irrigation waters.

The specific water quality objective for sodium in the Basin Plan is expressed as percent sodium. Percent sodium is calculated as follows:

$$\% Na = \frac{Na}{Na + Ca + Mg + K} \times 100\ \%$$

where sodium (Na), Calcium (Ca), Magnesium (Mg), and Potassium (K) are expressed in milliequivalent per liter (me/l).

The percent sodium objective was developed for the protection of agricultural uses from the potential hazard due to sodium in irrigation waters. The value of 60% sodium is based upon *Water Quality Criteria*, by McKee and Wolf, 1963.

McKee and Wolf note that because of all the variables involved, the classification of waters for irrigation use must be somewhat arbitrary and the limits set cannot be too rigid. The three general classifications of irrigation waters are:

CLASS	%SODIUM	DESCRIPTION
I	<30 - 60%	Excellent to good, or suitable for most plants under most conditions.
II	30 - 75%	Good to injurious, harmful to some plants under conditions of soil, climate and practices.
III	70 - 75%	Injurious to unsatisfactory, unsuitable under most conditions.

Since the publication of the percent sodium criteria, technical research has resulted in the development of more applicable criteria for addressing the potential sodium hazard in irrigation water.

The sodium adsorption ratio (SAR) and adjusted sodium adsorption ratios ($Adj.\ SAR$) are measures of the potential hazard in soils due to sodium. SAR and $Adj.\ SAR$ are similar to percent sodium in that their calculated values provide an indication of a soil's potential for permeability and potential aeration problems. However, by taking into consideration the soil's sodicity and the exchange phases between Ca, Na and Mg, the SAR and $Adj.\ SAR$ predict potential sodium build up in soils. The $Adj.\ SAR$ calculation further takes into account the effects of carbonate and bicarbonate ion concentrations of a soil. $Adj.\ SAR$ is the most common method for determining sodium hazard in irrigation water at the present time.

The calculation for SAR is as follows:

$$SAR = \frac{Na}{\sqrt{\dfrac{(Ca + Mg)}{2}}}$$

where Na, Ca and Mg are in me/l.
The calculation for $Adj.\ SAR$ is as follows:

$$Adj.\ SAR = \frac{Na}{\sqrt{\dfrac{(Ca_x + Mg)}{2}}}$$

where Na and Mg are in me/l.

Ca_x is a modified Ca value, calculated using the Suarez table (Table 3-3, contained in *Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual*, California State Water Resources Control Board, Report Number 84-1, July 1984). Ca_x takes into account salinity (EC_w), the HCO_3/CO_3 ratio (me/l) and the estimated partial pressure of CO_2 in the top few millimeters of the soil ($P_{CO_2} = 0.0007$ atmospheres).

Water Quality Objectives for Sodium:

Inland surface waters shall not contain percent sodium in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain percent sodium in excess of the numerical objectives described in Table 3-3.

In some cases, adjusted sodium adsorption ratio may be a better indicator of the potential sodium hazard in irrigation water than percent sodium. The Regional Board Executive Officer may authorize the use of adjusted sodium absorption ratio instead of percent sodium to indicate the potential sodium hazard. In such cases, the adjusted sodium adsorption ratio shall not exceed the slight to moderate range of values referenced in Table 3-1 "Guidelines for Interpretation of Water Quality for Irrigation".

PESTICIDES

Pesticides can enter surface and ground waters directly through industrial process discharges, agricultural discharge, spillage and illegal dumping. Pesticides can also enter surface and ground waters indirectly by drifting away from areas where pesticides are being sprayed, through surface runoff from treated fields, and by leaching or return flows from irrigation. Pesticides can concentrate in plant or animal tissues and many are considered to be carcinogenic to humans. Although many pesticides are designed to deteriorate rapidly when exposed to sunlight and air, they may persist for months or years in water.

California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) establishes maximum contaminant levels for pesticides in drinking water. (See water quality objective for Organic Chemicals).

Water Quality Objectives for Pesticides:

No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

PHENOLIC COMPOUNDS

Phenolic compounds are in widespread use as industrial and agricultural chemical intermediates for the preparation of other chemicals. These organic compounds are byproducts of petroleum refining, tanning, and textile, dye, and resin manufacturing. Low concentrations cause taste and odor problems in water, higher concentrations can kill aquatic life and humans. Phenol is occasionally referred to as "*carbolic acid*".

Water Quality Objectives for Phenolic Compounds:

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of phenolics in excess of 1.0 ug/l.

Should there be any conflict between this limit and those described under the Organic Chemicals objective the more stringent standards shall apply at all times.

RADIOACTIVITY

Water Quality Objective for Radioactivity:

Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.

Water Quality Objective for Radionuclides:

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the levels specified in section 64441 of Title 22 of the California Code of Regulations (Natural Radioactivity) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect.

SECONDARY DRINKING WATER STANDARDS

Water Quality Objective for Domestic or Municipal Supply Water:

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in Table 64449-A of section 64449 of Title 22 of the California Code of Regulations (Secondary Maximum Contaminant Levels, Consumer Acceptance Limits) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-6).

Table 3-6. Secondary Maximum Contaminant Levels for Consumer Acceptance Limits specified in Table 64449-A of section 64449 of Title 22 of the California Code of Regulations as amended January 7, 1999.

Constituent	Maximum Contaminant Levels
Aluminum	0.2 mg/l
Color	15 units
Copper	1.0 mg/l
Corrosivity	Noncorrosive
Foaming Agents (MBAS)	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Methyl-*tert*-butyl ether (MTBE)	0.005 mg/l
Odor Threshold	3 units
Silver	0.1 mg/l
Thiobencarb	0.001 mg/l
Turbidity	5 units
Zinc	5.0 mg/l

SEDIMENT

Suspended sediment in surface waters can cause harm to aquatic organisms by abrasion of surface membranes, interference with respiration, and sensory perception in aquatic fauna. Suspended sediment can reduce photosynthesis in and survival of aquatic flora by limiting the transmittance of light.

Water Quality Objective for Sediment:

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

SUSPENDED AND SETTLEABLE SOLIDS

Suspended and settleable solids are deleterious to benthic organisms and may cause the formation of anaerobic conditions. They can clog fish gills and interfere with respiration in aquatic fauna. They also screen out light, hindering photosynthesis and normal aquatic plant growth and development.

Water Quality Objective for Suspended and Settleable Solids:

Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.

SULFATE

The most important sources of sulfate in native waters of the San Diego Region are the gypsiferous deposits and sulfide minerals associated with crystalline rocks. Excessive sulfate concentrations in drinking water can cause laxative effects to new users of the water supply. The recommended secondary drinking water standard for sulfate is 250 mg/l with a upper limit of 500 mg/l.

Water Quality Objectives for Sulfate:

Inland surface waters shall not contain sulfate in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain sulfate in concentrations in excess of the numerical objectives described in Table 3-3.

TASTES AND ODORS

Undesirable tastes and odors in water may be a nuisance and may indicate the presence of pollutants. The secondary drinking water standard for odor (threshold) is 3 odor units.

Water Quality Objectives for Taste and Odor:

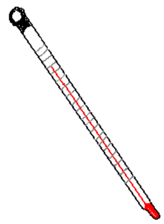
Waters shall not contain taste or odor producing substances at concentrations which cause a nuisance or adversely affect beneficial uses.

The natural taste and odor of fish, shellfish or other Regional water resources used for human consumption shall not be impaired in inland surface waters and bays and estuaries.

Inland surface waters shall not contain odors in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain odors in concentrations in excess of the numerical objectives described in Table 3-3.

TEMPERATURE



Waste discharges can cause temperature changes in the receiving waters which adversely affect the aquatic biota. Discharges most likely to cause these temperature effects are cooling water discharges from power plants.

Water Quality Objectives for Temperature:

The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses.

At no time or place shall the temperature of any COLD water be increased more than 5°F above the natural receiving water temperature.

TOTAL DISSOLVED SOLIDS

Dissolved solids in natural waters may consist of carbonates, bicarbonates, chlorides, sulfates, phosphates, nitrates, magnesium, sodium, iron, manganese and other substances. The recommended secondary drinking water standard for total dissolved solids is 500 mg/l with a upper limit of 1000 mg/l due to taste considerations. High total dissolved solids concentrations in irrigation waters can be deleterious to plants directly, or indirectly through adverse effects on soil permeability. A classification of irrigation waters with respect to total dissolved solids concentration is described in Table 3-1.

Water Quality Objectives for Total Dissolved Solids:

Inland surface waters shall not contain total dissolved solids in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain total dissolved solids in concentrations in excess of the numerical objectives described in Table 3-3.

TOXICITY

Toxicity is the adverse response of organisms to chemicals or physical agents.

Water Quality Objectives for Toxicity:

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in USEPA, State Water Resources Control Board or other protocol authorized by the Regional Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, Beneficial Uses of Inland Surface Waters, Footnote 3 and Chapter 7, Total Maximum Daily Loads.

TOXIC POLLUTANTS

The USEPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California on May 18, 2000 (The California Toxics Rule or "CTR;" [40 CFR 131.38]). CTR criteria constitute applicable water quality criteria in California. In addition to the CTR, certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality criteria in California as well.

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

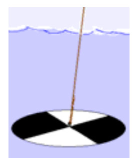
Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, *Beneficial Uses of Inland Surface Waters, Footnote 3* and Chapter 7, Total Maximum Daily Loads.

TRIHALOMETHANES

Chlorine is the dominant chemical agent used to disinfect treated water and wastewater. Trihalomethanes are formed when chlorine reacts with aquatic organic material found in water and wastewater. Trihalomethanes are a group of light weight chlorinated hydrocarbons which are suspected carcinogens. The USEPA has established a maximum contaminant level for total trihalomethanes of 0.1 mg/l in *Title 40, Code of Federal Regulations, Part 141.12, (40 CFR 141.12), EPA National Primary Drinking Water Regulations (§141.12 revised at 57 FR 31838, July 17, 1992).* Total trihalomethanes are the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform). The federal regulations on trihalomethanes are incorporated by reference into CCR, Title 22, Chapter 15, Articles 4.5, sections 64439.

Water Quality Objective for Trihalomethanes:

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of trihalomethanes in excess of the criteria set forth in California Code of Regulations, Title 22, section 64439 which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to section 64439 as the changes take effect.



TURBIDITY

The turbidity of water is attributable to suspended and colloidal matter, the effect of which is to disturb clearness and diminish the penetration of light. High turbidity levels can adversely affect the use of water for drinking. By interfering with the penetration of light, turbidity can adversely affect photosynthesis which aquatic organisms depend upon for survival. High concentrations of particulate matter that produce turbidity can be directly lethal to aquatic life.

Water Quality Objectives for Turbidity:

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Inland surface waters shall not contain turbidity in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain turbidity in excess of the numerical objectives described in Table 3-3.

The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of a standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed natural areas and dredging projects conducted in conformance with waste discharge requirements of the Regional Board. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

Natural Turbidity	*Maximum Increase*
0-50 NTU	*20% over natural turbidity level*
50-100 NTU	*10 NTU*
Greater than 100 NTU	*10% over natural turbidity level*

In addition, within San Diego Bay, the transparency of bay waters, insofar as it may be influenced by any controllable factor, either directly or through induced conditions, shall not be less than 8 feet in more than 20 percent of the readings in any zone, as measured by a standard Secchi disk. Wherever the water is less than 10 feet deep, the Secchi disk reading shall not be less than 80 percent of the depth in more than 20 percent of the readings in any zone.

WATER QUALITY OBJECTIVES OF INLAND SURFACE WATERS

Specific numerical water quality objectives for inland surface waters are presented by hydrologic area and subarea and watershed in Table 3-2.

The water quality objectives for inland surface water designations described in this table correspond with the beneficial use designations previously described in Chapter 2. Water Quality Objective variations occur in some of the hydrologic areas, subareas and stream reaches. Water quality variations from the objectives may also occur within a given hydrologic area subarea or stream reach. Such local variations will be evaluated when waste discharge requirements, NPDES permits, Cleanup and Abatement Orders, and Cease and Desist Orders are being developed for a given discharger.

The omission of mineral objectives for some areas corresponds to the lack of beneficial uses (AGR, MUN, IND) requiring such objectives.

WATER QUALITY OBJECTIVES OF GROUND WATERS

Specific numerical water quality objectives for ground waters are presented by hydrologic area and subarea in Table 3-3.

A footnote for some ground water basins is listed to show that some water quality objectives are considered tentative until detailed salt balance studies are conducted.

In 1978 the Regional Board, in Resolution No. 78-6, deleted water quality objectives and beneficial uses for certain portions of basins 1.10, 1.20, 1.30, 1.40, 1.50, 2.10, 3.10, 4.10, 4.20, 4.30, 4.40, 4.50, 4.60, 5.10, 6.10, 7.10, and 11.10. Table footnotes are included to identify these basins. The Regional Board elected to delete beneficial uses in portions of these basins, where the uses of ground water were marginal or nonexistent, to promote wastewater reclamation by sewage treatment plants. The deletion of beneficial uses in these areas was based upon a determination that the loss of ground water supplies was outweighed by the long-term increase in wastewater reclamation made possible by allowing reclaimed water discharges which are high in total dissolved solids. It is the Regional Board's intent to protect the water quality in these basins under the terms of State Board Resolution No. 68-16.

For purposes of intrusion barrier formation or ground water recharge, the water quality objective qualifications footnoted in Table 3-3 allow, with approval of the Regional Board, discharge of reclaimed water in areas of equal or poorer ground water quality. Relatively poor quality water could also be used for intrusion barrier formation along the coast.

WATER QUALITY CRITERIA

The literature contains many different water quality criteria designed to protect specific beneficial uses of water. A summary of the specific numerical water quality criteria considered by the Regional Board for designation as water quality objectives is described in Appendix C. The water quality criteria described in Appendix C are not enforceable water quality objectives. The purpose of presenting the information summarized in these tables is to allow interested persons to compare available water quality criteria to the specific water quality objectives designated by the Regional Board described earlier in this Chapter.

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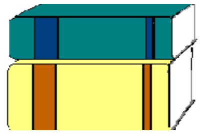

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REPRINT OF RESOLUTION NO. 68-16

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 68-16

STATEMENT OF POLICY WITH RESPECT TO
MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA

WHEREAS the California Legislature has declared that it is the policy of the State that the granting of permits and licenses for unappropriated water and the disposal of wastes into the waters of the State shall be so regulated as to achieve highest water quality consistent with maximum benefit to the people of the State and shall be controlled so as to promote the peace, health, safety and welfare of the people of the State; and

WHEREAS water quality control policies have been and are being adopted for waters of the State; and

WHEREAS the quality of some waters of the State is higher than that established by the adopted policies and it is the intent and purpose of this Board that such higher quality shall be maintained to the maximum extent possible consistent with the declaration of the Legislature;

NOW, THEREFORE, BE IT RESOLVED:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

3. In implementing this policy, the Secretary of the Interior will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Secretary of the Interior as part of California's water quality control policy submission.

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 24, 1968.

Dated: October 28, 1968
Original signed by
Kerry W. Mulligan, Executive Officer
State Water Resources Control Board

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APPENDIX V:

CONSTRUCTION MATERIALS

Appendix V
Potential Materials Used or Stored

Activity	Typical Materials	
Asphalt Work	Asphalt (conventional and rubberized) Cold mix Asphalt emulsion Asphalt releases – Monocyclic Terpet	Liquid asphalt Aluminate Aluminum sulfate Chip seal, seal coat, tack coat, slurry seal or fog seal
Concrete Work	Concrete curing compound – resin based “Monkey blood” (a retardant compound used for concrete curing) Arbitolor Arabitol (1,2,3,4,5-pentane pentol) pH from concrete sawing or freshly placed or washed off Portland cement products	Diesel fuel (sprayed on wooden forms as a non-sticking compound between concrete and wood) Cement Concrete mix Concrete slurry
Cleaning	Various citrus based cleaners Solvents Thinners De-greasers Acids	Bases Detergents Trisodium phosphate Sodium Hypochlorite
Vehicle and Equipment	Oil, Grease, Fuel Grease Coolant/antifreeze Diesel Battery Acid Ammonium Hydroxide	Gasoline Lubricants Hydraulic and/or brake fluid Adhesives (glues, caulk, sealants) Diesel de-icer
Pipe Work	Pipe joint compound PVC primers	
Painting	Paints Thinners Mineral spirits	Latex paint (propylene glycol) Epoxy Silicone
Electrical Work (Materials and Equipment)	Wooden electrical utility poles Electrical transformers and other electrical equipment Pole anchors Guy wires	Conductor cable Stub supports Electrical distribution wire
Horizontal Bore Work	Poly pipe Steel pipe Pipe skids or blocks	Welding rods Miscellaneous steel fittings Metal and plastic pipelines Cable and conduit
Activity	Typical Materials	
Landscaping	Herbicides Pesticides Fertilizers	Mulch Compost

Activity	Typical Materials	
Brick Work	Etching compounds Acid wash of brick work	
Soil Stabilization	Wood fiber mulch Compost Wood and bark chips Straw mulch Emulsified asphalt Lime	Plant gums Bonded fiber matrix Coconut fiber Paper mulch Grass Various proprietary products
Woodwork	Lumber treatment/ preservative Water sealants Stains Sawdust	
Structural finishing	Plaster Fire retardants Epoxies Mastic Coating	Paints (see painting) Tar Urethane
Other	Fire Extinguisher Insulator Gas – Sulfur hexafluoride	

TESTING REQUIREMENTS FOR POLLUTANTS NOT VISUALLY DETECTABLE – DUE TO BREACH, MALFUNCTION, LEAKAGE, OR SPILL

Pollutant Source	Field Test[1]	Laboratory Test[1]
Demolition		
Paint Strippers	N/A	Volatile Organics
Solvents	N/A	Volatile Organics
Adhesives	N/A	Semi-Volatile Organics
Vehicle Fuels	N/A	Oil and Grease or TPH
Metals	N/A	Total/Dissolved Metals
Bacteria	N/A	Total/Fecal Coliform
Grading/Utility Installation		
Fuels/Lubricants	N/A	Oil and Grease/TPH
Chlorinated Water	Colorimetric	
Concrete	pH	Lab pH
Fertilizers	N/A	$NO_3/NH_3/P$
Bacteria	N/A	Total/Fecal Coliform
Paving		
Asphalt (liquid)	N/A	TPH
Structure Construction		
Paint Strippers	N/A	Volatile Organics
Solvents, Thinners	N/A	Volatile Organics
Detergents	Colorimetric	MBAS
Adhesives, Sealants, Resins	N/A	Semi-Volatile Organics
Fuels, Lubricants, Hydraulic Fluid	N/A	Oil and Grease or TPH
Concrete	pH	Lab pH
Bacteria	N/A	Total/Fecal Coliform
Organics	N/A	Semi-Volatile Organics
Acid Wash	pH	Lab pH
Landscaping		
Nutrients (Fertilizers)	N/A	$NO_3/NH_3/P$
Pesticides/Herbicides	N/A	Pesticide Scan/Semi-Volatile Organics
Bacteria	N/A	Total/Fecal Colilform
1 Based on consultation with SWPPP preparer or monitoring specialist		

Inventory of Potential Pollutant Sources Planned to Be Used or Stored at the Project Site will be included upon completion.

APPENDIX VI:

CONSTRUCTION BMPs

BEST MANAGEMENT PRACTICES MANUAL FOR WATER QUALITY CONSTRUCTION

M A N U A L

BEST MANAGEMENT PRACTICES MANUAL FOR WATER QUALITY CONSTRUCTION

Geosyntec Project No. SW0186

December 2010, Rev 2- Geosyntec Consultants
Revised July 2011, San Diego Gas & Electric Environmental Services Department

Table of Contents

Why Is There A Need for This Manual?

Sempra Energy's Environmental Policy states in part, "Sempra Energy believes in treating the Earth's resources with respect. We are committed to protecting and conserving the environment and the health and the safety of our employees, our customers, and the diverse communities in which we operate and provide service." Therefore, Sempra Energy companies will:

- Meet applicable environmental laws, regulations, and permit requirements.
- Join customers, civic leaders and other community leaders in providing sound and responsible stewardship of our environment.
- Incorporate appropriate environmental management and compliance in strategic planning and operational decisions."

Municipalities (Cities, Counties, and Special Districts) have passed storm water ordinances intended to protect storm sewer systems and receiving water bodies from sediment, chemical, and biological pollutants. These ordinances require storm water Best Management Practices (BMPs) for construction projects and construction activities that disturb soil. Due to the numerous municipalities in the San Diego Gas & Electric (SDG&E) service territory, there is a need to consolidate the various municipal BMP requirements for consistent and cost effective construction practices. This manual has been written to supplement the operational procedures of SDG&E to meet the municipal storm water ordinance requirements within SDG&E's service territory. Municipal storm water ordinances include prohibitions regarding erosion, sedimentation and discharge of other pollutants without reference to soil disturbance area and include construction "like" activities that include construction or operation and maintenance activities that can impact the municipal storm water conveyance systems. These activities include saw cutting, potholing, trenching, excavation (including trench and excavation dewatering) and stockpiling. Therefore, this BMP manual is applicable to the above construction and construction "like" activities, including field operations and maintenance activities, regardless of soil disturbance area or its location. This manual is also applicable to construction "like" activities at SDG&E facilities, such as Construction & Operations (C&O) facilities, supplementing the Facility Storm Water Management Plan (SWMP) or Storm Water Pollution Prevention Plan (SWPPP) BMPs.

Construction or demolition activities that include any land disturbance of one (1) acre or more are subject to storm water control regulations in the California Construction General Storm Water Discharge Permit (CGP) established by the California State Water Resources Control Board (SWRCB) Order No. 2009-009-DWQ. This CGP has many new requirements compared to the previous permit (Order No. 99-08-DWQ) and requires electronic submittal of the Notice of Intent (NOI), risk assessment, site map, project specific SWPPP, and annual report requirements. Projects subject to the CGP must establish a project-specific construction site risk level based on the site-specific sediment discharge risk and the site's receiving water risk. These two factors are used to determine the project risk, which is assigned as Risk Level 1, 2, or 3 for traditional (non-linear) projects or Type 1, 2, or 3 for linear underground/overhead (LUP) projects. CGP requirements are more stringent for higher Risk Levels or Types. The CGP established numeric discharge limits for turbidity and pH for Risk Level/Type 2 and 3 sites. All projects risk levels/types must implement minimum BMPs and perform visual monitoring in accordance with the CGP. In addition, the CGP has specific certification requirements for those that prepare SWPPPs (i.e., "Qualified SWPPP Developers") and those that implement requirements in the field (i.e., "Qualified SWPPP Practitioners").

The purpose is to update the manual and BMP details to reflect requirements of the new California Construction General Storm Water Discharge Permit (CGP) (California State Water Resources Control Board (SWRCB) Order No. 2009-009-DWQ), which became effective on July 1, 2010 as well as to update information related to SDG&E operations and activities.

Many of the construction activities of SDG&E are linear in nature, unique to utility work, and do not correspond to typical large development project BMPs. There is a continuing need to tailor typical BMPs to utility type work and utility work crews. This manual incorporates the above mandates of Sempra Energy's Environmental Policy. The manual is the result of surveying the available governmental, association, and industry sources of construction BMPs, and the selection and editing of BMPs appropriate to SDG&E construction activities and personnel.

A Note Regarding Impacts to Construction Cost and Scheduling

It is important for a project's or activity's budget and schedule to include BMP selection, implementation and maintenance costs and time horizons into the design and construction of a project. It is also important that there is a mechanism to hand-off the BMP portion of a project to the appropriate SDG&E Operations and Maintenance Department for final stabilization and post-project permanent BMP maintenance (including final and post-construction costs). A project's field Environmental Representative will be able to assist in estimating and incorporating these costs and scheduling considerations into the project or construction activity.

BMP PROGRAM OVERVIEW

Water Quality Construction BMP Manual

The purpose of this Water Quality Construction BMP Manual (Manual) is to provide standardized BMPs to reduce or eliminate pollutants in runoff from SDG&E construction projects and construction activities for water quality protection. This Manual applies to SDG&E's construction projects and activities that disturb soil. This manual also applies to SDG&E's contractors performing such work as part of their contractual obligations. SDG&E's service area encompasses approximately 4,000 square miles of diverse terrain from Southern Orange County to the Mexican border. Many of SDG&E's projects and work activities throughout the service area are subject to coverage under the National Pollutant Discharge Elimination System (NPDES) CGP and its conditions, and/or local municipal storm water ordinance requirements. Because of the breadth of jurisdictions and requirements that apply to SDG&E's utility construction projects and activities, this Manual has been developed to provide a consistent approach to water quality management to be applied by SDG&E and their contractors throughout the SDG&E service area.

Most construction projects performed by SDG&E are linear projects which are often short term, and are low impact on narrow corridors of land. Many of the BMPs presented in this Manual have used the best and most practical pollution prevention features from several sources, such as the SWRCB, the California Stormwater Quality Association (CASQA), local municipalities, and California Department of Transportation (Caltrans) BMP Manuals, that have been modified to integrate into our utility construction activities but are also compliant with the applicable regulations and ordinances.

This Manual is organized into three main sections:

- BMP Program Overview.
- BMP Selection and Implementation.
- BMP Details.

The BMP Details section is divided into four functional BMP categories:

- Sediment Controls.
- Waste and Materials Management Controls.
- Non-Storm Water Discharge Controls.
- Erosion Control.

Within each of these categories, specific information, including "What," "When," "Where" and "How" to implement the BMP, plus maintenance and inspection information, are provided for each BMP. Pictures and diagrams are also provided for many of the BMPs for easy reference. Photographs provided in this Manual have been primarily obtained from URS Corporation, Geosyntec Consultants, California Department of Transportation (Caltrans), CASQA, and SDG&E.

The Manual is a tool designed to assist with the identification of BMPs appropriate for use on a construction or activity site. The Manual provides guidance to SDG&E for meeting regulatory water quality requirements for utility construction and maintenance activities that involve disturbance of soil. The BMP selection process provides users with guidance for the selection of typical BMPs that may apply to standard SDG&E construction activities. During BMP selection, the users of this Manual should take into account the benefits and limitations of each of the BMPs considered in the context of the site conditions. Finally, BMP success is contingent not only on appropriate selection and implementation, but also on the coordination and communication between project management, Field Environmental Representatives, and the field construction teams.

BMP PROGRAM OVERVIEW

Utility Type Projects

Most SDG&E projects are very different from commercial or residential developments, building sites, and Caltrans projects. Many SDG&E projects are smaller, short term, and impact narrow corridors of land. SDG&E projects are constantly progressing along the route. Often, SDG&E projects are in the right-of-ways of streets or along SDG&E utility corridors that must be maintained to ensure safe access to gas and electric lines and where temporary BMPs are initially installed for a short period of time during construction, followed by soil stabilization BMPs as necessary.

Training Program

Training for construction storm water pollution prevention and control is part of SDG&E's overall Water Quality Pollution Prevention Program. All applicable company employees and contractors hired by the company have the responsibility to comply with environmental laws, regulations, and permit requirements. Training for the prevention of environmental-related incidents is conducted for applicable SDG&E employees who perform any operation or activity that has the potential to cause a pollutant to be released into the environment, including construction activity. Records are maintained as to when employees have received this training and instruction.

Contractor responsibilities, including environmental training of their employees, are specified in the terms and conditions of the contract between SDG&E and the contractor.

Applicable employees should know and contact their local Field Environmental Representatives for support and guidance on any aspects of the training program.

BMP SELECTION AND IMPLEMENTATION

General Protocol BMP

To select BMPs that are appropriate for a given project, the following steps should be followed:

Step 1 – In the project's design phase, identify "Permanent" or "Structural" BMPs required by the local municipality or the CGP. These BMPs are often stated in the requirements as "Post-Construction" or "Permanent" BMPs.
Step 2 – Identify construction activities and the associated pollutants and issues of concern
Step 3 – Evaluate site conditions and select applicable BMPs
Step 4 – Implement, monitor, and maintain the BMPs

Step 1 – Identify "Permanent" or" Structural" BMPs required by Local Municipalities and/or the SWRCB General Construction Storm Water Permit.

Municipalities may have a Standard Urban Stormwater Mitigation Plan (SUSMP) or equivalent, and other requirements such as a requirement for conformance with the California Green Building Standards Code (CalGreen Code). These Plans and Codes may require:

- Permanent stabilization of exposed soil surfaces and slopes to minimize erosion and sedimentation. Stabilization structures and/or the planting of vegetation may be required.
- Matching post-construction runoff to pre-construction runoff, utilizing the 85th percentile storm event to reduce the risk of impact to the receiving water's channel morphology and provide some protection of water quality.
- Use of Low Impact Development (LID) practices. LID practices are environmentally sustainable practices that benefit water supply and contributes to water quality protection. Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility or outfall, LID takes a different approach by using site design and storm water management to maintain the site's pre-development runoff rates and volumes. LID practices include; Impervious surface reduction & disconnection; bio-retention facilities or rain gardens, grass swales and channels, vegetated rooftops, rain barrels, cisterns, vegetated filter strips, and permeable pavements.

Step 2 – Identify Activities, Pollutants, and Issues of Concern

The second step in BMP selection is to identify the construction activities, the associated potential pollutants, and the local issues of concern. Construction activities may include saw cutting, potholing, trenching, excavation, stockpiling of soil, grading and grubbing, new access road construction, paving, or other activities with the potential to impact storm water and non- storm water discharges. Pollutants of concern may include: sediment; petroleum products such as fuel, oil, and grease from vehicle and equipment operation; paving materials such as concrete and asphalt components; other materials used or stored on site, such as pesticides, herbicides, fertilizer, detergents, paint, adhesives, and solvents; and project wastes such as litter, debris, hazardous wastes, and liquid wastes. The local issues of concern may include:

- Proximity to sensitive receiving waters (environmentally sensitive areas or Clean Water Act Section 303(d) listed water bodies, particularly those meeting the criteria for "sediment sensitive" receiving waters identified in the CGP, example: Upper Newport Bay
- Local regulatory requirements influencing BMP selection, or timing of BMP implementation.

BMP SELECTION AND IMPLEMENTATION

Step 3 – Evaluate Site Conditions and Select BMPs

To assist in BMP selection, this Manual presents BMPs that are anticipated to be most applicable to utility construction projects and construction activities. Most SDG&E utility projects are unique in that they are typically very short-term, low impact on narrow corridors of land, and have minimal exposure of soil or transportable materials at any one time to storm water. The selector should consider any project-specific requirements or factors such as BMP effectiveness, cost, availability, feasibility, and suitability for the site. For example, important site conditions to consider include the amount of soil disturbance, anticipated weather conditions, soil type and erodibility, flow path length, and slope of exposed soil. Selected BMPs can and should be modified to suit the scope of the project and site conditions.

Table 1 presents guidelines for BMP selection and implementation at a construction site. Table 2 presents a BMP selection worksheet for utility activities. These implementation guidelines and selection worksheet can be used to select BMPs for a specific project or construction activity. Finally, a selector may discover a better BMP for their situation not listed in Tables 1 or 2. The Environmental Services Department encourages creative and practical pollution prevention techniques. These new techniques can be shared with others to support the water quality goals of the region.

Step 4 – Implement, Monitor, and Maintain the BMP System

It is important that selected BMPs be implemented in a sequence that maximizes protection of water quality, be monitored regularly for effectiveness and be maintained as necessary throughout the project. Appropriate BMPs must be implemented year round. Additional BMPs will be implemented when needed, and/or when a storm event is forecasted or occurs. Table 1 presents a suggested schedule for BMP implementation and sequencing. Steps in this schedule should be reviewed for each project as applicable. All BMPs should be monitored and inspected regularly and particularly before and after rain events, or in compliance with the frequency specified in the CGP, if applicable. BMPs should be maintained during a project in accordance with the procedures outlined in the BMP Details Section.

BMP Installation Contractors and BMP Material Suppliers

Construction crews will implement most BMPs. This Manual identifies some SDG&E utility activities and operations that may require outside contractors to install the applicable BMPs. As needed, please consult with the Environmental Services Department, Water Quality for the most current contractor listings and contractual arrangements.

BMP SELECTION AND IMPLEMENTATION

Table 1
BMP SELECTION AND SEQUENCING GUIDE

Step No.	Description	What to Do	BMP Options (see Table 2 for BMP activities)
1.	Design Stage and Before Construction	Contact the Field Environmental Representative early, at the beginning of a project, and provide him/her with the project information on the current environmental project information form. This information will allow the Environmental Department to identify environmental concerns such as, but not limited to, permitting requirements, potentially required structural BMPs, and the identification of endangered species and/or impaired water bodies that must be avoided or mitigated. As another example, before construction, it may be necessary to evaluate, mark, and protect important trees and associated rooting zones, unique areas (e.g., wetlands), and other areas to be preserved.	Local SUSMP, CalGreen Code, or General Construction Storm Water Permit requirements 4-01, other user-defined BMPs
2.	Site Access Areas (construction entrances, roadways, equipment parking areas)	Stabilize site entrances and access roads if applicable prior to earthwork.	1-07, other user-defined BMPs
3.	Storm Drain/Drainage Inlet Protection	Install inlet protection at down-gradient inlets that project runoff/tracking might impact.	1-06, other user-defined BMPs
4.	Perimeter Sediment Control	Install perimeter sediment controls (silt fence, fiber rolls, etc.) as applicable prior to soil disturbing activities. Install additional runoff control measures during construction as needed.	1-02, 1-03, 1-04, 1-05, other user-defined BMPs
5.	Material and Waste Storage Areas	Prepare staging areas and material storage and disposal areas, as applicable, to reduce run-on and runoff. Install perimeter control, obtain clean-up materials, plastic covers for stockpiles, etc. prior to storing materials on site.	2-01 through 2-08, 1-08, other user-defined BMPs
6	Drainage Control and Run-on Diversion	Install run-on controls to direct run-on around or through the site to minimize erosion in addition to sediment control measures.	4-01 through 4-13, other user-defined BMPs
7.	Earthwork (trenching, excavation, grading, surface roughening, grubbing)	Begin excavation, trenching, or grading after installing applicable sediment and runoff control measures. Install additional control measures as work progresses as needed.	1-01 through 1-08, other user-defined BMPs
8.	Surface Stabilization (temporary and permanent seeding, mulching)	Apply temporary or permanent soil stabilization measures as applicable on all disturbed areas where work is delayed or completed.	4-01 through 4-08, other user-defined BMPs

Table 1 (continued)
BMP SELECTION AND SEQUENCING GUIDE

Step No.	Description	What to Do	BMP Options (see Table 2 for BMP activities)
9.	Construction and Paving (install utilities, buildings, paving)	Implement applicable control practices as work takes place.	3-01 through 3-9, other user-defined BMPs
10.	Final Stabilization and Landscaping	Stabilize open areas as applicable. Remove temporary control measures and install final stabilization controls appropriately (topsoil, trees and shrubs, permanent seeding, mulching, sod, riprap)	3-07, 4-03, 4-04, other user-defined BMPs

Table 2
BMP SELECTION WORKSHEET FOR UTILITY ACTIVITIES

Utility BMP No.	BMP Options	Construction						Maint. and Repair				
		Overhead Electric	Underground Electric	Potholing	Underground Gas	Boring/Directional Drilling	Pipe Spans	Gen. Maint. and Repair	Inspect and Repair	Tree Trimming	Veg. Control	Other
Section 1 Sediment Controls												
Choose from one or more of the following BMP options when applicable:												
BMP 1-01	Scheduling											
BMP 1-02	Silt Fence											
BMP 1-03	Fiber Rolls											
BMP 1-04	Gravel Bag Berm											
BMP 1-05	Sand Bag Barrier											
BMP 1-06	Storm Drain/Drainage Inlet Protection											
BMP 1-07	Tracking Controls											
BMP 1-08	Stockpile Management											
BMP 1-09	Sediment Basin											
BMP 1-10	Sediment Trap											
BMP 1-11	Check Dam											
BMP 1-12	Active Treatment Systems (ATS)											
Other-User Defined	BMP Description:											
Section 2 Waste Management and Material Controls												
Choose from one or more of the following BMP options when applicable:												
BMP 2-01	Material Delivery and Storage											
BMP 2-02	Material Use											
BMP 2-03	Spill Control											
BMP 2-04	Solid Waste Management											
BMP 2-05	Hazardous Materials/Waste Management											
BMP 2-06	Contaminated Soil Management											
BMP 2-07	Sanitary/Septic Waste Management											
BMP 2-08	Liquid Waste/Drilling Fluid Management											
Other-User Defined	BMP Description:											

Table 2 (continued)
BMP SELECTION WORKSHEET FOR UTILITY ACTIVITIES

Utility BMP No.	BMP Options	Construction						Maint. and Repair				
		Overhead Electric	Underground Electric	Potholing	Underground Gas	Boring/Directional Drilling	Pipe Spans	Gen. Maint. and Repair	Inspect and Repair	Tree Trimming	Veg. Control	Other
Section 3 Non-Storm Water Discharge Controls												
Choose from one or more of the following BMP options when applicable:												
BMP 3-01	Dewatering Operations											
BMP 3-02	Paving Operations											
BMP 3-03	Vehicle and Equipment Washing											
BMP 3-04	Vehicle and Equipment Fueling											
BMP 3-05	Concrete/Coring/Saw cutting and Drilling Waste Management											
BMP 3-06	Dewatering Utility Vaults											
BMP 3-07	Over-Water Protection											
BMP 3-08	Paint Removal Control											
BMP 3-09	Temporary Stream Crossing											
BMP 3-10	Clear Water Diversion											
Other-User Defined	BMP Description:											
Section 4 Erosion Control and Soil Stabilization												
Choose from one or more of the following BMP options when applicable:												
BMP 4-01	Preservation of Existing Vegetation											
BMP 4-02	Temporary Soil Stabilization (General)											
BMP 4-03	Hydraulic Mulch											
BMP 4-04	Hydroseeding											
BMP 4-05	Soil Binders											
BMP 4-06	Straw Mulch											
BMP 4-07	Geotextiles, Plastic Covers, and Erosion Control Blankets/Mats											
BMP 4-08	Dust (Wind Erosion) Control											
BMP 4-09	Diversion Berms and Drainage Swales											
BMP 4-10	Velocity Dissipation Devices											
BMP 4-11	Slope Drains											

Table 2 (continued)
BMP SELECTION WORKSHEET FOR UTILITY ACTIVITIES

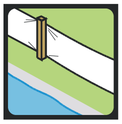
Utility BMP No.	BMP Options	Construction						Maint. and Repair				
		Overhead Electric	Underground Electric	Potholing	Underground Gas	Boring/Directional Drilling	Pipe Spans	Gen. Maint. and Repair	Inspect and Repair	Tree Trimming	Veg. Control	Other
BMP 4-12	Streambank Stabilization											
BMP 4-13	Soil Preparation											
Other-User Defined	BMP Description:											

BMP DETAILS

The previous section provides details for the selection and implementation of BMPs for the most common utility construction activities. Once the BMP objectives are defined, it is necessary to identify the category or categories of BMPs that are best suited to meet each objective.

A category is a grouping of BMPs related in how they prevent pollution. The four categories are:

- **Section 1 – Sediment Controls**
- **Section 2 – Waste Management and Material Controls**
- **Section 3 – Non-Storm Water Discharge Controls**
- **Section 4 – Erosion Control and Soil Stabilization**



Section 1 – Sediment Controls

Why Are Sediment Controls Needed?

Sediment controls are needed to provide a secondary or back-up mechanism to erosion control techniques to prevent sediment discharges from a site. Erosion controls are designed to prevent erosion (the detachment of soil particles from the surface by rain, flowing water or wind), whereas sediment controls are designed to trap soil particles once dislodged by rain, flowing water, or wind. Sediment particles (soil/dust) from construction, operations, and maintenance (construction like) activities can be transported to a different location by wind or water flow. Once these particles have become detached, they can be transported by wind or runoff to water bodies where they can cause damage to aquatic life by burying the animals or plants or reducing oxygen and/or sunlight that is necessary for their survival. Soil particles can also carry other damaging pollutants with them. Displaced sediment from these activities is therefore considered a pollutant by water quality regulatory agencies.

What are Sediment Controls?

Sediment controls include any method that aids in trapping soil particles after they have been detached and moved by wind or water. Sediment controls are usually passive systems that rely on filtering or settling the particles out of the water or wind that is transporting them. The sediment that has accumulated by the BMPs can be redistributed as excess soil on the construction site. Sediment controls are most effective in retaining sediment on site when used in combination with erosion control BMPs. Sediment Controls presented in this Manual include the following:

- BMP 1-01 Scheduling
- BMP 1-02 Silt Fence
- BMP 1-03 Fiber Rolls
- BMP 1-04 Gravel Bag Berm
- BMP 1-05 Sand Bag Barrier
- BMP 1-06 Storm Drain/Drainage Inlet Protection
- BMP 1-07 Tracking Controls
- BMP 1-08 Stockpile Management
- BMP 1-09 Sediment Basin
- BMP 1-10 Sediment Trap
- BMP 1-11 Check Dams
- BMP 1-12 Active Treatment Systems (ATS)

What Scheduling consists of the planning of soil disturbance activities to avoid periods of rain whenever practical.

When Scheduling of soil disturbance activities must be considered year-round.

Where All construction and "construction like" operations and maintenance sites where soil disturbance activities take place.

How Use the following measures as applicable:

- Consider scheduling major soil disturbing activities or activities near environmentally sensitive areas (e.g., adjacent to water bodies) during prolonged periods when no rain is forecast.
- Monitor the weather forecast for seasonable and unseasonable rain events. Obtain weather information from the National Weather Service at
  - www.srh.noaa.gov/
- Print and maintain copies of forecasts to document decisions related to inspections and BMP implementation for projects subject to the CGP.
- Appropriate sediment controls are required year round. Always be prepared to deploy additional erosion and sediment control and soil stabilization BMPs as needed. Off site sediment discharges can occur because of unseasonable rain, vehicle tracking, unanticipated wind, and non-storm water discharges.
- Sequence work to minimize soil-disturbing activities during forecasted rain events.
- Limit disturbed soil area to the amount of acreage that can be protected prior to a forecasted rain event.
- Stabilize disturbed soil areas as soon as practical, and always prior to a forecasted rain event (See Section 4, Soil Erosion BMPs for soil stabilization methods).
- Protect environmentally sensitive areas, such as drainage channels, streams, and natural watercourses.
- When rain is forecast, adjust the construction schedule to implement soil stabilization and sediment controls on all disturbed areas prior to the onset of rain.

Maintenance and Inspection

- Review applicable scheduling and sequencing of construction activities throughout the project or activity to minimize the total area of exposed soil and the exposed soil exposure time.
- Inspect erosion and sediment controls prior to and after each storm event, and routinely throughout the construction and/or clean-up activity. If inspections warrant construction BMP changes, amend the schedule accordingly.

Pictures

Corresponding CASQA Fact Sheet

Fact Sheet EC-1

What

Silt fences are temporary linear sediment barriers made of permeable fabric that lets water through but prevents the majority of sediment from passing through. Silt fences also act by intercepting and slowing the flow of sediment-laden runoff and allowing sediment to settle from the runoff before water leaves the construction site.

When

- Silt fences are designed to intercept sheet flows to moderately concentrated flows.
- Generally, silt fences shall be used in conjunction with soil stabilization source controls up slope (see Section 4) to provide effective control, particularly for steep slopes, and slopes adjacent to water bodies or Environmentally Sensitive Areas (ESAs).
- Consider BMP 1-03 "Fiber Rolls" for minor slopes or perimeter sediment control on flat or slightly sloped areas.

Where

Silt fences are placed:

- Below the toe of exposed and erodible slopes.
- Down-slope of exposed soil areas.
- Around temporary stockpiles.
- Along streams and channels.
- Along the perimeter of a project.
- Consider BMP 1-03 "Fiber Rolls" for small stockpiles and perimeters of areas with shallow slopes.

How

- Construct silt fences with a setback of at least 3 feet from the toe of a slope in areas suitable for temporary ponding or deposition of sediment. Where a 3-foot setback is not practical, construct as far from the toe of the slope as practical.
- Construct the length of each reach (length of fence) so that the change in base elevation along the reach does not exceed one-third of the barrier height; each reach should not exceed 500 feet. The last 6 feet of the reach should be turned up slope.
- The maximum length of slope draining to the silt fence should be 200 feet or less.
- Excavate a trench approximately 6 inches wide and 6 inches deep to place the bottom of the silt fence into, ensuring that is not wider or deeper than necessary.
- Key-in, or bury the bottom of silt fence fabric in the trench and tamp into place. If it is not feasible to trench along the slope contour, use sand bags or backfilling to key in the bottom of the fabric.
- Install fence posts at least 12 inches below grade on the down slope side of trench.

IMPORTANT POINT

- **Silt fences should not be used to divert water. Silt fences should not be considered for installation below slopes steeper than 1:1 (vertical: horizontal) or that contain a high number of rocks or loose dirt clods unless the rocks are removed and erosion and soil stabilization controls (Section 4) are used up slope.**

Maintenance and Inspection

- Repair or replace split, torn, slumping, undercut or weathered fabric. Note that fabric may need to be replaced when installation is required for more than 5 to 8 months due to limited durability.

Maintenance and Inspection (cont.)

- Inspect silt fences prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Remove accumulated sediment when it reaches one third of the barrier height. Removed sediment shall be incorporated in the project at appropriate locations or disposed of in accordance with federal, state and local requirements.
- Silt fences that are damaged and become unsuitable for the intended purpose shall be removed and disposed of and replaced with new silt fence barriers or other applicable control.
- Remove silt fence when no longer needed and after up-gradient areas are permanently stabilized. Fill and compact post-holes and the anchor trench, remove sediment accumulation, and work the surface of the fence alignment to blend with adjacent ground.

Pictures

Silt fence installed with at least a 3 foot setback from the toe of an erodible slope. Note that use is combined with fiber rolls and serves as perimeter control.

Corresponding CASQA Fact Sheet

Fact Sheet SE-1

What A fiber roll (straw waddle) consists of straw, flax or other similar materials that are rolled and bound into a roll. The fiber roll lets water through but prevents the majority of sediment from passing through. Fiber rolls also act by intercepting and slowing the flow of sediment-laden runoff and allowing sediment to settle from the runoff before water leaves the construction site. In sensitive vegetation areas, only certified weed-free rice straw is to be used.

When Fiber rolls are used for sheet flow or where flows are slightly to moderately concentrated.

Where Fiber rolls are generally placed on the face of slopes at regular slope intervals to intercept runoff, reduce flow velocity, release the runoff as sheet flow and provide sediment removal.

- May be used along the top, face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- Fiber rolls are appropriate for perimeter site control or along streams, channels, storm drain inlets, or around stockpiles to intercept sediment-laden storm water and non-storm water runoff.

How Installation

- Locate fiber rolls on level contours spaced in accordance with the CGP requirements for LUP Type 2 & 3 and Risk Level 2 & 3 sites as follows:

Slope Grade	Spacing (sheet flow length not to exceed)
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

- In non-paved areas, stake fiber rolls into a trench that is the width of the roll and one-third the depth of the roll (2- to 4-inch deep trench).
- Drive stakes into fiber rolls at a minimum of 4-foot intervals.
- If more than one fiber roll is placed in a row, fiber rolls should be overlapped and not abutted together.

Removal

- When used in a permanent application, fiber rolls can be left in place.
  - Permanent fiber rolls are typically encased with a biodegradable material.
  - Note that removal can result in greater soil disturbance.
- When used for a temporary application as storm drain inlet protection or stockpile control for example, the fiber rolls should be removed at the completion of the construction cleanup activity in that area.
  - Temporary fiber rolls are typically encased with plastic netting that does not biodegrade.
  - Remove fiber rolls only when up gradient areas are stabilized and/or pollutant sources are no longer a hazard.

How (cont.)

- Remove fiber rolls before vegetation becomes too mature to avoid unnecessary soil and vegetation disturbance.
  - If fiber rolls are removed, collect and dispose of fiber roll and sediment accumulation as appropriate in accordance with federal, state and local requirements. Trapped sediment may be incorporated into the construction site. Fill and compact holes, trenches, depressions, or any other ground disturbance to blend with adjacent ground.
- Note that the cost of disposal of wet fiber rolls may be more expensive than dry fiber rolls.

Maintenance and Inspection

- Repair or replace spilt, torn, unraveling, or slumping fiber rolls.
- Inspect fiber rolls if rain is forecasted and perform maintenance as needed.
- Inspect fiber rolls prior to and after each rain event, and daily during extended rain events throughout the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Do not use fiber rolls containing polyacrylamindade or other flocculants. Use is considered "active treatment" and is subject to ATS requirements of the CGP (see BMP Detail 1-12).

Pictures

Fiber rolls as perimeter control.

Pictures (cont.)

Fiber roll installation on the face of a slope.

Corresponding CASQA Fact Sheet

Fact Sheet SE-5

What

A gravel bag berm consists of at least a single row of gravel bags that are installed end-to-end to form a barrier across a slope to intercept runoff.

When

Use gravel bag berms:

- When needed to reduce storm water flow velocity, release the runoff as sheet flow, and provide some sediment removal.
- Gravel bag berms can also be used when flows are moderately concentrated and when it is desirable to filter sediment in runoff. Gravel bag berms are generally more permeable than sand bags.

Where

- Ditches, swales, and storm drain inlets
- Gravel bag berms are also appropriate for perimeter site control or along streams, channels, storm drain inlets, or around stockpiles to intercept sediment laden storm water and non-storm water runoff.
- Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- Gravel bags may be implemented with other BMPs to maximize sediment containment.
- Sand bag barriers should be used in cases where it is desirable to block and pond flows (BMP 1-05 "Sand Bag Barrier").

How

- When used as a linear control for sediment removal:
  - Install along a level contour.
  - Turn ends of gravel bag row up slope to prevent flow around the ends.
  - Generally, gravel bag barriers are used in conjunction with temporary soil stabilization controls up slope to provide effective control.
- When used for concentrated flows:
  - Stack gravel bags to required height. When the height requires 3 rows or more, use a pyramid approach.
  - Upper rows of gravel bags shall overlap joints in lower rows.
- Construct gravel bag barriers with a setback of at least 3 feet from the toe of a slope. Where a 3-foot setback is not practical, construct as far from the toe of the slope as practical.

Maintenance and Inspection

- Perform routine inspections of gravel bag berms prior to and after each storm event, and daily during extended rain events throughout the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Reshape or replace gravel bags as needed.
- Repair washouts or other damage as needed. Note that bags may need to be replaced when installation is required for more than 6 months due to limited durability.
- Inspect gravel bag berms for sediment accumulations and remove sediment when accumulation reaches one-third of the berm height. Removed sediment shall be incorporated in the project at appropriate locations or disposed of in accordance with federal, state and local requirements.

Maintenance and Inspection (cont.)

- Remove gravel bag berms when no longer needed and when feasible, recycle gravel fill. Remove sediment accumulation, and clean, re-shape, and stabilize the area. Removed sediment shall be incorporated in the project at appropriate locations or disposed of in accordance with federal, state and local requirements.

Pictures

Gravel bags and fiber rolls used as perimeter sediment controls.

Gravel bags used as perimeter control.

Corresponding CASQA Fact Sheet

Fact Sheet SE-6

What

A sand bag barrier is a temporary linear sediment barrier consisting of at least one row high of sand bags placed end-to-end, designed to intercept and slow sediment-laden storm water and non-storm water runoff. Sand bag barriers allow sediment to settle from runoff before water leaves the construction site. Sand bag barriers tend to block and pond storm water flows.

When

- During construction or operation and maintenance activities in streambeds when the contributing drainage area is small.
- To capture and detain non-storm water flows.
- When site conditions or activity sequencing require adjustments or relocation of the barrier to meet changing field conditions and needs during construction.
- To temporarily close or continue broken, damaged or incomplete curbs.

Where

Sand bag barriers are used:

- To divert or direct flow away from disturbed slopes or create a temporary sediment basin.
- Where flows are moderately concentrated, such as ditches, swales, and storm drain inlets to divert and/or detain flows.
- Along the perimeter of a site, vehicle and equipment fueling and maintenance areas, chemical storage areas, or stockpiles.
- Below the toe or down slope of exposed and erodible slopes.
- Parallel to streams, channels, and roadways.
- Across channels to serve as a barrier for utility trenches or provide a temporary channel crossing for construction equipment, or to reduce stream impacts.
- Caution – do not use sand bag barriers in traffic areas or other areas where potential flooding is possible. Consider use of BMP 1-03 "Fiber Rolls" or BMP 1-04" Gravel Bag Berms."

How

- When used as a linear control for sediment removal:
  - Install along a level contour.
  - Turn ends of sand bag row up slope to prevent flow around the ends.
  - Generally, sand bag barriers shall be used in conjunction with temporary soil stabilization controls up slope to provide effective control.
- When used for concentrated flows:
  - Stack sand bags to required height. When the required height is three rows or more, use a pyramid approach. Upper rows of sand bags shall overlap joints in lower rows.
  - Construct sand bag barriers with a setback of at least 3 feet from the toe of a slope. Where a 3-foot setback is not practical, construct as far from the toe of the slope as practical.

Maintenance and Inspection

- Perform routine inspections of sand bag barriers prior to and after each storm event, and daily during extended rain events throughout the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP. Repair washouts or other damages as needed.
- Note that bags may need to be replaced when installation is required for more than 6 months due to limited durability.
- Inspect sand bag barriers for sediment accumulations and remove sediments when accumulation reaches one-third the barrier height.
- Remove sand bags when no longer needed and when feasible, recycle fill. Remove sediment accumulation, and clean, re-grade, and stabilize the area. Incorporate removed sediment at appropriate project locations or disposed of in accordance with federal, state and local requirements.

Pictures

Sand bags used as perimeter control.

Corresponding CASQA Fact Sheet

Fact Sheet SE-8

What

A BMP or a combination of BMPs used at storm drains or other drainage inlets to protect against the discharge of sediment-laden storm water and non-storm water runoff from construction or operational and maintenance activities. The BMP slows or ponds the storm water flow, giving the sediment time to settle out before discharge to the storm drain.

When

This BMP is required on all construction projects and operation and maintenance sites when sediment laden surface runoff may enter a storm drain inlet and/or drainage to watercourses. Do not construct when runoff will result in ponding into road traffic or onto erodible surfaces or slopes, or overflow onto the sidewalk.

Where

At downstream storm drain and/or drainage inlets that have the potential to be impacted by construction or “construction like” operation and maintenance activity, site storm water run-off, or non-storm water discharges.

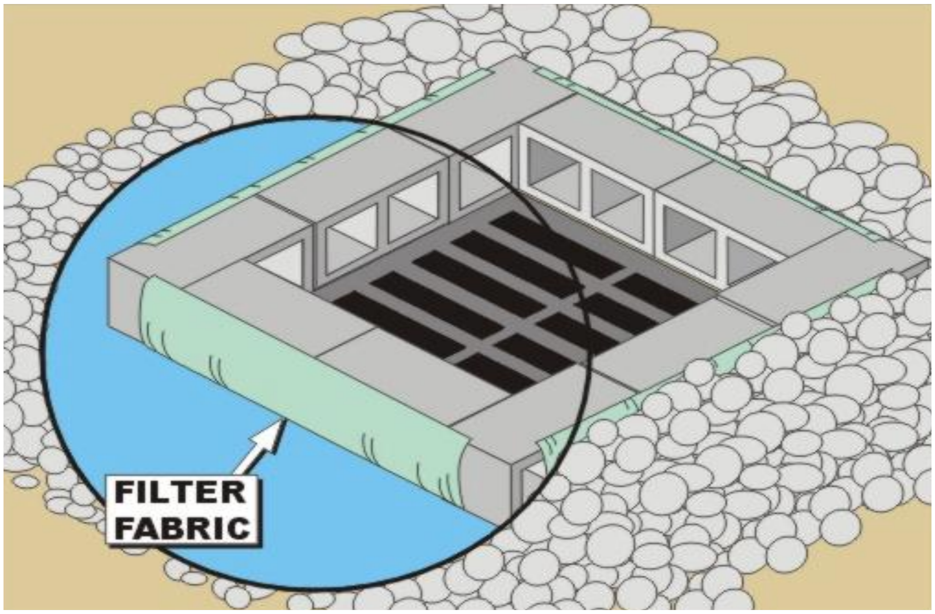
How

- Identify all downstream storm drain inlets or drainages that have the potential to receive runoff or non-storm water discharges from construction activities.
- Where a storm drain or drainage inlet is on or at the bottom of a slope, a series of small check dams (i.e., gravel bag berms) constructed at intervals along the slope may be required to slow the runoff. See BMP 1-11.
- Select appropriate protection and construct inlet protection based on the configuration of inlets at the site.
- Some municipalities require removal of BMPs from storm drains within 72 hours of a rain event (e.g., City of San Diego requires removal of inlet protection in the case that 0.25 inch or greater of rain is predicted). Consult with your project Field Environmental Representative for local requirements.
- Remove inlet protection devices at the end of the construction period, or when the inlet can no longer be impacted by the project or activity.

Maintenance and Inspection

- Perform routine inspections of BMPs prior to and after storm event, and daily during extended rain events throughout the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- During inspections:
  - Inspect bags, silt fence, or filter fabric for holes, gashes, and snags.
  - Check gravel bags for proper arrangement and displacement.
  - Remove the sediment behind the barrier when it reaches one-third of the barrier height. Removed sediment should be incorporated in the project or disposed of in accordance with federal, state and local requirements.

Pictures



Block and gravel-type inlet protection.

Inlet protection that blocks flow, preventing non-storm water discharges from entering drain.

Pictures (cont.)

Gravel bag inlet protection.

Inlet protection using fiber rolls and filter fabric.

Corresponding CASQA Fact Sheet

Fact Sheet SE-10

What Tracking controls consist of constructed/manufactured steel plates (rumble plates) or gravel. Tracking controls reduce offsite tracking of sediment and other pollutants by providing a stabilized entrance at defined soil disturbance activity site entrances and exits with materials that aid in removing sediment from vehicles, especially their tires or tracks. Controls can also consist of providing methods to clean-up sediment or other materials to prevent them from entering a storm drain, such as sweeping or vacuuming. Tracking controls can also include implementing tire washing.

When

- Stabilized entrances/exits should be implemented on each soil disturbance site having a defined entrance/exit consisting of soil which terminates into a paved roadway or substantial paved surface. Stabilized entrances/exits are in addition to other applicable BMPs.
- Daily sweeping or vacuuming should be implemented when sediment is tracked from the site onto public or private paved roads, typically at points of site exit.
- Install and implement tire washing when the above methods are not adequately controlling track-out.

Where Use stabilized entrances and/or sweeping (and tire washing, if needed) at construction and "construction like" operations and maintenance activity sites:

- where dirt or mud is tracked onto public roads;
- adjacent to water bodies;
- where poor soils are encountered, such as soils containing clay; and
- where dust is a problem during dry weather conditions.

How <u>Stabilized Entrances</u>

- Limit the points of entrance/exit to the construction or operations and maintenance site by designating combination or single purpose entrances and exits. Require all employees, subcontractors and others to use them. Limit speed of vehicles to control dust.
- Where feasible, grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment-trapping device before discharge (see BMP 1-10).
- Design stabilized entrance/exit to support heaviest vehicles and equipment.
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions.
- Use of constructed or constructed/manufactured steel plates with ribs for entrance/exit access is allowed.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 inches deep, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 inches but smaller than 6 inches shall be used.

<u>Street Sweeping and Vacuuming</u>

- Inspect potential sediment tracking locations routinely.
- Visible sediment tracking should be swept or vacuumed as needed. Manual sweeping is appropriate for small jobs.

How (cont.)

- For larger projects, it is preferred to use mechanical sweeping methods that collect removed sediment and material.
- If not mixed with debris or trash, incorporate the removed sediment back into the project or dispose of in accordance with federal, state and local requirements.

Tire Washing

- Design wash rack to support the heaviest traffic loads.
- Provide a turnout or doublewide exit to avoid traffic from entering through the tire washing area.
- Design a drainage ditch to route all rinse or wash waters from the tire washing area to a sediment trapping device (see BMP 1-10) to prevent any wash runoff from leaving the site.
- Hoses should be equipped with automatic shutoff nozzles.

Maintenance and Inspection

Stabilized Entrances

- Inspect routinely for damage and assess effectiveness. Remove sediment and repair if the stabilized entrance/exit is clogged with sediment.
- Perform routine inspections of BMPs, prior to and after storm events, and daily during extended rain events throughout the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the CGP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Where tracking has occurred on roadways, sweeping should be conducted the same day. Water should not be used to wash sediment off the streets, unless necessary. If water is used, it must be captured, preventing sediment-laden water from running off the street or site.
- Keep all temporary roadway ditches clear.

Street Sweeping and Vacuuming

- Inspect silt fences prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Inspect all site paved access roads daily and remove any sediment or other materials on the roads by vacuuming or sweeping daily, as needed, and prior to any rain event in accordance with the CGP Risk Levels 2 & 3 requirements.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- After sweeping is finished, properly dispose of sweeper wastes.

Tire Washing

- Inspect BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Inspect rack and/or sediment trap system routinely for damage and assess effectiveness. Remove accumulated sediment to maintain system performance.

Pictures

Manufactured metal plates knock dirt off vehicle tires before exiting a site.

Drive through wheel wash before exiting a site.

Corresponding CASQA Fact Sheet

Fact Sheets TC-1, TC-2, TC-3, and SE-7

What

Stockpile management consists of placing temporary BMPs, such as secured covers, over the piles, and/or placing berms, silt fences, fiber rolls, sand/gravel bags or straw bale barriers around the perimeter of stockpiles. Soil stabilizers/binders may also be used to augment stockpile management (BMP 4-05).

When

Use this BMP when construction projects or operation and maintenance activities require stockpiled soil, waste materials, and/or paving materials. Protection of stockpiles must be implemented whenever there is a potential for transport of materials by a water source or by wind.

- Construction and waste material stockpiles require protection from rain and wind at all times unless actively being used (protect during non-activity). Projects with SWPPPs require protection at the end of each day.

Where

Stockpiles at construction and "construction like" operation and maintenance activity sites, protecting against both run-on and run-off.

How

One or more of the following options may be used to manage stockpiles and prevent stockpile erosion and sediment discharges for storm water and non-storm water runoff/run-on.

 - Stockpile may be returned to the excavation if precipitation is forecast.
 - Sufficient BMP materials for temporary stockpile protection should be available onsite. Select cover materials or methods based on anticipated duration.
 - Protect stockpiles from storm water run-on and sediment runoff from the stockpiles using a temporary perimeter sediment barrier such as berms, silt fences, fiber rolls, sand/gravel bags, or straw bale barriers, as appropriate.
 - Cover stockpiles to prevent erosion. Note that the CGP requires that inactive stockpiles be covered. Where feasible, cover/protect stockpiles using a soil binder, according to BMP 4-05. Alternately, secure stockpiles with covers such as Visqueen weighted down with gravel bags, or sand bags. Plastic should be properly re-used or disposed of properly. Note the CGP discourages the use of plastic materials for cover when more sustainable alternatives can be used.
 - Stockpiles may be hauled off or temporarily stored in a protected location off site.

- Keep stockpiles organized and surrounding areas clean.
- Protect storm drain inlets, watercourses, and water bodies from stockpiles, as appropriate.
- Implement dust control practices as appropriate on all stockpiled material.

IMPORTANT POINT

- **Stockpiles should be covered, stabilized, or protected prior to the onset of precipitation.**

Maintenance and Inspection

- Repair and/or replace covers, and perimeter containment structures as needed.
- Inspect BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.

Pictures

Stockpile covered with plastic and secured with large rocks.

Silt fence used for stockpile perimeter control.

Corresponding CASQA Fact Sheet

Fact Sheet WM-3

What

Sediment basins are temporary basins formed by excavation or by constructing an embankment to temporarily detain sediment-laden runoff, allowing sediment to settle out before water leaves the site. The CGP specifies that sediment basins be designed per the CASQA fact sheet SE-2, therefore, this BMP provides general guidance and the CASQA handbook reference.

When

Sediment basins are appropriate:

- If sediment-laden water may enter a drainage system or watercourse.
- If areas are disturbed during the rainy season, in association with dikes, temporary channels, and pipes to convey runoff from disturbed areas.
- To construct before land disturbance, when feasible.
- In conjunction with erosion controls.

Where

Sediment basins are suitable on larger projects with sufficient space for the basin, and should be considered:

- Where maintenance is possible year-round.
- Within property limits, and where failure will not result in loss of life, building damage, or interruption of public roads or utilities.
- At the outlet of disturbed areas draining generally between 5 and 75 acres, evaluated on a site-specific basis.
- Where post-construction detention basins are required.

How

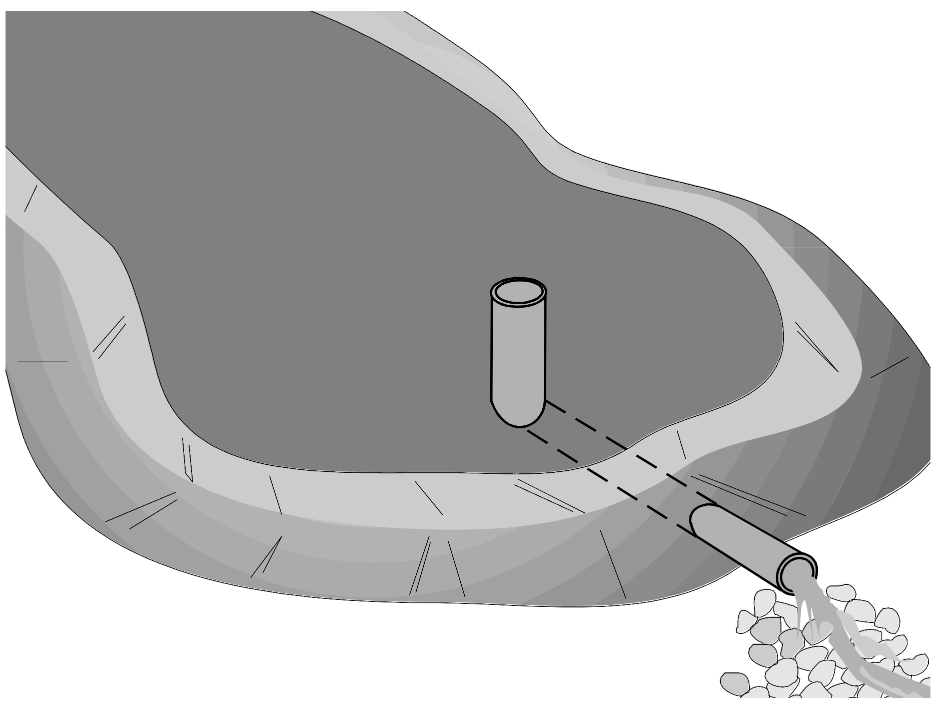
Design the sedimentation basin in accordance with CASQA fact sheet SE-2.

- In general, the basin depth must be no less than 3 feet, not including freeboard, which includes a sediment storage zone and a settling zone of at least 1 and 2 feet deep, respectively.
- Include features to accommodate overflow or bypass flows that exceed the design storm event.
- Utilize rock, vegetation, or other erosion control measures to protect the basin inlet, outlet, and slopes against erosion.
- Continuous fencing should be provided around the sedimentation basin to prevent unauthorized entry.

Maintenance and Inspection

- Inspect BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Inspect basin banks for seepage and structural soundness.
- Check inlet and outlet structures, spillway, and fencing for damage or obstructions. Repair damage and remove obstructions as needed.
- Remove accumulated sediment when it reaches 1/2 of the basin height or in accordance with the SWPPP requirements. Removed sediment shall be incorporated into the project appropriately or disposed of in accordance with federal, state and local requirements.
- Remove accumulation of any vegetation during every inspection.
- Remove standing water from the basin within 72 hours after accumulation to prevent the production of mosquitoes.
- Completely remove basin when no longer needed. Remove sediment accumulation. Fill and compact excavation, any fencing post-holes and anchor trench, and blend the surface with the adjacent ground.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet SE-2

What Sediment traps are small, temporary containment areas where sediment-laden runoff is detained, allowing sediment to settle from the runoff before water leaves the site. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area, and usually have a gravel outlet. Sediment traps only remove large and medium-sized soil particles and require upstream erosion control.

When Sediment traps are appropriate:

- If the drainage area is less than 5 acres.
- If sediment-laden water may enter a drainage system or watercourse.
- Construction or operation and maintenance activity occurs in small drainage areas with no unusual drainage features, and short-duration construction activities.
- To construct before land disturbance, when feasible.
- In conjunction with upstream erosion controls.

Where Sediment traps are suitable on sites with sufficient space to allow for infiltration and sediment settling, and should be considered:

- Outside the area being graded, but as near as practical to sediment producing areas, with access for maintenance.
- At the perimeter of a site, at one or more locations where sediment-laden runoff is discharged offsite, to a storm drain or watercourse.
- Around or upslope from storm drain inlet protection measures.
- Within property limits and where failure will not result in loss of life, building damage, or interruption of public roads or utilities.

IMPORTANT POINT

- **Should not be located in streams unless properly permitted with regulatory agencies. Consult with the Field Environmental Representative.**

How

- Design the sediment trap per referenced engineering standards or local grading ordinance.
- Trap side slopes should be 1:3 (vertical: horizontal) or flatter.
- Trap should be sized to accommodate a settling zone and sediment storage zone with recommended minimum volumes of 67 yd^3/acre and 33 yd^3/acre of contributing drainage area, respectively, based on 0.5 inch of runoff volume over 24 hours. Larger or multiple traps may be required to accommodate specific rainfall, soil, or site conditions.
- Traps with an impounding levee greater than 4.5 feet tall, measured from the lowest point of the impounding to the highest point of the levee, and traps capable of impounding more than 35,000 ft^3, should be designed by a California Registered Civil Engineer.
- The outlet pipe or open spillway must be designed to convey anticipated peak flows.
- When an earth or stone outlet is used, the outlet crest elevation should be at least 1 foot below the top of embankment.
- When a crushed stone outlet is used, the crushed stone or gravel should meet AASHTO M43, size No. 2 or 24, or its equivalent.

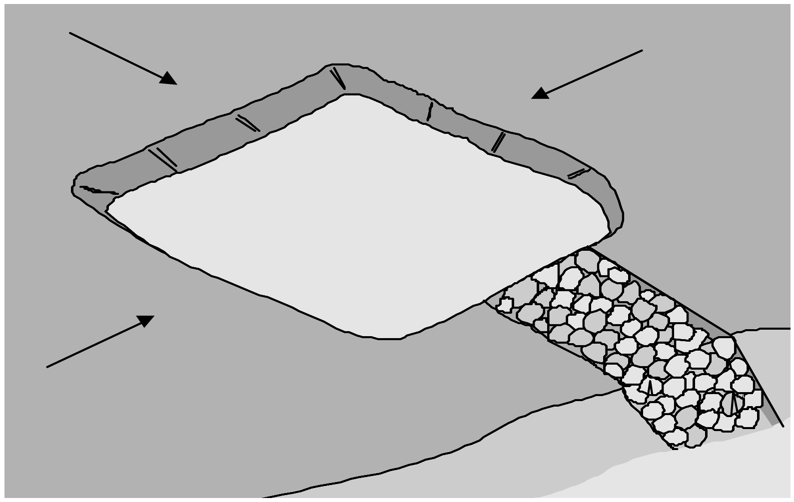
How (cont.)

- Clear any vegetation under the embankment and pool area.
- The compacted embankment fill material must be free of roots, vegetation, oversize, or other objectionable material.
- When a riser is used, all pipe joints must be watertight, and at least the top 2/3 of the riser should be perforated with 0.5-inch diameter holes spaced 8 inches vertically and 10 to 12 inches horizontally.
- Utilize rock, vegetation, or other erosion control measures to protect the trap outlets against erosion.
- Fencing should be provided around the trap to prevent unauthorized entry.

Maintenance and Inspection

- Inspect BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Inspect trap banks for seepage and structural soundness.
- Inspect outlet structures, spillway, and fencing for any erosion, damage, or obstructions. Repair damage and remove obstructions as needed.
- Remove accumulated sediment when it reaches one third of the trap capacity. Removed sediment shall be incorporated in the project appropriately or disposed of in accordance with federal, state and local requirements.
- Remove accumulation of any vegetation during every inspection.
- Water suitable for mosquito production may stand in the sediment trap, particularly if subjected to daily non-storm water flows. Remove standing water from the trap 72 hours after accumulation.
- Remove trap when no longer needed. Remove sediment accumulation, fill and compact excavation, any fencing post-holes, and blend the surface with adjacent ground.
- BMPs that require dewatering shall be continuously attended during dewatering. Dewatering BMPs shall be implemented at all times during such activities.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet SE-3

What

Check dams are small barriers constructed of rock, logs, gravel bags, sandbags, fiber rolls, or other suitable materials, placed across a swale or drainage ditch. Check dams create small pools and reduce the effective slope of the channel, reducing scour and erosion by reducing flow velocity and increasing residence time within the channel. Check dams promote sediment trapping.

When

Check dams are appropriate:

- If sedimentation should be promoted behind the dam.
- If erosion protection is desired in small intermittent channels and temporary swales.
- During the establishment of grass linings in drainage ditches or channels.
- If grade control is desired or required.

Where

Check dams should be considered:

- In small open channels that drain 10 acres or less.
- In channels to reduce slope and storm water runoff velocities.
- In temporary ditches where the short length of service does not warrant establishment of erosion-resistant lining.

IMPORTANT POINT

Check dams should not be used:

- **In streams or in channels with flow between storm events.**
- In channels that are already grass-lined, unless erosion potential or sediment-laden flow is expected. Installation of check dams may damage vegetation.

How

- Do not construct check dams with straw bales or silt fence, since concentrated flows quickly wash out these materials.
- Check dams reduce the capacity of the ditch or swale. Alternative BMPs or an increased swale or ditch size may be necessary or the size of the ditch or swale may need to be increased to prevent overtopping.
- Maximum slope and velocity reduction is achieved when the toe of the upstream dam is at the same elevation as the top of the downstream dam. The center section of the dam should be lower than the edge sections (at least 6 inches), acting as a spillway, so that the check dam will direct flows to the center of the ditch or swale.
- The check dam should be installed along a level contour and should completely span the ditch or swale to prevent washout.
- Install the first check dam approximately 16 feet from the outfall device and at regular intervals based on slope gradient and type.
- Check dams should be placed at a distance and height to allow small pools to form between each check dam.
- For multiple check dam installation, backwater from a downstream check dam should reach the toe of the upstream check dam.
- High flows (typically a 2-year storm or larger) should safely flow over the check dam without an increase in upstream flooding or damage to the check dam.

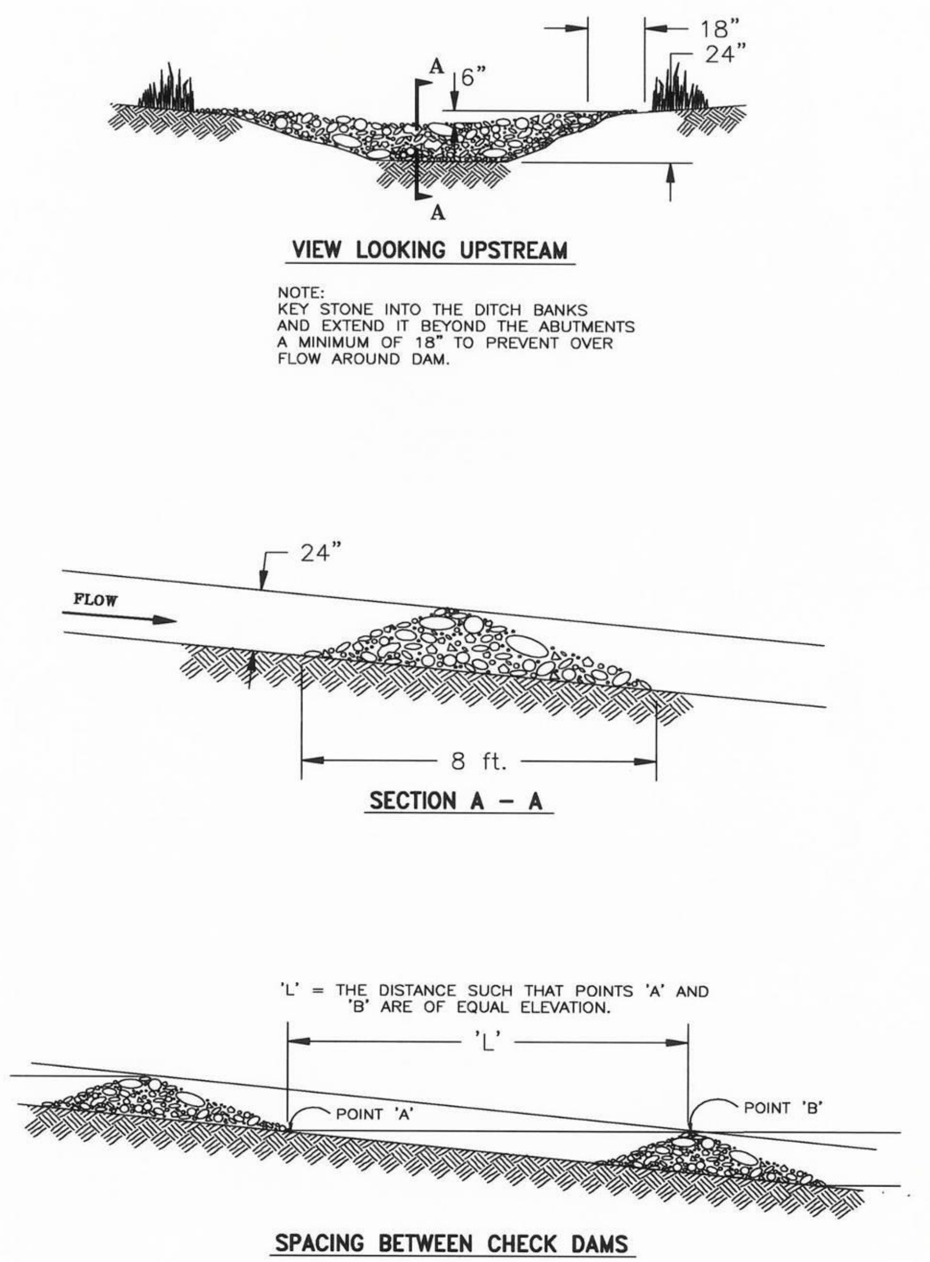
How (cont.)

- Rock check dams are usually constructed of 8 to 12 inch rock placed individually by hand or mechanically, but never dumped. The rock used should be large enough to stay in place given the expected channel flow. Abutments should be extended 18 inches into the channel bank. Rock can be graded such that smaller diameter rock (2 to 4 inches) is located on the upstream side of larger rock, increasing residence time.
- Log check dams are usually constructed of 4 to 6 inch diameter logs installed vertically, and embedded at least 18 inches into the soil, and can be bolted or wired.
- See BMP 1-03 for installation of fiber roll check dams. Fiber rolls should be trenched in, backfilled, and firmly staked.
- Gravel bag and sand bag check dams are constructed by stacking bags across the ditch or swale. Gravel bags and sand bags used to construct check dams should conform to the requirements of BMP 1-04 and 1-05, respectively. Tightly abut bags and stack in a pyramid fashion no higher than 3 feet. Upper rows shall overlap joints in lower rows.
- Manufactured products used to construct check dams should be installed in accordance with the manufacturer's instructions, and typically requires trenching or anchoring.
- If grass is planted to stabilize the ditch or swale, the check dam should be removed when the grass has matured, unless the slope of the swale is greater than 4 percent.

Maintenance and Inspection

- Check dams require extensive maintenance following high-velocity flows.
- Inspect BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Replace missing, damaged, or degraded rock, bags, rolls, etc.
- If the check dam is used as a grade control structure, sediment removal is not required as long as the system continues to control the grade.
- Sediment can be re-suspended during subsequent storms or removal of the check dam. Remove accumulated sediment when it reaches 1/3 of the barrier height, and prior to permanent seeding or soil stabilization. Removed sediment shall be incorporated in the project at appropriate locations or disposed of in accordance with federal, state and local requirements.
- Water suitable for mosquito production may stand behind check dams, particularly if subjected to daily non-storm water flows. Remove standing water from the dam 72 hours after accumulation.
- Remove check dam and accumulated sediment when no longer needed.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet SE-4

What

Active Treatment Systems (ATS) reduce turbidity of runoff by introducing chemicals to storm water through direct dosing or an electrical current to enhance flocculation, coagulation, and sediment settling. Coagulants and flocculants include inorganic salts and polymers which enhance sediment settling and removal and reduce turbidity. The CGP has specific requirements for ATS. Only general guidance for ATS is provided in this BMP; additional details are provided in the CASQA Handbook.

Limitations:

IMPORTANT POINT

- **Specific permit requirements or mitigation measures such as RWQCB 401 Certification, U.S. Army Corps of Engineers 404 permit, and approval by the California Department of Fish and Game supersede the guidance in this BMP.**
- If numerical water quality standards are mentioned in any permits, testing and sampling may be required. Streams listed as 303(d) impaired for sediment, silt, or turbidity, are required to conduct sampling to verify that there is no net increase in sediment load due to construction activities.

When

ATS should be used when a rigorous combination of drainage control, erosion control, and sediment control BMPs are not effective or are not anticipated to be effective based on site soil types (e.g., fine grained or highly erosive soils), proximity to sediment-sensitive receiving waters, and/or other site constraints. Phasing and limiting active areas of disturbance should be considered prior to use of an ATS.

Where

ATS should be considered where turbid discharges to sediment and turbidity sensitive waters cannot be avoided using traditional BMPs.

How

IMPORTANT POINT

- **ATS should be implemented in accordance with the guidance provided in the CASQA Handbook.**
- **Dischargers choosing to utilize chemical treatment in ATS must also follow all guidelines of the CGP Attachment F – Active Treatment System Requirements.**

Maintenance and Inspection

- ATS must be operated and maintained by experienced personnel meeting CGP training requirements at all times during treatment operations. Visual monitoring for proper performance shall be performed daily and recorded in a data log. The project data log shall include the name, phone number, and training documentation of the person responsible for operating and monitoring ATS.
- Requirements for ATS shall include but are not limited to operational and compliance monitoring, toxicity monitoring for batch and flow-through treatments, numeric effluent limit compliance, operator training, implementation of standard BMPs, and proper sediment removal and disposal.

Pictures

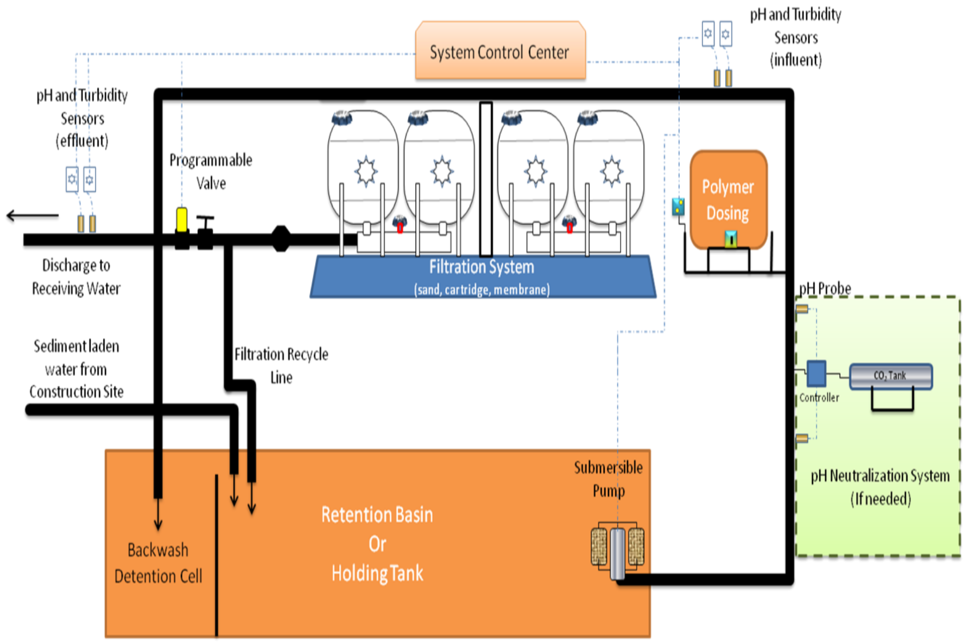
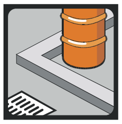


Figure has been adapted from Port of Seattle response to Washington Dept. of Ecology Action Order 2948

Corresponding CASQA Fact Sheet

Fact Sheet SE-11



Section 2 – Waste Management and Material Controls

Why Are Waste Management and Material Controls Required?

Federal, state and local laws, regulations, ordinances and permits prohibit the discharge of contaminated storm water to storm drains, drainages, and surface waters. Pollutants such as litter, paint, solvents, fuel, lubricants and demolition wastes, can be transported by runoff from a construction site. These BMPs address pollutants associated with material use and waste management to ensure that all pollutants are properly managed and are not discharged to storm drains, drainages, and surface waters.

What are Waste Management and Material Controls?

Waste Management and Materials Controls are source control BMPs that reduce or prevent contact between wastes and/or materials and storm water. Waste Management and Materials Controls presented in this Manual include the following:

- BMP 2-01 Material Delivery and Storage
- BMP 2-02 Material Use
- BMP 2-03 Spill Control
- BMP 2-04 Solid Waste Management
- BMP 2-05 Hazardous Materials/Waste Management
- BMP 2-06 Contaminated Soil Management
- BMP 2-07 Sanitary/Septic Waste Management
- BMP 2-08 Liquid Waste/Drilling Fluid Management

What

Material Delivery and Storage Controls are procedural BMPs controlling the delivery and storage of construction materials, supplies and wastes so that storm water run-on and run-off and non-storm water discharges do not contact the material or wastes.

When

This BMP is applicable when it is necessary to store materials at a construction or operations and maintenance site, and does not apply to materials and supplies stored on trucks that are driven on site and off site daily.

Where

All construction or operations and maintenance activity sites where construction material is delivered or stored and has the potential to be contacted by storm water.

How

Use the following BMP measures as appropriate:

- Only store the minimum amount of material that is needed for the job.
- Locate storage areas away from storm drain inlets, drainage systems, and watercourses to prevent storm water run-on from reaching the materials.
- If practical, store materials in enclosed storage containers such as cargo containers.
- Store materials on impervious surfaces or use plastic groundcovers and berms on bare soil to prevent spills or leakage from contaminating the ground.
- For known hazardous materials, keep materials covered using plastic or other waterproof materials.
- Store chemicals in water tight containers with appropriate secondary containment systems or in a storage shed to prevent contaminated run-off/run-on from leaving storage areas.
- Keep an adequate supply of spill kit materials nearby.
- Ensure that qualified personnel are available when hazardous materials are delivered to ensure proper delivery and storage in a designated area.
- Material Safety Data Sheets (MSDS) should be made available on-site for all materials stored that have the potential to come in contact with storm water.
- When a storage area is no longer needed, return it to original condition.
- Bagged materials such as cold patch, concrete mix, and other materials with the potential to pollute runoff should be placed on pallets and covered during non-working days and prior to and during rain events.

Maintenance and Inspection

- Repair or replace covers, containment structures, or perimeter controls as needed to ensure proper function.
- Perform Routine BMP inspections of labels on containers and designated delivery and storage areas.
- Inspect BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.

Pictures

Materials are covered and neatly stored within a curbed area.

Corresponding CASQA Fact Sheet

Fact Sheet WM-1

What Material Use is a procedural BMP that controls the amount or use of materials, chemicals and/or hazardous substances stored onsite and minimizes their potential for contact with storm water run-on or runoff or by non-storm water discharges.

When Apply the Material Use BMP when the following materials are used or prepared on site:

- Pesticides (herbicides, insecticides, and biocides).
- Fertilizers and soil amendments.
- Detergents.
- Petroleum products such as fuel, oil, and grease.
- Asphalt and other concrete components.
- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds.
- Mastic, pipe wrap, primers, and paint.
- Concrete compounds.
- Welding material.
- Other materials that may be detrimental if released to the environment.

Where All construction and operations and maintenance activity sites that utilize the above materials.

How

- Only use products or materials onsite that have been approved through the SDG&E Product Approval process.
- Reduce or eliminate use of hazardous materials on site when practical. Contact your Field Environmental Representative for additional information.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Thoroughly dry empty latex paint cans, used brushes, paint rags, absorbent materials, and drop cloths. These dry wastes may be disposed of with other construction debris.
- When possible, mix paint indoors, otherwise use secondary containment structures. Do not clean paintbrushes or rinse paint containers into a street, gutter, storm drain, sanitary sewer or watercourse.
- Dispose of any paint thinners, residue, and sludge that cannot be recycled as hazardous waste (see BMP 2-05). For water-based paint, clean brushes to the extent practical, and rinse into a concrete washout pit or temporary sediment trap. Do not allow liquid to discharge to a storm water conveyance system. For oil-based paints, clean brushes to the extent practical and filter and reuse thinners and solvents.
- If possible, recycle residual paints, solvents, non-treated lumber, and other materials.

IMPORTANT POINT

- **Do not over-apply fertilizers, pesticides, and soil amendments. Prepare only the amount needed. Strictly follow the recommended usage instructions.**

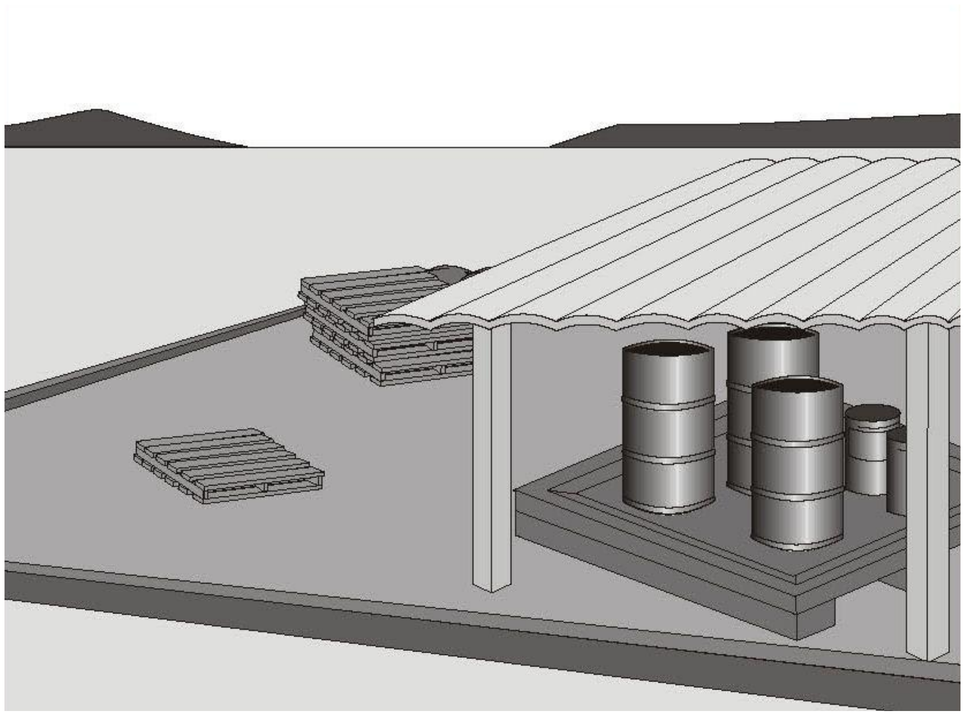
How (cont.)

- For termiticide applications (termite control pesticide) refer to CASQA Fact Sheet WM-2 "Material Use." Note that termiticide can only be applied when it is done in accordance with all applicable federal, state and local labeling requirements and in no case shall it be applied in a manner that would result in either a direct or indirect (e.g., drift) discharge to waters of the US or state.
- Keep an ample supply of spill cleanup material near use areas. Instruct employees in spill cleanup procedures.

Maintenance and Inspection

- Spot-check employees and contractors regularly throughout the job's duration to ensure appropriate practices are being employed.
- Inspect BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable).

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet WM-2

What Spill Control is a procedural BMP used to control, contain, and clean-up spills on site so that storm water run-on and runoff and non-storm water discharges do not become contaminated.

When This BMP applies to all personnel present at construction and operations and maintenance activity sites at all times. Spill control procedures are implemented anytime chemicals (liquid or solid form) and/or hazardous materials and/or wastes are handled, used or stored. A single handling, use, or storage of a hazardous material or waste is sufficient to trigger this requirement. Such substances may include, but are not limited to fuels, lubricants, solvents, fertilizers, pesticides, herbicides, soil binders, coolants, paints, and sewage.

To the extent that work can be accomplished safely, spills of materials or chemicals shall be contained and cleaned up immediately.

Where All construction and operations and maintenance activity sites where chemicals and/or hazardous materials and/or wastes are handled, used, or stored.

How

- Install and maintain spill control and cleanup kits in areas where any chemicals and/or hazardous materials and/or waste are handled, used and/or stored.
- Construction Supervisor, Crew Foreman, or Facility Supervisor and sufficient onsite personnel should be trained in spill control to address potential spills on the site.
- Only staff trained on spill response procedure should be used to control spill.
- If the spill is a threat to life or the environment, or other emergency situation where emergency medical support, fire department response, or outside assistance is needed, ***immediately*** call the **911** Operator and the local emergency response agency (usually the local fire department). Then, promptly call **Service Dispatch (Trouble) @ (619) 725-5100** and your supervisor.
- For all spills ***immediately*** notify the acivity and site supervisor ***and***/or the Field Environmental Representative and describe the spill and current situation. The Field Environmental Representative will make any required regulatory agency notifications per Environmental Standard (ES) G7841 and the Company's Release Reporting Scenario Guidance available on the Environmental Services Department website.
- If possible, and if you have proper training and personal protective equipment, stop the flow of the spill. If it can be done safely, contain the spill to a confined area. Containment may be able to be accomplished with:
    - Earthen berms
    - Sand bags
    - Absorbent booms
    - Absorbent socks

  Containment material on site as part of the Spill Kit should reflect site characteristics. For guidance, request assistance from the Field Environmental Representative.
- To the extent that it doesn't compromise cleanup activities, spills shall be covered and protected from storm water run-on/-off during rain events.

How (cont.)

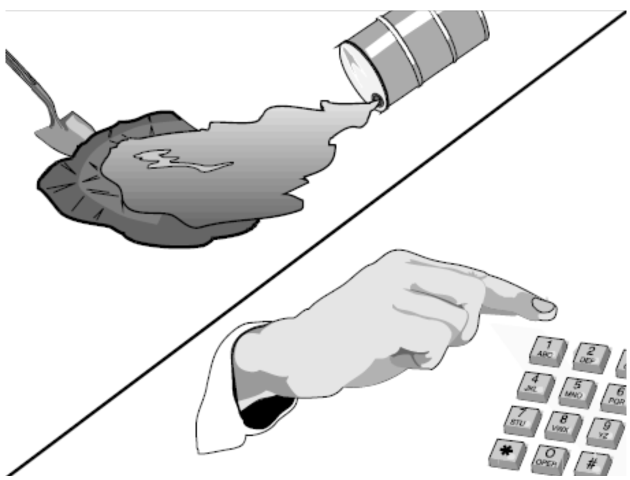
- Immediately clean the impacted area, and properly dispose of any impacted materials.
  - Spills shall not be buried, except as necessary for immediate interim containment purposes. Spilled material and impacted burial material must be removed as soon as possible after proper control and containment and properly disposed of.
  - Use absorbent materials on spills to thoroughly clean up the material to the maximum extent possible. Spills shall not be diluted with water or other liquid for purposes of mitigating the spill (the solution to pollution is not dilution). When it is necessary to use water or other liquid for final cleaning and decontamination of a spill, the water or other liquid shall not be allowed to enter storm drain inlets, drainages, or watercourses, and shall be collected and disposed of properly. Coordinate disposal of these wastes with the Field Environmental Representative.

    Used clean up materials, contaminated materials, and recovered spill material shall be stored and disposed of in accordance with federal, state and local regulations and BMP 2-05 "Hazardous Materials/Waste Management."

Maintenance and Inspection

- Perform routine inspections to verify that spill control clean-up materials are located near material storage, unloading, and use areas prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable).

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet WM-4

What

Solid Waste Management is a procedural BMP used to minimize site non-hazardous solid waste generation, and control the contact of site non-hazardous solid waste with storm water or non-storm water runoff.

Examples of potential solid wastes requiring management control BMPs include, but are not limited to:

- Concrete, cement, asphalt rubble, masonry brick/block.
- Vegetation debris, general trash, and materials used to transport and package construction materials.
- Steel and scrap metals, pipe, electrical cuttings and equipment parts.
- Hazardous Materials/Waste Management is covered in BMP 2-05.

When

During all phases of construction or operations and maintenance activities

Where

These BMPs should be used on all construction projects and operations and maintenance activities that generate solid waste.

How

- Practice good housekeeping and keep site clean.
- Use dry methods for site cleanup such as sweeping, vacuuming and hand pick-up.
- Designate a waste storage area on site. If a designated waste storage area is not feasible, remove wastes from the site regularly.
- Prohibit littering by employees, contractors and visitors.
- Trash receptacles with lids or weatherproof covers should be available on site and/or on construction vehicles.
- Cover or close lids of all waste containers at the end of each day and prior to rain.
- Protect wastes from being washed away by rain, storm water run-on, or other waters (irrigation, water line breaks, etc.).
- To prevent storm water run-on from contacting stored solid waste (stockpiled materials) use berms, secondary containment, covered dumpsters/roll-offs or other temporary diversion structure or measures (BMP 1-08 "Stockpile Management").
- For materials with the potential for spills or leaks, stockpile the material on impervious surfaces or on plastic groundcovers to prevent spills or leaks infiltrating the ground.
- Do not hose out or clean out dumpsters or containers at the construction site.
- Prevent solid waste and trash from entering and clogging storm drain inlets.
- As practical, incorporate any removed clean sediment and soil back into the project.

Maintenance and Inspection

- Collect site trash regularly, especially before rainy or windy conditions. Perform routine inspections of site, including storage areas, dumpsters, stockpiles and other areas where trash and debris are collected prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable).Close trash can lids and dumpster covers at the end of each day and before rainy or windy conditions.

Corresponding CASQA Fact Sheet

Fact Sheet WM-5

What

Hazardous Materials/Waste Management is a procedural BMP for the use, control, containment, and disposal of hazardous materials and waste. This BMP is to be used in conjunction with SDG&E Environmental Standard (ES) G 8724 Hazardous Materials/Waste Management.

Examples of potential hazardous materials and waste requiring management control BMPs may include, but are not limited to:

- Petroleum products such as oil, fuel, grease, cold mix, and tar.
- Glues, adhesives, and solvents.
- Herbicides, pesticides, and fertilizers.
- Paints, stains, and curing compounds.
- Other hazardous or toxic substances.

When

Use this BMP during all phases of construction or operations and maintenance activity when the activity involves the storage and use of hazardous materials, or the generation of hazardous waste byproducts.

Where

All applicable construction and operations and maintenance activity sites where hazardous materials are used and/or hazardous waste is generated. A single instance of handling, use, or storage of a hazardous material or waste is sufficient to trigger this requirement.

How

Hazardous materials and hazardous wastes shall be managed in accordance with the following procedures:

- Only use products or materials onsite that have been approved through the SDG&E Product Approval process.
- Minimize the amount of hazardous materials stored at the site and the production and generation of hazardous waste at the site.
- Cover or containerize and protect from vandalism and exposure any hazardous materials and hazardous wastes.
- Clearly mark all hazardous materials and hazardous waste containers per the ES. Place hazardous waste containers in watertight storage sheds for hazardous waste containers. Alternately, use secondary containment systems, but watertight storage sheds are preferred when hazardous waste containers are stored at the construction site.
- Hazardous materials and hazardous waste containers must meet DOT type and specifications per the ES. The containers must be closed (hand tightened) during activity hours and securely tightened during non-activity hours.
- Stockpiled cold mix should be placed on and covered with plastic.
- Mixing of waste materials is strictly prohibited.
- Storm water that collects within secondary containment structures must be inspected prior to being discharged to ensure no pollutants, oil sheens or non-stormwater discharges are present.
- Spills cannot be discharged to the environment from secondary containment (see BMP 2-03 "Spill Control").

How (cont.)

- All secondary containment systems for hazardous materials or hazardous wastes must be able to hold the volume of the largest container in the storage area and, if uncovered, sufficient additional capacity for storm events. A general rule of thumb for Southern California is that the additional containment volume for an anticipated rain event can be approximated by adding at least an additional four inches (a 4-inch rain) to the height of the containment sized for the entire waste volume of the largest container (Based on the Los Angeles Area 10 year, 24 hour precipitation frequency and a 24-hour manned facility). However, even within Southern California, this varies by the geographic region precipitation frequency and the hours of operation of the facility (containment inspection frequency). Consult with your Field Environmental Representative for determining the minimum volume required for the specific situation and geographical location.
- Hazardous waste must be segregated from other solid waste and stored and disposed of properly according to the ES. **Only company approved vendors with current contracts in place will be used to manage or dispose of hazardous wastes.**

IMPORTANT POINT

- In addition to following this BMP and ES G8724, employees or contractors are responsible for compliance with federal, state, and local laws and regulations regarding storage, handling, transportation, and disposal of hazardous waste.

Maintenance and Inspection

- Routinely inspect the covers on hazardous material storage areas for tears or flaws and repair as necessary. Drums and drum storage areas are to be inspected at least weekly and the results recorded on an inspection log.
- All secondary containment systems for hazardous materials or hazardous wastes must be able to hold the volume of the largest container in the storage area and, if uncovered, sufficient additional capacity for storm events. A general rule of thumb for Southern California is that the additional containment volume for an anticipated rain event can be approximated by adding at least an additional four inches (a 4-inch rain) to the height of the containment sized for the entire waste volume of the largest container. Check with your Field Environmental Representative in the event you are unsure whether sufficient secondary containment exists for any facility.
- Inspect BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable) to ensure that no hazardous materials or waste are improperly left exposed to storm water. Immediately initiate repairs related to a storm event and no later than within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event.

Corresponding CASQA Fact Sheet

Fact Sheet WM-6

What

Contaminated Soil Management is a procedural BMP for the control of contaminated soils, or soils suspected of being contaminated, that are encountered during site activities. Importation of fill shall also be managed in accordance with G8755 Import Fill Materials for Large Projects (>100 Cubic Yards), Projects within Coastal Zone, and Environmentally Sensitive Areas.

When

This contaminated soil management BMP should be used whenever soil is imported for fill, soil contamination is suspected, or when contaminated soil is encountered during construction or operation and maintenance "construction like" activities. Construction crews should be vigilant when projects are located in highly urbanized or industrial areas or in highway or roadway right-of-ways.

Where

All construction or "construction like" activity sites, but especially construction and operation and maintenance sites in urbanized or industrial areas where soil contamination may have occurred because of spills, illicit discharges, and leaks from underground storage tanks. Contaminated soils may also be encountered during digging and trenching activities on highway and roadway right-of-ways.

How

Contaminated soil (including soil import that may be contaminated) should be managed in accordance with the following procedures:

- Identify contaminated soil by looking for the following:
  - Soil that is discolored, black, gray, white; or
  - Soil that has an unusual odor, such as, petroleum, acid, alkaline, sewage, solvent, or any other chemical smell.
- If any potentially contaminated soil is detected, immediately discontinue the activity and contact the project's Field Environmental Representative.
- The CGP requires that the discharger sample and test contaminated soils to ensure proper handling and notify the appropriate local, State and federal agencies, as well as the appropriate Regional Water Board if there is a reportable release event. A reportable release is a discharge or release of oil, hazardous materials or wastes, hazardous substances or chemicals in quantities that may be harmful to the public health. This includes non-stormwater discharges of any kind into the stormwater conveyance system.
- Contaminated soils must also be managed properly per SDG&E Environmental Standards (ES). See ES G8729; G8724; and G8755.

Maintenance and Inspection

- Inspect all imported fill for contamination per Environmental Standard G8755.
- Perform routine inspections of digging and trenching operations during construction and operation and maintenance activities looking for contaminated soils in addition to normal BMP inspections prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Immediately initiate repairs related to a storm event no later than within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- All contaminated soils must be managed properly in accordance with applicable federal, state, and local laws and regulations.

Corresponding CASQA Fact Sheet

Fact Sheet WM-7

What Sanitary/Septic Waste Management is a procedural BMP for the control of sanitary/septic wastes. Sanitary/Septic waste is domestic (human) waste.

When When construction or operation and maintenance site location requires onsite sanitary/septic waste portable toilets, or hand wash/rinse stations, or shower units.

Where All applicable construction and field operations and maintenance sites.

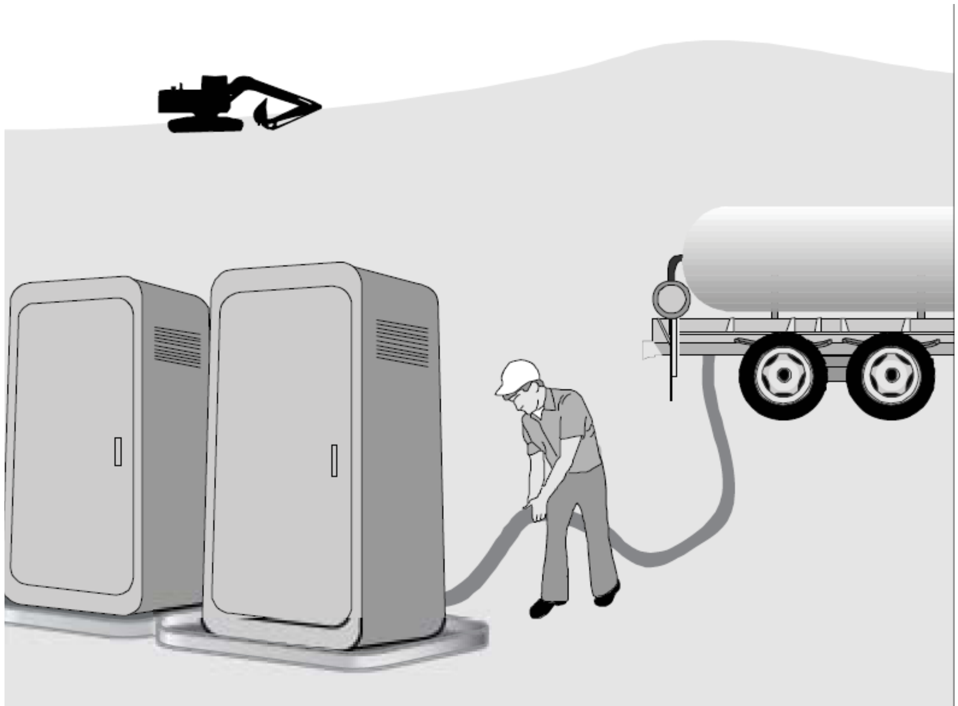
How Sanitary/septic wastes shall be managed in accordance with the following procedures:

- Incorporate into regular safety meetings the education of employees, contractors, and suppliers on:
  - Potential dangers to humans and the environment from contact with sanitary/septic wastes due to bacteria, viruses, and parasites.
  - Approved sanitary/septic waste storage and disposal procedures.
- Use only reputable, licensed sanitary/septic waste facility providers and haulers for sanitary facilities (portable toilets, hand wash stations, shower units) and their transportation to and from the construction site.
- Ensure that sanitary facilities are equipped with secondary containment to prevent discharge of pollutants to the storm water drainage system or receiving water.
- Sanitary facilities should be located away from drainage systems and watercourses, minimizing the likelihood of leaks or spills contaminating waterways.
- Sanitary facilities should be located away from highways and roadways to avoid vehicles colliding with the sanitary units.
- When subjected to high winds, risk of high winds, or risk of vandalism, sanitary facilities shall be secured to prevent overturning.
- Sanitary wastewater should not be buried or discharged, except to a properly permitted sanitary sewer discharge facility. A permit may be required from the local Sanitation District.
- Temporary sanitary facility's holding tanks shall be emptied by a licensed waste hauler prior to transport.

Maintenance and Inspection

- Perform inspections of sanitary facilities and BMPs routinely prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Ensure that sanitary/septic facilities are maintained in good working order and routinely serviced by a licensed service.
- When servicing of portable sanitary facilities is conducted, wash/rinse water shall, not be allowed to runoff and shall be collected and disposed of properly in accordance with federal, state, and local requirements.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet WM-9

What

Non-hazardous Liquid Waste/Drilling Fluid Management is a procedural BMP for managing non-hazardous liquid wastes on a construction or operation/maintenance activity site.

Hazardous liquid wastes, including water with an oily sheen, should be managed using BMP 2-05 "Hazardous Materials/Waste Management."

Dewatering operations, and concrete slurry residue should be managed according to BMP 3-01, and BMP 3-05, respectively.

Non-hazardous Liquid wastes include, but are not limited to:

- Drilling slurries/muds and fluids, and waste water and rinse water without an oil sheen (including pressure washing).
- Dredging spoil, and non-storm water liquid discharges that do not have discharge permits.

When

Liquid waste management is applicable when construction projects and operations and maintenance activities generate any non-hazardous liquid byproducts, residuals,, or wastes.

Where

All applicable construction and operations and maintenance sites where non-hazardous liquid waste is present.

How

- Vehicle and equipment cleaning using water is discouraged on site. If washing is required for safety or for the work, utilize BMP 3-03 "Vehicle and Equipment Washing."
- Drilling residue and drilling fluids should be disposed of in accordance with federal, state and local requirements. Coordinate the disposal of these wastes with your Field Environmental Representative.
- Wastes generated as part of a construction, operation, or maintenance procedure, such as water laden with dredged material and drilling mud should be contained and not allowed to flow into drainage channels, storm drains, or receiving waters.
- Contain non-hazardous liquid wastes in a controlled area and manner, such as a lined pit, lined roll-off bin with a sealed bottom, or a portable tank.
- Storage tanks used for collecting and settling non-hazardous water shall be routinely checked for leaks and to ensure they are not overfilled.
- Piping used to connect storage tanks shall be routinely checked to ensure connections are secure and not leaking.
- Containment devices must be of sufficient quantity or volume to completely contain the liquid wastes generated and, if uncovered, any additional volume needed for anticipated precipitation. A general rule of thumb for Southern California is that the additional containment volume for an anticipated rain event can be approximated by adding at least an additional four inches (a 4 inch rain) to the height of the containment sized for the entire waste volume. Contained material must be routinely removed and properly disposed of in accordance with federal, state and local requirements.

IMPORTANT POINT

- **Do not locate containment areas or devices where accidental release of the contained liquid can threaten health or safety, or discharge to watercourses, storm drain system, or to a water body.**
- Capture all liquid wastes running off a surface including wash water and rinse water from cleaning walls or pavement, including pressure washing.

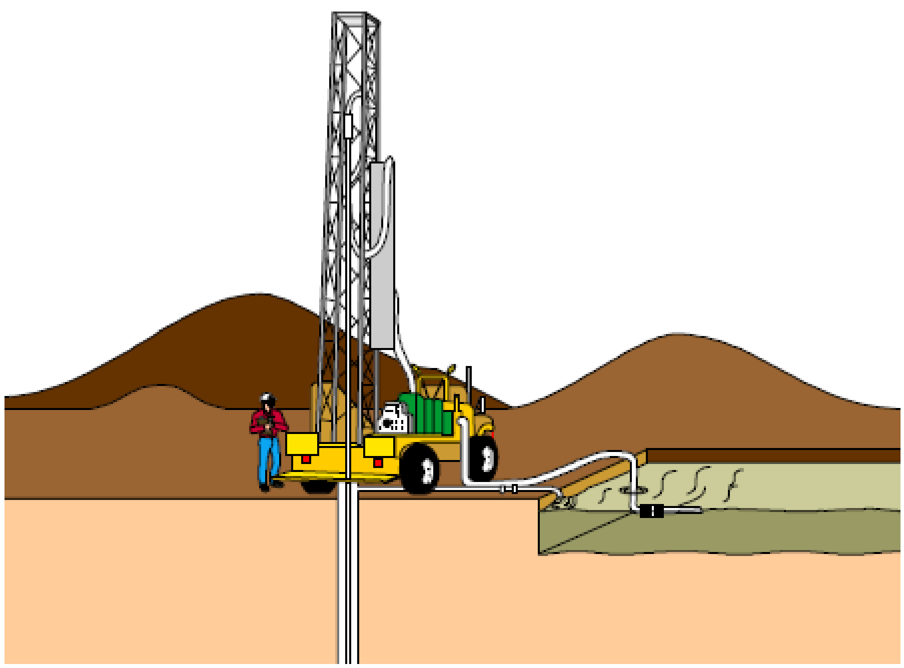
How (cont.)

- If the liquid waste is sediment laden, use a sediment trap (see BMP 1-10) or capture in a containment device and allow sediment to settle.
- Disposal of liquid wastes are subject to specific laws and regulations, or to requirements of other permits secured for the construction project. Contact your Field Environmental Representative for further information.

Maintenance and Inspection

- Remove deposited solids from containment areas and containment systems as needed, and at the completion of the project. Soil, dredged material and drilling mud to be transported offsite for reuse or disposal must first be profiled using chemical analysis. Liquid waste disposal may also need to be profiled prior to transportation and disposal. Contact the Field Environmental Representative as far in advance of the anticipated transportation need as possible.
- Inspect containment systems routinely for damage, and repair as needed.
- BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet WM-10

Section 3 – Non-Storm Water Discharge Controls

What Is Non-Storm Water?

Non-storm water is any water that does not originate as rain or snowmelt, or is rain or snowmelt that has come into contact with pollutants caused by human activities at construction and industrial sites, and commercial and residential sites.

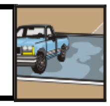
Why Are Non-Storm Water Discharge Controls Required?

Storm water conveyance systems (natural or manmade, wet or dry) are, by regulation, for conveying storm water or exempt or permitted non-storm water discharges only. Storm water conveyance systems eventually discharge to natural water bodies. Non-storm water, which may reach these storm water conveyance systems, may contain pollutants, such as sediment, that are harmful to the natural water bodies. Also, sediment from construction sites can clog storm water systems or reduce the volume of storm water that can be handled by the storm water system.

What Are Non-Storm Water Discharge Controls?

Non-Storm Water Discharge Controls include general site and operations BMP measures that minimize pollution of water. Non-Storm Water Discharge Controls presented in this Manual include the following:

- BMP 3-01 Dewatering Operations
- BMP 3-02 Paving Operations
- BMP 3-03 Vehicle and Equipment Washing
- BMP 3-04 Vehicle and Equipment Fueling
- BMP 3-05 Concrete/Coring/Saw Cutting and Drilling Waste Management
- BMP 3-06 Dewatering Utility Vaults
- BMP 3-08 Over-Water Protection
- BMP 3-09 Paint Removal Control
- BMP 3-10 Stream Crossings
- BMP 3-11 Clear Water Diversion



What Dewatering Operations is a procedural BMP for controlling construction or operations and maintenance dewatering to assure regulatory compliance.

When

- This BMP is applicable when groundwater from an excavation, trench, or non-storm water from a pipeline hydrostatic test must be removed.
- When excavation/trench dewatering, also see Environmental Standard (ES) 104.0226.
- When dewatering hydrostatic test water, also see ES 104.0220.

IMPORTANT POINT

- **This BMP is not Applicable to drilling mud or similar products used in drilling foundations (see BMP 2-08 "Non-hazardous Liquid Waste/Drilling Fluid Management")**
- **This BMP is not applicable to utility vault or sub-structure dewatering. For these applications, refer to the BMP 3-06 "Dewatering Utility Substructures and Vaults."**
- **This BMP is not applicable when the water is known, or suspected to be, contaminated. Under these conditions, contact your Field Environmental Representative.**
- **Water from dewatering operations cannot be discharged to the sanitary sewer, storm drain systems, drainages, creek beds (even if dry), or to water bodies without a permit. This prohibition includes groundwater dewatering to these conveyance systems or water bodies (groundwater may contain pollutants not easily detected except by analytical laboratory tests).**
- **Groundwater from excavation or trench dewatering or hydrostatic test water cannot be discharged to land without a permit or permit waiver. Groundwater and hydrostatic test water may contain pollutants not easily detected except by analytical laboratory tests.**
- Non-contaminated discharges of water from hydrostatic tests of new pipe utilizing potable water as a water source, reused for soil compaction and dust control, or reused for agricultural irrigation may be allowed to be discharged to land without a permit or under a permit waiver, depending on the local and regional regulatory requirements. Consult with your project Field Environmental Representative for permitting applicability prior to planning a discharge.

Where All construction sites and operations and maintenance activity sites that require excavation or trench dewatering, or pipe hydrostatic test discharges.

How Water generated by dewatering activities should be managed in accordance with the following procedures:

- If allowed by regulations, permit, or the regulating agencies, use the water for construction activities such as onsite soil compaction and dust control. If used for these applications, ensure that the water does not run-off to storm drain systems, drainages, creek beds (even if dry), or to water bodies.
    - The water may contain uncontaminated sediments, but the water must not be contaminated with other pollutants.

  Note: Discharge to land for site compaction, dust control or for infiltration (to groundwater) may require a permit or permit waiver to discharge from the Regional Water Quality Control Board (RWQCBs) and/or local jurisdictions (such as Flood Control District). Consult with your Field Environmental Representative.

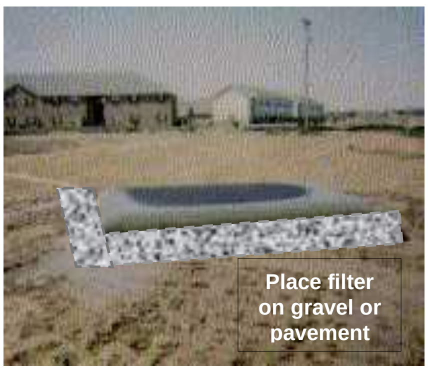
How (cont.)

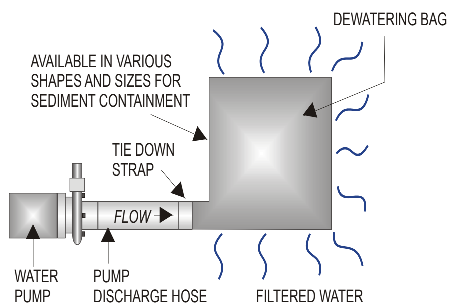
- If allowed by regulations, permit, or the regulating agencies, water from dewatering, that contains only uncontaminated sediment, may be discharged to one of the following:
    - To land for infiltration (also see soil compaction and dust control above). In some locations, a permit may be required from the RWQCB and/or a local jurisdiction (such as a Flood Control District). Consult with your Field Environmental Representative. The permit may allow sediment without settling or filtration. The permit may specify limits on other pollutants, requiring sampling and analysis, and submittal of analysis results prior to discharge approval. If allowed by regulations, permit, or the regulating agencies, infiltrate to an appropriate landscaped, vegetated, or soil area. If used for these applications, ensure that the water will infiltrate and not run-off to storm drain systems, drainages, creek beds (even if dry), or to water bodies. Land owner permission to discharge to land for infiltration is required.
    - To the Sanitation or Wastewater District Sanitary/Industrial Sewer - Requires a permit or approval of the above wastewater authority. District may require sampling and analysis and a Batch Discharge application (application for a short-term discharge of a stated volume) prior to approval. District may set a numeric limit on the amount of acceptable sediment discharged. District may require a fee, dependent on discharge volume and pollutant load.
    - To Surface Water (including storm drains) - A RWQCB discharge permit is required and a local jurisdiction permit (such a Flood Control District permit) may be required. Consult with your Field Environmental Representative. The permit may specify limits on sediment and other pollutants, require sampling and analysis, and the submittal of analysis results prior to discharge approval. These permits take advanced planning.
        - A surface water (including storm drains) discharge permit may have a numerical limit on the concentration of Total Suspended Solids (sediment) that can be discharged and a restriction limiting an increase in turbidity of the receiving water. Other pollutants, such as Oil and Grease (O&G) and Total Petroleum Hydrocarbons (TPH) may also have stringent numerical limits. As a minimum, contaminant-free temporary storage (Baker tanks) may need to be provided until permit coverage is obtained and sampling and analysis can be completed. A properly sized sediment clarifier and petroleum hydrocarbon treatment may be required. The cost of this potential treatment for discharge to surface waters should be compared to the treatment cost of discharging to the sanitary sewer (if logistically feasible) before deciding on this discharge option.
- Transport for Disposal in a Vacuum Truck for Proper Disposal. This option is usually the most expensive option and only utilized when the discharge options above cannot be permitted or is otherwise infeasible.
- If a permit is obtained for discharge to a storm water or sanitary sewer system, conduct all dewatering discharge activities in accordance with permit requirements, including installation of appropriate BMPs.
- Dewatering records should be maintained in accordance with permit requirements.

Maintenance and Inspection

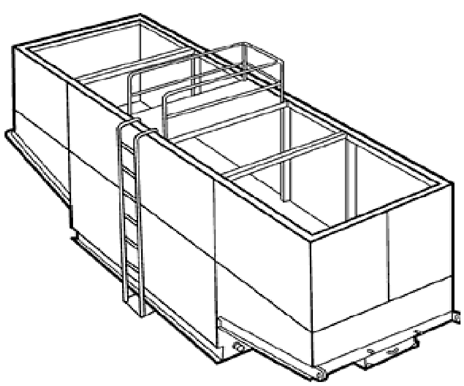
- Inspect pumps, hoses and all equipment before use to ensure they are in proper operating condition and free of contamination. Monitor dewatering operations to ensure it does not cause offsite discharge or erosion.
- Monitor the discharge for any change in characteristics (amount of sediment, oil sheen, color, etc.) that is not permitted. Stop the discharge immediately if there is a visual indication that the permit conditions are being exceeded.
- BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Sample dewatering discharges in accordance with permit requirements, if applicable.
- These operations and equipment should be made secure.

Pictures





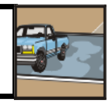
Gravity Bag Filter



Weir Tank

Corresponding CASQA Fact Sheet

Fact Sheet NS-2



What

Paving Operations is a procedural BMP for controlling non-storm water discharges associated with pavement surfacing or resurfacing, patching, or pavement removal.

Paving Operations activities may typically utilize the following materials:

- Cold mix,
- Asphalt,
- Chip Seal, Seal Coat, Tack Coat, Slurry Seal, Fog Seal, and
- Portland Cement Concrete.

For pavement grinding, saw cutting, coring or drilling, refer to BMP 3-05 "Concrete/Coring/Saw cutting and Drilling Waste Management."

When

Use this BMP whenever paving operations are being conducted.

Where

All construction or operations and maintenance work sites that have paving activities.

How

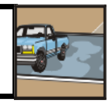
Use the following methods as applicable:

- Protect storm drain inlets near work and down gradient of the area to be paved (see BMP 1-06 "Storm Drain Inlet Protection").
- If onsite mixing is planned, an area must be designated for conducting the mixing. This area should already be paved or made impervious (e.g., plastic or wood sheeting) and be located away from storm drain inlets, drainages, or watercourses.
- Minimize overspray of tackifying emulsions or placement of other paving materials beyond the limits of the area to be paved. Schedule the application of tackifying agents according to manufacturer's instructions regarding rain events.
- Use dry methods to clean equipment and conduct cleaning in accordance with BMP 3-03 "Vehicle and Equipment Washing."
- Material use and stockpiles are to be managed in accordance with BMP 2-02 "Material Use" and BMP 1-08, "Stockpile Management."
- Collect and remove all broken asphalt and concrete, recycle when feasible, and dispose of materials in accordance with local, state, and federal requirements.

- **Do not apply asphalt, concrete paving, seal coat, tack coat, slurry seal or fog seal if rain is expected during the application or curing period.**
- **Avoid if possible, the transferring, loading, or unloading of paving materials near storm drain inlets, drainages, or watercourses. If not possible, use BMP 1-06 "Storm Drain Inlet Protection."**
- **CGP Risk Level 2 & 3 projects, that construct concrete structures onsite or store concrete mixing materials onsite, are subject to pH Numeric Action Levels (Risk 2) or pH Numeric Effluent Limits (Risk 3) for those drainage areas of the project where the concrete construction or storage of concrete mixing or waste materials take place.**
- **CGP Type 2 & 3 projects are subject to pH Numeric Action Levels (Type 2) or pH Numeric Effluent Limits (Type 3) for active areas.**

Maintenance and Inspection

- Inspect and maintain equipment and machinery routinely to minimize leaks.

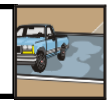


Maintenance and Inspection (cont.)

- Inlet protection BMPs prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.

Corresponding CASQA Fact Sheet

Fact Sheet NS-3



What

Vehicle and Equipment Washing is a procedural BMP for controlling vehicle and equipment washing on construction or operation and maintenance activity sites.

When

Onsite washing of vehicles and equipment on sites shall only be conducted when prior authorization has been received from the field Environmental Representative. Use this BMP on all sites when vehicle and equipment cleaning is being performed. Note that construction site vehicle and equipment washing is not typically performed on utility type construction sites unless required by safety considerations, or is necessary for work completion.

Where

Applicable to all construction and operation and maintenance sites where equipment or vehicles are washed.

How

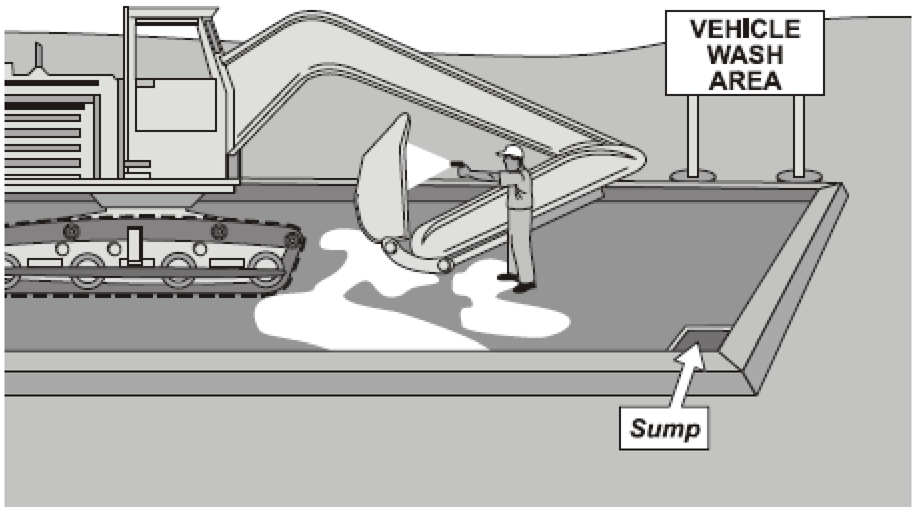
Use the following methods as applicable:

- Use dry cleaning methods such as wiping down, rather than water washing vehicles or equipment.
- If onsite vehicle washing is authorized by the Field Environmental Representative, use the following general methods:
  - Vehicle and equipment washing must be located away from storm drain inlets, drainage systems, or watercourses.
  - Place secured impermeable liners, sand bags or another type of berm around storm drain inlets and drainage systems to prevent wash water from entering a storm inlet, drainage system or watercourse. Secured, impermeable liners are preferable to sand bags. Sand bags are preferable to gravel bags. Sand bags are preferable to gravel bags because they are less porous, and are much better at preventing water and pollutants from passing through the barrier.
  - Never discharge wash water to the storm drain system, drainages, watercourses, or water bodies.
  - Use as little water as possible. High-pressure sprayers may use less water than a hose.
  - Use a positive shutoff valve to minimize water usage.
  - Collect all wash and rinse water for proper disposal.

Maintenance and Inspection

Monitor employees and contractors through the duration of the construction project to ensure appropriate practices are being implemented.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet NS-8

What

Vehicle and Equipment Fueling is a procedural BMP for controlling vehicle and equipment fueling at construction and operation and maintenance activity sites.

When

Use this BMP for construction and operation and maintenance activity sites when onsite fueling of vehicles and equipment, including handheld equipment, is planned or conducted.

Vehicle and equipment fueling, except for handheld equipment, is typically not done on a construction site. Onsite fueling of vehicles and equipment may be planned if it is impractical to send vehicles and equipment off site for fueling.

Handheld equipment is treated separately from other equipment. Handheld equipment includes those smaller, manually operated pieces of equipment such as trenchers, mowers, chainsaws, generators, and other equipment that need fueling during regular daily operation.

Where

All construction and operation and maintenance activity sites where vehicle and equipment fueling occurs.

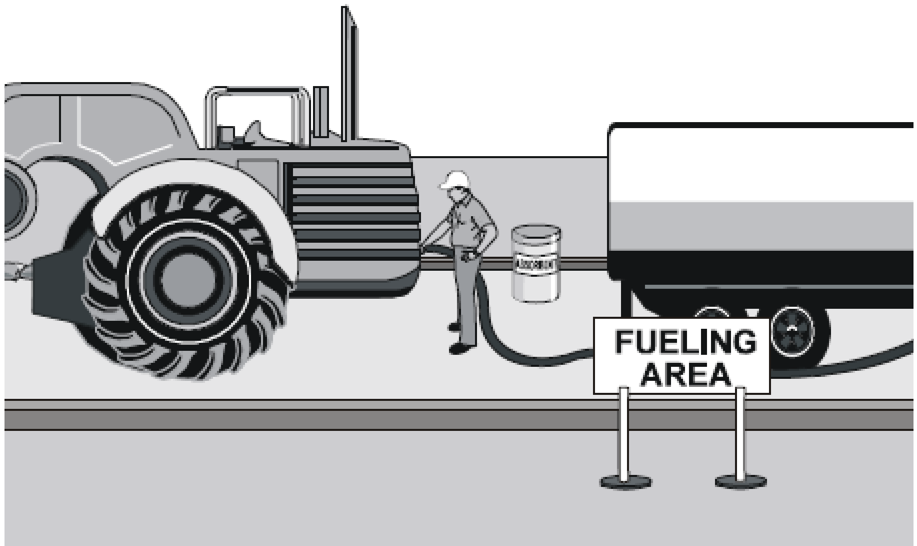
How

- If practical, fuel vehicles and equipment off site.
- Mobile fueling equipment is the preferred equipment used for construction site fueling.
- Fuel storage and fueling areas should be located away from storm drain inlets, drainage systems, watercourses, and water bodies.
- All fueling will be conducted with the fueling operator in attendance at all times regardless if fuel nozzles are equipped with automatic shutoff features.
- Fuel tanks should not be "topped off."
- All fueling operators should have readily available spill containment and cleanup equipment and materials.
- Clean up spills immediately and properly dispose of contaminated materials.
- Properly store and dispose of rags and absorbent material used to clean up spilled fuel.
- Mobile fueling trucks and operators must have all necessary permits, licenses and training.

Maintenance and Inspection

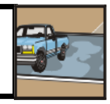
- Check to ensure that there is an adequate supply of spill cleanup materials available.
- Perform routine inspections of designated fueling areas and inspect vehicles and equipment for leaks.
- Report all spills immediately to the project Supervisor ***and***/or the Field Environmental Representative.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet NS-9



What

Concrete/Coring/Saw Cutting and Drilling Waste Controls are procedural BMPs for the proper management of liquid and solid wastes from concrete/coring/saw cutting and drilling activities.

For managing any concrete curing compounds, also use BMP 2-05 "Hazardous Materials/Hazardous Waste Management." For managing paving operations, use BMP 3-02.

When

Use this BMP at construction and operation and maintenance activity sites when the activity utilizes concrete and asphalt or when slurry or pavement/concrete wastes are generated by the activities, including:

- Saw cutting.
- Coring/drilling.
- Grinding, re-paving or patching.
- Encasing conduit in concrete.
- Tower footings.

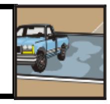
Where

All construction and operation and maintenance activity sites where the above activities are conducted.

How

- Install storm drain protection at any down-gradient inlets that may be impacted by the activity per BMP 1-06 "Storm Drain Inlet Protection."
- Minimize the amount of water used during coring/drilling or saw cutting. During wet coring or saw cutting, use a wet vacuum to lift the slurry from the pavement as the coring or saw cutting progresses. Additionally, sand bag barriers or other containment should be used at nearby down gradient storm drain or drainage inlets per BMP 1-06 "Storm Drain Inlet Protection."
- If concrete residue remains after drying, the area should be swept in a timely manner and residue removed to avoid contact with storm water or entering a storm drain or water body via the wind. If concrete residue still remains, pressure wash the surface, with in-progress vacuum recovery of wash water to remove residual material.

- **Do not wash residue or particulate matter into a storm drain or drainage inlet or a watercourse or water body.**
- The following options should be used for concrete truck chute and/or pump and hose washout:
  - If available, arrange to use an existing concrete washout station. Upon entering the site, concrete truck drivers should be instructed about proper site practices.
  - **Concrete Washouts:** Washout stations can be: self contained concrete trucks; commercial portable washout stations (rent-a-washout); plastic lined temporary pits, or a bermed and lined area designed with sufficient volume to completely contain all liquid and waste concrete materials plus enough capacity for rainwater. The lining must be impervious (such as Visqueen with no holes or tears). The designated area must be located away from storm drain inlets, drainages, watercourses, or water bodies.
  - **Washout in Trench:** Manually rinse the concrete truck chute into the lined trench itself. Note that this practice is not allowed on CGP projects, where minimum BMPs in the permit require containment of concrete washout areas and prohibits discharge into the underlying soil or surrounding areas. Check with the Field Environmental Representative regarding site-specific applicability.



How (cont.)

- ○ **Bucket Washout:** Manually rinse the chute into a wheelbarrow, plastic bucket or pail, and then empty the bucket into the concrete truck barrel or on top of the placed concrete within a trench or excavation. Prevent or protect against spillage, and clean up any spillage promptly.

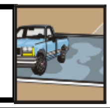
- **CGP Risk Level/Type 2 & 3 projects, that construct concrete structures onsite or store concrete mixing materials onsite, are subject to pH Numeric Action Levels (Risk/Type 2) or pH Numeric Effluent Limits (Risk/Type 3) for those drainage areas of the project where the concrete construction or storage of concrete mixing or waste materials take place.**

Maintenance and Inspection

- Responsible personnel should ensure that all drivers of concrete trucks arriving onsite are instructed about proper project practices.
- Clean out designated washout areas as needed or at a minimum when the washout is 75 percent full to maintain sufficient capacity throughout the project duration. Add additional designated areas as necessary and available to maintain capacity.
- Any designated onsite washout areas must be cleaned out and all debris removed upon project completion. Dispose of concrete waste according to BMP 2-04 "Solid Waste Management."
- Inspect routinely, when washout activities are underway to ensure the integrity of the concrete washout lining and that the concrete washout does not overflow.

Corresponding CASQA Fact Sheet

Fact Sheet WM-10



What Dewatering Utility Vaults is a procedural BMP for controlling water from dewatering utility vaults and underground structures. This BMP does not apply to trench, excavation or other general dewatering associated with construction activities, which is covered by BMP 3-01.

When This BMP is applicable whenever water must be removed from SDG&E utility vaults and underground structures.

Where All SDG&E utility vault locations.

How The discharge of clean water from dewatering of vaults and underground structures to the storm drain, drainages, or water bodies is allowed under the statewide General NPDES Permit for Discharges from Utility Vaults and Underground Structures to Surface Waters (Order No. 2006-0008-DWQ and NPDES No, CAG990002).

Discharges to land (e.g., vegetation, bare soil area) are not covered by this permit. A Waste Discharge Requirements (WDR) permit or waiver may be required by the local Regional Water Quality Control Board (RWQCB) for discharges to land. If a RWQCB does not have a general WDR or waiver for discharges to land, then the State Water Resources Control Board (SWRCB) General Permit for dewatering to land may apply. Consult with your Field Environmental Representative. Discharges to land also require the prior approval from the landowner.

General requirements for discharge under Order 2006-0008-DWQ/Permit Number CAG990002) are listed below:

- All vault dewatering discharges conducted by utility crews, including contractors, shall follow the latest version of SDG&E's Environmental Standards (ES) on Vault and Underground Structure Dewatering. For dewatering utility gas/electric vaults & underground structures follow ES http:/techdocs.sempra.com/doclib.nsf/docframe?openform&docno=G8718.
- Prior to discharge, the water in the vault shall be assessed in accordance with the requirements in the ES.
- A SDG&E-approved filter system with hydrocarbon removal capability is required to be used on the pump discharge for compliance assurance when dewatering to a surface water (drainage, gutter, storm drain inlet, or a water body).

- **If the water to be discharged is Clear Water as described in the ES, then the discharge to storm drains, drainages, or water bodies is acceptable as long as the discharge does not cause nuisance or harm to the environment.**
- Water discharged to the street, gutter, drainages, watercourses, or water bodies must be clean and clear, with no evidence of oil sheen and no chemical or sewage smell.
- The dewatering discharge must be monitored at all times during the discharge to ensure the discharge is "clean and clear" with no chemical or sewage odor. If the characteristics of the discharge change (i.e., color, smell, sheen), the discharge must be stopped immediately. In such an event call the Field Environmental Representative.
- Whenever possible, discharge the clean, clear water directly to the storm drain, drainage, or water body to avoid pre-existing pollutants in the discharge path. Pre-existing soil or contaminants in the path of the discharge (i.e., gutter) that can discolor/contaminate the discharge need to be cleaned up before discharging vault water.

IMPORTANT POINT

How (cont.)

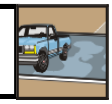
- **The discharge from the filter system must be clean and clear at all times, and if not, the discharge must be stopped.**
- As a last resort, when the water, because of sediment or pollutant contamination, cannot be discharged to the environment, contact the project Field Environmental Representative for transport of the water in an approved manner (see the linked SDG&E ES from the previous page).

Maintenance and Inspection

- Implement applicable provisions of the ES.
- Inspect pumps, hoses, filter system and equipment before use and routinely when applicable activities are underway.
- Observe dewatering activities to ensure they do not cause erosion or discharge of potential pollutants.

Corresponding CASQA Fact Sheet

Not applicable. See also Fact Sheet NS-2, Dewatering Operations



What

Over-Water Protection is a procedural and containment system BMP for protecting watercourses from overhead construction and maintenance and repair activities.

- Over-water construction and maintenance activities include, but are not limited to, chipping, grinding, scraping, welding/burning, painting, wrapping and coating of pipes and conduits.
- Watercourses (dry or wet) include drainages, creeks, streams, rivers, lakes and wetlands, bays, estuaries and oceans.

When

This BMP applies to projects when:

- Construction, maintenance or repair activities will be conducted above watercourses (dry or wet).

Prior to conducting over-water activities, check with the Field Environmental Representative for the possible need for permits with the appropriate local and state agencies. As an example, the design or installation of a containment system may itself impact the watercourse and require a permit, or the timing of the activity may impact wildlife breeding seasons, requiring a permit or preventing the activity during certain portions of the year.

Where

All construction or operation and maintenance activity above any portion of a watercourse.

How

Use the following measures as applicable:

- Containment systems must be properly designed and installed prior to the beginning of any operation that may impact a water body to prevent discharge of pollutants to surface waters, taking into account the construction or maintenance activity and factors such as wind, rain, etc.
- The work area should be kept clean of all trash and potential pollutants.
- Containment booms should be placed around the area of work as necessary to contain the discharge of potential contaminants such as oil and hydraulic fluid.
- Special attention should be given to existing and forecasted wind and weather conditions to prevent pollutant discharges to surface waters.
- Shrouds of appropriate material should be used to prevent paint overspray, welding slag, and other pollutants from entering surface waters. Shrouding may not be effective during periods of high wind.
- Shrouds should be large enough to adequately enclose or segregate the working area from surface waters. This may include a plywood barrier, Visqueen, and scaffolding to help prevent fugitive material from entering surface waters.
- Support structures such as scaffolding shall be used in conjunction with shrouding to withstand potential wind stress.
- Contaminated shrouding material and equipment shall be thoroughly cleaned or disposed of properly.

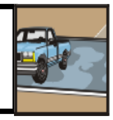
Maintenance and Inspection

- Inspect the containment systems, shrouds, and support structures prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable) to ensure their integrity and safety. Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event.

Pictures

Corresponding CASQA Fact Sheet

Fact Sheet NS-14



What

Paint Removal Control is a procedural BMP for protecting storm water and water courses from mark-out paint or graffiti paint removal activities.

When

Use this BMP when utility activities have used mark-out paint on surfaces and the paint is required to be removed by local jurisdictions or another authority, or when graffiti on company property is discovered and must be removed.

Where

Mark-out paint is usually used on road, sidewalk, and land surfaces to show the location of underground utility services. Graffiti on company property may have been painted on company fences or walls, buildings, walkways, curbs or other surface.

How

Use the following options to remove mark-out paint or graffiti:

- Use non-toxic, light degradable mark-out paint when possible.
- Avoid the use of chemical paint removers whenever possible. When chemical paint removers are required, only use products that have been approved through the product review process and utilize containment and wet vacuuming of material during the removal process.
- Hydro pressure wash.
- Dry abrasive blast/grinding.
- Wet abrasive blast/grinding.

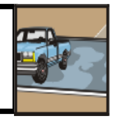
Use one or more of the following methods to promptly and effectively contain and remove paint and residues in order to protect storm water sewers, drainages and watercourses:

- Dry sweep.
- Install storm drain inlet protection at down gradient inlets during hydro pressure washing, wet abrasive blasting, grinding, and chemical removal. Discharge of any wet or dry residuals or wash water to the drainage system is prohibited.
- Minimize the amount of water used during hydro pressure washing.
- Wet or dry vacuum.
- Use wet vacuum to lift the paint slurry from the pavement or surface as hydro pressure washing progresses or as soon as possible, and before the material has a chance to migrate from the work area.
- If wet vacuuming is not adequate to capture all wastewater from these activities, use additional containment (sand bags, booms, or other containment devices) methods as near the work area as possible to prevent the discharge to a street, gutter, storm drain/drainage inlet, or watercourse.
- If paint residue remains after drying, the area should be swept up and residue removed in a timely manner to avoid contact with storm water.
- If paint residue remains after sweeping, the area can be water washed, as long as the water containing the paint residue is contained near the work and wet vacuumed and not allowed to enter storm drain inlets or watercourses.
- All waste should be disposed of using the BMP 2-08 "Non-Hazardous Liquid Waste Management."

Maintenance and Inspection

- Inspect all containment systems to ensure proper placement prior to starting utility paint removal operations.
- Inspect equipment frequently and adjust as necessary to maximize efficiency and minimize water or other material use of the paint removal operations.

Corresponding CASQA Fact Sheet NA



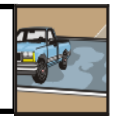
What

A stream crossing is a culvert, ford, or bridge placed across a waterway to provide access for construction or operations and maintenance activities. Utility stream crossings are not intended to maintain public traffic and project-specific permits may be required for use (see "Limitations"). The crossing design and construction allows safe access and reduces erosion and downstream sediment from vehicles.

The project Field Environmental Representative should be consulted for any permit requirements and for the stream crossing location.

The following types of stream crossing should be considered:

- **Culverts:** Appropriate to control erosion, but may cause erosion during installation/removal without appropriate BMP measures. Easily constructed and allows for heavy equipment loads.
- **Fords:** A ford is a streambed crossing alternative that involves crossing a waterbody at grade, on a hard surface maintained at the streambed bottom. Appropriate during dry weather and in arid areas in dry washes, ephemeral streams, and low-flow perennial streams. Ford crossings generally involve the placement of gravel or other non-erodible material to facilitate crossing and are appropriate for streams that would benefit from additional clean native or compatible gravel; for example, salmonid streams or rivers below reservoirs, and urban, channelized streams. Fords provide minimum sediment and erosion control in a stream channel and are most appropriate when the potential for stream channel erosion and dislodgement of sediment due to the addition of the material and traffic is low. A ford is the least expensive stream crossing, allows for maximum load limits, and offers very low maintenance. Fords may degrade water quality due to vehicle and equipment contact. Direct placement of gravel may be appropriate for short-term use. In addition, soil-confinement systems can also be used in low-flow intermittent stream crossings for ease with implantation and removal. Examples include:
  - Cellular Confinement Systems (CCS) crossings consist of three-dimensional cellular-type material placed on the streambed bottom and filled with rock or soil. CCSs are an effective option when used in conjunction with ford crossings because it is sufficient to support most construction equipment and is readily removable.
  - Articulated concrete mats (e.g., concrete blocks held together by steel cable or interlocking concrete blocks) can also be used for fording a stream. Articulated concrete mats can be used to harden the streambed for crossing. Gravel should be placed on the mats to fill in the voids between concrete blocks.
  - Gabion mattresses consisting of rock contained in rectangular, wire-mesh can also be used for constructing a hard driving surface. Gabion mattresses are strong and durable, flexible structures, and are easily constructed.
- **Bridges:** Appropriate for streams with high flow velocities, steep gradients, and where temporary restrictions in the channel are not allowed. Bridges are more expensive to design and construct, but provide the least streambed disturbance and waterway flow constriction.



What (cont.)

IMPORTANT POINT

Limitations:

- Installation may cause a waterway constriction, which can obstruct flood flow and cause flow backups, washouts, and/or scouring.
- **Installation may require RWQCB 401 Certification, USACOE 404 permit and approval by the California Department of Fish and Game. If numerical water quality standards are mentioned in any permits, sampling and testing may be required.**
- Installation and removal will usually disturb the waterway, and may require dewatering or temporary stream diversion.
- Soil confinement systems used for stream crossings must be constructed in accordance with the manufacturer's specifications, and inspected and maintained for structural integrity.
- Gravel use in the stream for soil-confinement system crossings will require agency approval.
- Requires other BMPs to minimize soil disturbance during installation and removal.

When

Stream crossings are installed at sites when:

- Appropriate permits have been secured for activities and for the stream crossing.
- Construction or operation and maintenance equipment or vehicles need to frequently cross a waterway.
- Alternate access routes impose significant constraints.
- Crossing perennial streams or waterways without a stream crossing causes significant erosion.

Where

Stream crossings should be installed at all designated crossings of perennial and intermittent streams and in dry channels that may be significantly eroded by construction or operation and maintenance traffic at locations where:

- Erosion potential from the installation is low.
- Site runoff is not directed towards the crossing in a manner that promotes erosion of the crossing.

How

IMPORTANT POINT

Minimum standards and specifications for the design, construction, maintenance, and removal of the structure should be established by a California Registered Civil Engineer, and for bridges, a California Registered Structural Engineer. The design flow and stability safety factor should be based on risk evaluation of overtopping, flow backups, or washout.

Construction and Use:

- Install sediment traps immediately downstream of the crossings to capture sediment. Sediment traps may also be required to be part of the crossing permit. For CCS ford crossings, the gravel depth should be 6 to 12-inches to support construction vehicular traffic. Clean, washed, angular or rounded gravel should be used with cellular-block confinement systems.
- Avoid oil or other potentially hazardous materials for surface treatment.

How (cont.)

- Stabilize construction roadways, work area, and streambed bottom against erosion. Stream bed and bank stabilization, if necessary, may also be required to be part of the crossing permit.
- Construct during dry periods to minimize stream disturbance and reduce costs.
- Construct at or near the streambed elevation to prevent potential upstream flooding.
- Install erosion control BMPs to minimize erosion of embankment into flow lines.
- Any artificial obstruction placed within flowing water should only be built from material that will not introduce sediment or silt into the watercourse.
- Vehicles and equipment should not be driven, operated, fueled, cleaned, maintained, or stored in the wet or dry portions of a water body. Wetland vegetation, riparian vegetation, or aquatic organisms could be destroyed.
- The exterior of vehicles and equipment that will encroach on the water body should be maintained free of grease, oil, fuel, and residues.
- Drip pans should be placed under all vehicles and equipment placed over water bodies (e.g., bridges) when the equipment is planned to be idle for more than one hour.
- Disturbance or removal of vegetation should not exceed the minimum necessary to complete operations. Disturbed vegetation should be replaced with the appropriate soil stabilization measures.
- Riparian vegetation, when removed pursuant to the work provisions, should be cut off no lower than the ground level to promote rapid re-growth. Access roads and work areas built over riparian vegetation should be covered by a sufficient layer of clean river run cobble to prevent damage to the underlying soil and root structure. The cobble must be removed upon completion of project activities.

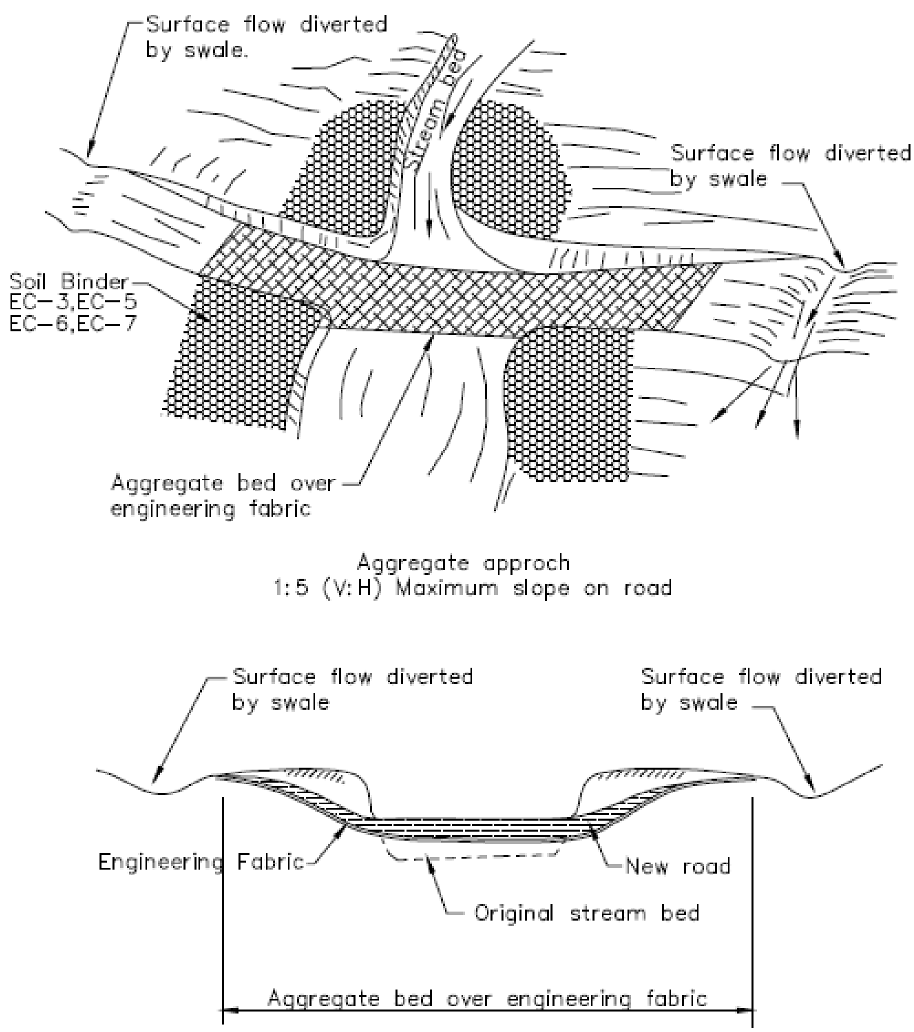
Maintenance and Inspection

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect prior to and after each storm event, daily during extended rain events during the construction and/or clean-up activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Check for blockage in the channel, sediment buildup or trapped debris in culverts, blockage behind fords or under bridges.
- Check for erosion of abutments, channel scour, riprap displacement, or other signs of erosion.
- Check for structural weakening of the crossings, such as cracks, and undermining of foundations and abutments.

Maintenance and Inspection (cont.)

- Remove sediment that collects behind fords, in culverts, and soil confinement systems. Removal of undesirable sediment may be required to be part of the crossing permit.
- Replace lost or displaced support aggregate from inlets and outlets of culverts and soil confinement systems.
- With proper BMPs, remove temporary stream crossings promptly when it is no longer needed.

Pictures



TYPICAL FORD CROSSING
NOT TO SCALE

Corresponding CASQA Fact Sheet

Fact Sheet NS-4

What

Clear water diversion is a system of structures and measures that intercept clear surface water runoff upstream of a construction project or operation and maintenance activity, transport it around the work area, and discharge it downstream with minimal water quality degradation. It encloses a construction area in a waterway and reduces sediment pollution from construction in, or adjacent to water. Structures commonly used as part of this system include diversion ditches, berms, dikes, slope drains, rock, gravel bags, wood, aqua barriers, cofferdams, filter fabric, or turbidity curtains, drainage or interceptor swales, pipes, or flumes.

Limitations:

- Diversion activities will usually disturb the waterway during installation/removal.
- Installation may require RWQCB 401 Certification, USACOE 404 permit and approval by California Department of Fish and Game. If numerical water quality standards are mentioned in any permits, sampling and testing may be required.
- Diversion activities may constrict the waterway, obstruct flood flows, and cause flooding or washouts. Diversion structures should not be installed without identifying potential impacts to the stream channel.
- Diversion or isolation activities are not appropriate in channels where there is insufficient stream flow to support aquatic species in the dewatered area or if they will disturb sensitive aquatic species.
- Diversion or isolation activities are inappropriate in deep water unless designed and reviewed by a California Registered Civil Engineer.
- Diversion or isolation activities should not completely dam stream flow.
- Dewatering and removal may require additional sediment control or water treatment.

When

Clear water diversions should be implemented when:

- Isolating construction or operations and maintenance activities is necessary within or near a water body to protect the water body from the activity. Applicable activities may include but are not limited to: stream bank stabilization, culvert, bridge, pier, or abutment installation. They may also be used in combination with other methods, such as clear water bypasses and/or pumps.

Where

- A clear water diversion is typically implemented where appropriate permits have been secured and work must be performed in a flowing stream or water body.
- Pumped diversions are suitable for intermittent and low flow streams.
- Excavation of a temporary bypass channel, or passing the flow through a flume with a trench excavated under it, is appropriate for the diversion of streams less than 20 feet wide, with flow rates less than 100 cubic feet per second.
- Clear water diversions incorporating clean washed gravel may be appropriate for use in fish spawning streams.

How In general:

- Where working areas encroach on flowing streams, barriers adequate to prevent the flow of muddy water into streams should be constructed and maintained. During construction of the barriers, stream muddying should be minimized.
- Diversion structures must be adequately designed to accommodate fluctuations in water depth or flow volume due to tides, storms, floods, etc.
- Equipment driven in a water body should be clean of petroleum residue, and water levels should be below the fuel tanks, gearboxes, and axles, unless lubricants and fuels are sealed such that water inundation will not result in pollutant discharges.
- Only excavation equipment buckets may reach out into the water body to remove or place fill. The main equipment body should not enter the water except as necessary to cross the stream to access the work site.
- Stationary equipment, such as motors or pumps located within or adjacent to a water body, should be positioned over drip pans.
- When any artificial obstruction is being constructed or maintained, sufficient water should at all times pass downstream to maintain aquatic life.
- Equipment should not park below high water marks unless allowed by permit.
- Disturbance or removal of vegetation should be minimized. Disturbed vegetation should be replaced with appropriate erosion control measures.
- Riparian vegetation, when removed pursuant to the work provisions, should be cut off no lower than the ground level to promote rapid re-growth. Access roads and work areas built over riparian vegetation should be covered by a sufficient layer of clean river run cobble to prevent damage to the underlying soil and root structure. The cobble must be removed upon completion of project activities.
- Drip pans should be placed under all vehicles and equipment placed structures over water bodies when the equipment is planned to be idle for more than one hour.
- Where possible, minimize diversion and encroachment impacts by scheduling construction during periods of low flow. Scheduling should also consider seasonal releases of water from dams, fish migration, and spawning seasons, and water demands due to irrigation.
- Construct diversion structures with materials free of potential pollutants such as soil, grease, or oil.

Several types of clear water diversions are detailed in the CASQA Handbook, each with different applications, design considerations, limitations, and inspection and maintenance requirements. These types of diversions include:

- Temporary Diversions and Encroachments
- Temporary Dry Construction Areas
- Filter Fabric Isolation

How (cont')

- Turbidity Curtain Isolation
- K-Rail River Isolation
- Stream Diversions

The CASQA Handbook should be consulted for additional information for these clear water diversions.

Maintenance and Inspection

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two week intervals in the non-rainy season to verify continued BMP implementation (e.g., or in compliance with the frequency specified in the CGP, if applicable).

Pictures

Corresponding CASQA Fact Sheet

Fact Sheet NS-5

Section 4 – Soil Erosion Control

What is Erosion?

Erosion is the detachment of soil particles by water or wind. Erosion is a natural process that can be accelerated by construction activities such as grading and trenching. For example, when a site is cleared and grubbed, protective vegetation is removed and the disturbed soil is directly exposed to wind, rain, and flowing water.

Why is Erosion Control Required?

Water or wind can transport soil particles to water bodies where they can cause damage to, or destruction of, aquatic animals and plants by burying them or reducing oxygen and/or sunlight that is necessary for their survival. Erosion control is required by regulatory agencies to minimize the potential additional erosion and damage to the environment from construction activities.

What is Erosion Control?

Erosion Controls are methods used to protect the soil surface and prevent the soil particles from being detached and transported by rain, flowing water or wind. Erosion controls include limiting soil or vegetation disturbance to reduce erosion. Preservation of Existing Vegetation is an example of an Erosion Control BMP.

Soil Stabilization is the most widely used and most effective method of erosion control. Preventing or reducing erosion potential by directing or controlling drainage runoff, as well as preparing and stabilizing disturbed soil areas protects the exposed soil surface from rain and wind thereby preventing erosion. Diversion Berms and Drainage Swales is an example of an erosion control BMP that intercepts and conveys run-on around or through the project reducing erosion potential. Hydroseeding is also an example of an erosion control BMP that stabilizes the soil. Erosion control BMPs used in this Manual to direct or control runoff and/or stabilize soil include:

- BMP 4-01 Preservation of Existing Vegetation
- BMP 4-02 Temporary Soil Stabilization (General)
- BMP 4-03 Hydraulic Mulch
- BMP 4-04 Hydroseeding
- BMP 4-05 Soil Binders
- BMP 4-06 Straw Mulch
- BMP 4-07 Geotextiles, Plastic Covers, and Erosion Control Blankets/Mats
- BMP 4-08 Dust (Wind Erosion) Control
- BMP 4-09 Diversion Berms and Drainage Swales
- BMP 4-10 Velocity Dissipation Devices
- BMP 4-11 Slope Drains
- BMP 4-12 Streambank Stabilization
- BMP 4-13 Soil Preparation

What

Preservation of Existing Vegetation is a procedural BMP that maximizes the preservation of existing trees, shrubs, bushes, and grasses on a construction or operations and maintenance activity site.

When

This BMP is applicable to utility activities when there is existing vegetation.

Where

All construction and operations and maintenance activity sites where:

- There are areas on site where no activity is planned or will occur later.
- There are areas with vegetation that can be preserved to protect against soil erosion, such as on steep slopes, watercourses, and building sites in wooded areas.
- There are areas designated as ESAs, or where federal, state, or local government regulations require preservation, such as wetlands, vernal pools, marshes, etc.

How

Use the following measures as applicable:

- Preserve existing vegetation whenever possible.
- Identify areas to be preserved in the immediate vicinity of the construction or activity site, and mark as appropriate before clearing and grubbing or other soil disturbance activities.
- If necessary, contact the project Field Environmental Representative for any clarification regarding areas to be preserved.
- Whenever possible, minimize disturbed areas by locating temporary roadways to avoid stands of trees and shrubs and follow existing contours to reduce cutting and filling.
- Construction materials, equipment storage and parking areas should be located outside the drip line of any tree to be retained.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Remove any markings, barriers, or fencing after project is completed.

Maintenance and Inspection

- Maintain the clearly marked limits of disturbance during construction to preserve vegetation.
- Inspect barriers regularly during construction.

Pictures

Vegetation to be preserved is marked and outside the work area.

Corresponding CASQA Fact Sheet

Fact Sheet EC-2

What

Temporary Soil Stabilization is a procedural BMP utilizing protective materials to cover exposed soil, where the soil exposure is caused by construction or operation and maintenance activities. Materials may include hydraulic mulch and seeding, soil binders, straw, geotextiles, plastic covers and erosion control blankets.

Temporary soil stabilization BMPs and their associated materials include:

- BMP 4-03 - Hydraulic Mulch
- BMP 4-04 - Hydroseeding
- BMP 4-05 - Soil Binders
- BMP 4-06 - Straw Mulch
- BMP 4-07 - Geotextiles, Plastic Covers and Erosion Control Blankets/Mats

When

This BMP, and the situation appropriate BMPs listed above, is applicable when slopes are constructed or disturbed and/or where there are inactive soil disturbance areas that will not be worked for 14 days or more. The procedures are to be implemented after slope construction activity is complete and then prior to the onset of precipitation.

Where

- Slopes, soil stockpiles, and inactive disturbed soil areas.
- Soil binders (BMP 4-05) may be applicable to areas where there is light traffic that would minimize the effectiveness of other temporary soil stabilization BMPs.

How

- Sediment control BMPs used to break up the slope lengths, such as fiber rolls (BMP 1-03) or gravel bag berms (BMP 1-04) should be spaced in accordance with the CGP requirements (see installation for BMP 1-03 "Fiber Rolls")
- Permanent erosion control shall be applied to areas deemed substantially complete during the project's defined seeding season window.
- Refer to individual temporary soil stabilization BMPs for specific instructions for use (see BMP 4-03 through BMP 4-07).

Maintenance and Inspection

- Refer to individual temporary soil stabilization BMPs listed above for maintenance and inspection requirements.

Pictures

Applying a tackifier using a trailer mounted pump and hose.

Applying soil stabilization manually in harder to reach areas.

Corresponding CASQA Fact Sheet

Fact Sheet EC-2

What Hydraulic Mulch is a procedural BMP for applying mulch to protect the soil surface from wind and rain erosion.

Mulch consists of a mixture of shredded wood fiber or other fiber in water and a stabilizing emulsion, or tackifier. The mulch is applied with hydro-mulching equipment (water mixture spraying equipment).

When Hydraulic mulch is typically applied when a temporary soil cover is required for protection until permanent vegetation is established, or to disturbed areas that must be re-disturbed following a period of inactivity of 14 or more days.

Where

- To disturbed areas requiring temporary protection.
- Do not apply to active work areas where the mulch would interfere with or be destroyed by immediate earthwork activities or construction traffic. Consider using soil binders instead (BMP 4-05).

How

- Prior to application, roughen embankment and fill areas with a crimping or punching type roller or by track walking. Track walking shall only be used where other methods are impractical and slope angle allows safe equipment operation. Track walking must be performed upslope so that equipment tracks traverse the slope horizontally along the slope.
- Avoid mulch over-spray onto the traveled way, sidewalks, lined drainage channels, and existing vegetation.
- Avoid use of mulch without a tackifier component, especially on slopes.
- Hydraulic Mulches:
  - Apply as liquid slurry using a hydraulic application machine (i.e., hydroseeder) at rates of mulch and stabilizing emulsion recommended by the manufacturer. Wood fiber hydraulic mulches are generally short-lived (only last a part of a growing season) and must be applied no less than 24 hours before rain events to dry and become effective.
    - Hydraulic Mulch with Binder (Matrix):
  - Apply a combination of wood fiber and/or paper fiber mixed with acrylic polymers as binders. Apply the mulch matrix as liquid slurry using a hydraulic application machine (i.e., hydroseeder) at rates recommended by the manufacturer. Hydraulic matrices must be applied no less than 24 hours before a rain event to dry and become effective.
    - Bonded Fiber Matrix (BFM):
  - Apply BFM using a hydraulic application machine (mulch and tackifier are pre-mixed in a single bag) in accordance with manufacturer's instructions. Do not apply immediately before, during, or after a rain event.
  - Note that cellulose fiber mulches alone may not perform well on steep slopes or in coarse soils.

Maintenance and Inspection

- Maintain an unbroken, temporary mulched ground cover throughout the period of construction when the soils are not being reworked. Inspect before expected rain and repair any damaged ground cover and re-mulch areas of exposed soil (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable).
- After any rain event, maintain all slopes to prevent erosion.

Pictures

Applying hydraulic mulch.

Close-up of bonded fiber matrix

Corresponding CASQA Fact Sheet

Fact Sheet EC-3

What

Hydroseeding is a procedural BMP for the application of vegetation seed in a protective mixture for both soil and seed. The seed then sprouts, providing vegetation that provides additional soil erosion control (holds the soil in place and shields the soil from erosion). Hydroseeding material typically consists of a mixture of fiber, seed, fertilizer, and stabilizing emulsion.

When

- When temporary protection is needed until permanent vegetation protection can be established. Temporary vegetation should not be used for more than 3 to 6 months.
- Avoid using hydroseeding during dry weather periods, unless supplemental irrigation is used.

Where

- Use on disturbed soil areas that must be re-disturbed following construction inactivity of 14 or more days.
- Avoid use of hydroseeding in areas where the BMP would be incompatible with site conditions. These conditions include:
    - Slopes steeper than 1:3 vertical: horizontal. Steep slopes are difficult to protect with temporary seeding.
    - Traffic areas, where construction or other traffic would prevent seed sprouting or vegetation growth. Consider using soil binders instead (see BMP 4-05).

How

- Hydroseeding can be accomplished using a multiple-step (with straw mulch) or a one-step process (mixed with hydraulic mulch, hydraulic matrix, or bonded fiber matrix). When the one-step process is used to apply the mixture of fiber, seed, etc., the seed rate shall be increased to compensate for all seed not having direct contact with the soil. Confirm with your project Field Environmental Representative the appropriate seed mix to be used.
- Prior to application roughen the slope, fill area, or area to be seeded with the furrows trending along the contours.
- Apply straw mulch as necessary to keep seeds in place and to moderate soil moisture and temperature until the seeds germinate and grow.
- Follow-up applications shall be made as needed to cover weak spots, and to maintain adequate soil protection.
- Avoid over-spray onto the travel way, sidewalks, drainage channels and existing vegetation.

Maintenance and Inspection

- All seeded areas shall be inspected for failures and re-seeded, fertilized, and mulched within the planting season, using not less than half the original application rates. Any temporary re-vegetation effort that does not provide adequate cover must be re-vegetated.
- After any rainfall event, maintain all slopes to prevent erosion.

Pictures

Applying hydroseed.

Corresponding CASQA Fact Sheet

Fact Sheet EC-4

What Soil Binders is a procedural BMP for applying soil binder material to the soil surface to temporarily prevent water-induced erosion of exposed soils on construction or applicable operations and maintenance sites. Soil binders bind with the soil, creating a crust that sheds water and prevents the water erosion. Soil binders also provide temporary dust, wind, and soil stabilization benefits.

When Soil binders are typically applied to disturbed soil areas that require short-term temporary protection.

Soil binders have the following application timing limitations:

- May not cure when low temperatures occur within 24 hours of application.
- Soil binders generally experience spot failures during heavy rain and may need reapplication after a storm.
- Some soil binders may not perform well during periods of low relative humidity.

Where Soil binders can be used for any disturbed soil area. Soil binders can often be incorporated into the work so they may be a good choice for areas where grading activities will soon resume or that experience light construction traffic.

Soil binders have the following limitations for particular areas of application:

- Soil binders may not penetrate areas where soil surfaces are made up primarily of silt and clay, particularly when compacted.
- Soil binders may not hold up well in areas of heavy pedestrian or medium to heavy vehicular traffic.

How Selection of soil binders should be approved by the project Field Environmental Representative after an evaluation of site-specific factors. Chemical soil binders must be on the SDG&E List of Approved Products. These approved soil binder products have low or no toxicity to aquatic organisms and wildlife and may not trigger the construction site sampling requirements of the CGP. Follow manufacturer's recommendations for application procedures and cleaning of equipment after use. Any onsite cleaning must use appropriate BMPs (BMP 2-02 "Material Use", 2-03 "Spill Control", 2-04 "Solid Waste Management", 2-08 "Liquid Waste/Drilling Fluid Management", and 3-03 "Vehicle and Equipment Washing").

- Prior to application, roughen embankment and fill areas. Track walking shall only be used where rolling is impractical.
- Soil binders should not be applied during or immediately before rain events. Soil binders must be applied no less than 24 hours before rain to cure and dry and become fully effective.
- Avoid over-spray onto paths, sidewalks, lined drainage channels, sound walls, and existing vegetation.

IMPORTANT POINT

- **Do not apply soil binders to frozen soil, areas with standing water, under freezing conditions, or when the temperature is below 40°F during the curing period.**
- More than one treatment is often necessary, although the second treatment may be diluted or have a lower application rate.
- For liquid agents:
    - Crown or slope ground to avoid ponding.
    - Uniformly pre-wet ground according to manufacturer's recommendations.
    - Apply solution under pressure. Overlap solution 6 to 12 inches.

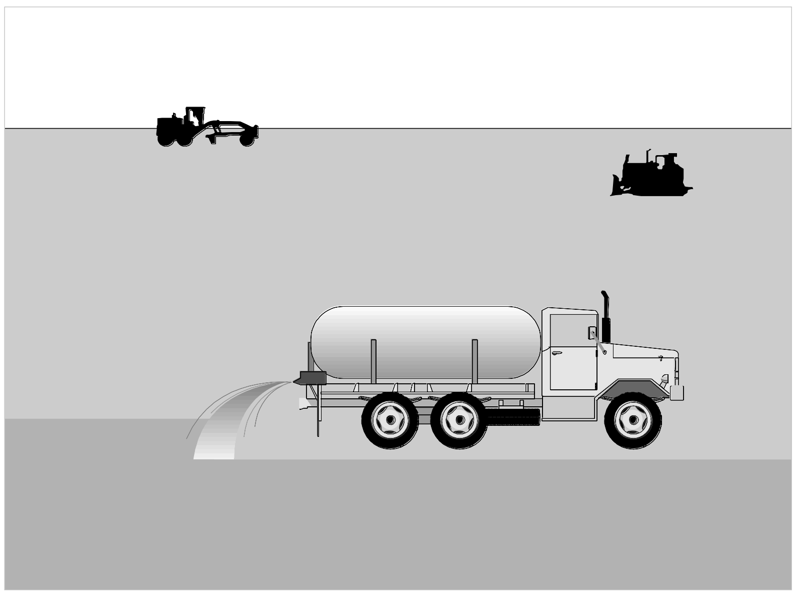
How (cont')

- Allow treated area to cure for the time recommended by the manufacturer; typically at least 24 hours.
- Apply second treatment before first treatment becomes ineffective, using 50 percent application rate.
- In low humidity, reactivate chemicals by re-wetting according to manufacturer's recommendations.

Maintenance and Inspection

- Reapplying the selected soil binder may be needed for proper maintenance. Traffic areas should be inspected routinely.
- After any rainfall event, maintain all slopes to prevent erosion.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet EC-5

What Straw Mulch is a procedural BMP for the application of a uniform layer of straw to exposed soil surfaces to protect exposed soil from rain and wind erosion. Straw mulch consists of straw, and may incorporate a tackifier emulsion for stabilization of the mulch when used for protecting sloped areas of exposed soil.

When Straw mulch is used when:

- Temporary soil stabilization surface cover is needed on disturbed areas until soils can be prepared for re-vegetation and permanent vegetation is established.
- In combination with temporary and/or permanent seeding strategies to enhance plant establishment. Straw mulch typically lasts less than six months.

Limitation: There is a potential for introduction of weed-seed and unwanted plant material with straw. Certified Weed free rice straw must be used when it is important not to introduce unwanted plants.

Where Application of straw mulch is applicable to flat areas of exposed soil and areas of exposed soil with gradual slopes.

How Use tackifier to anchor straw mulch to the soil on slopes. Tackifiers act to glue the straw fibers together and to the soil surface, and the tackifier shall be selected based on longevity and ability to hold the fibers in place. Soil binders (tackifier) will generally experience spot failures during heavy rain events. A tackifier is typically applied at a rate of 125 pounds per acre. In windy conditions, the rates are typically 150 pounds per acre.

- Crimping, punch roller-type rollers, or track-walking may also be used to incorporate straw mulch into the soil on slopes. Track walking shall only be used where other methods are impractical.
- Avoid placing straw onto construction traffic ways, sidewalks, lined drainage channels, and existing vegetation.
- Straw mulch with tackifier shall not be applied during or immediately before rain events.
- Apply loose straw at a rate between 3,000 and 4,000 pounds per acre (lb/acre), either by machine using a straw blower or by hand distribution and provide 100 percent ground cover. Use a lighter application on flat surfaces and a heavier application on slopes.
- The straw mulch must be evenly distributed on the soil surface.
- Anchor mulch in place by "punching" it into the soil mechanically in lieu of using a tackifier. "Punching" of straw does not work in sandy soils.
- Methods for holding the straw mulch in place depend on the slope steepness, accessibility, soil conditions and longevity. If the selected method is incorporation of straw mulch into the soil, then proceed as follows:
    - A tackifier acts to glue the straw fibers together and to the soil surface. Selection of a tackifier should be based on longevity and ability to hold the fibers in place. Application of a tackifier is typically at a rate of 125 lb/acre and 180 lb/acre in windy conditions.
    - On very small areas, a spade or shovel can be used.
    - On soil slopes which are stable enough, and gradually sloped to safely support construction equipment without contributing to compaction and instability problems, straw can be "punched" into the ground using a knife-blade roller or a straight bladed coulter, known commercially as a "crimper."

How (cont')

- On small areas and/or steep slopes, straw can also be held in place using plastic netting or jute. The netting shall be held in place using 11 gauge wire staples, geotextile pins or wooden stakes (BMP 4-07), "
- On small areas and/or steep slopes, straw can also be held in place using plastic netting or jute. The netting shall be held in place using 11 gauge wire staples, geotextile pins or wooden stakes (BMP 4-07, "Geotextiles, Plastic Covers, and Erosion Control Blankets/Mats").
- Remove straw as necessary prior to permanent seeding or soil stabilization.

Maintenance and Inspection

- The key consideration in maintenance and inspection is that the straw needs to last long enough to achieve erosion control objectives.
- Reapplication of straw mulch and tackifier may be required to maintain effective soil stabilization over disturbed areas and slopes.
- After any rain event, inspect and maintain all slopes and straw mulch cover to prevent erosion.

Pictures

Straw mulch.

Corresponding CASQA Fact Sheet

Fact Sheet EC-6

What

This Erosion Control and Soil Stabilization BMP is a procedural BMP for the installation of specific erosion control soil stabilization materials to control erosion from wind and water. These materials consist of:

- Geotextile blankets/mats,
- Plastic covers, and
- Natural/man-made material erosion control blankets.

Geotextiles are permeable fabrics typically made from polypropylene (plastic) or polyester that have the ability to protect the soil from erosion but are able to allow some water to reach and to drain the soil. Geotextile fabrics come in three basic forms: woven, needle punched, or heat bonded. Geotextiles also allow controlled rate and filtered drainage from a slope for slope moisture control, while providing slope reinforcement and protection.

Plastic Covers, such as Visqueen, are essentially impermeable and are used for immediate, temporary protection.

Erosion control blankets/mats are meant to protect exposed soil from wind and rain impact and reduce the speed at which water moves across the soil surface. These blankets can be made out of straw, coconut fiber, aspen fiber, jute, and polypropylene. Permeability varies according to material and material weave.

When

- Use blankets/mats when disturbed soils, especially on moderate to steep slopes, are difficult to stabilize or access. Due to wildlife concerns, consult with your project Field Environmental Representative for any restrictions on using these products on your project.
- Geotextile blanket/mats should be used when slope reinforcement may be required.
- Geotextile blankets/mats and natural fiber blankets/mats (depending on their permeability) are used when it is important to allow some water to reach the soil for seed germination or allow slope drainage for moisture control.

Where

- Blankets and mats are generally not suitable for excessively rocky sites or areas where the final vegetation will be mowed (because staples and netting can catch in mowers).
- Plastic results in 100 percent runoff, therefore, their use is limited to:
  - Covering small stockpiles.
  - Covering small graded areas for short periods, such as through an imminent storm event, until alternative measures may be installed.
  - Note the CGP discourages the use of plastic materials for cover when more sustainable alternatives can be used.

Blankets/mats should be used where there are:

- Steep slopes, generally steeper than 1:3 (vertical: horizontal).
- Slopes where the erosion hazard is high.
- Slopes and disturbed soils where mulches would need to be anchored.
- Disturbed areas where plants are slow to develop adequate protective cover.
- Channels with high flows.
- Channels intended to be vegetated.
- Slopes adjacent to water bodies or ESAs).

How

For blankets or mat materials, proper site preparation is essential to ensure complete contact of the blanket or matting with the soil.

- Grade and shape the area of installation.

How (cont.)

- Remove all rocks, clods, vegetation or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
- Prepare seedbed by loosening of topsoil.
- Seed the area before blanket installation for erosion control and vegetation. Seeding after mat installation is often specified for turf reinforcement. When seeding prior to blanket installation, all check slots and other areas disturbed during installation must be re-seeded. Where soil filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.
- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Wire staples and metal stakes should be driven flush to the soil surface.
- All anchors should be 6 inches to 18 inches long and have sufficient ground penetration to resist pullout. Longer anchors may be required for loose soils.
- Installation on slopes – Consult the manufacturer's recommendations for installation. In general, these will be as follows:
  - Begin at the top of the slope and anchor the blanket in a 6 inch deep by 6 inch wide trench. Backfill trench and tamp earth firmly.
  - Unroll blanket down slope in the direction of water flow.
  - Overlap the edges of adjacent parallel rolls 2 inches to 3 inches and staple every 3 feet.
  - When blankets must be spliced, place blankets end over end (shingle style) with a 6 inch overlap. Staple through overlapped area, approximately 12 inches apart.
  - Lay blankets loosely and maintain direct contact with the soil. Do not stretch.
  - Staple blankets sufficiently to anchor blanket and maintain contact with the soil. Staples shall be placed down the center and staggered with the staples placed along the edges.
- Blankets and mats must be removed and disposed of prior to application of permanent soil stabilization measures.
- For plastic sheeting, it is important for the entire stockpile or exposed soil area to be covered completely, and the plastic firmly anchored with anchor objects spaced evenly along the entire perimeter so that wind, or storm water run-on, does not uncover the stockpile. Suitable anchors are gravel bags, sand bags, hay bales, or other non-polluting objects that can be safely handled.

Maintenance and Inspection

- Areas covered with temporary soil stabilization should be inspected routinely and before and after significant forecasted storm events. Any failures should be repaired immediately. Areas covered with temporary soil stabilization should be maintained to provide adequate erosion control. Temporary soil stabilization should be reapplied or replaced on exposed soils when greater than 10 percent of the previously covered area becomes exposed or exhibits visible erosion.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.

Pictures

Several types of erosion control blankets.

Corresponding CASQA Fact Sheet

Fact Sheet EC-7

What

Dust (Wind Erosion) control is a procedural BMP that consists of applying water or other dust suppressant to prevent or alleviate dust nuisance generated by construction and operations and maintenance activities.

When

- Dust control must be used whenever wind speed picks up dust and creates visual dust emissions. Dust control should be used at least initially on any project when exposed soil is subject to vehicle traffic and soil disturbance activities (e.g., dirt construction site, dirt access road traffic, grading, excavating, and soil stockpile generation, or soil removal from soil stockpiles).
- Dust control must be implemented in accordance with local air quality requirements.

Where

All construction and operations and maintenance activity sites where exposed soil is susceptible to wind erosion.

How

Use the following measures as applicable:

- Appropriate methods of applying dust control (water, chemical dust suppressant, or soil covers and the means to apply it) should be available for construction or operation and maintenance activity sites with the potential to create dust.
- Water applied for dust control should be applied evenly and in a manner that does not generate runoff.
- Dust control methods should be approved by the project Field Environmental Representative. A construction permit or an agency rule may require specific control procedures.
- Obtain prior approval to use any chemical dust suppressant from the project Field Environmental Representative. Dust suppressant chemicals must be on SDG&E's approved product list

- Non-potable water should not be conveyed in tanks or drainpipes that will be used to convey potable water, and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes and other conveyances should be marked **"NON-POTABLE WATER – DO NOT DRINK."** Approval for use of all non-potable sources of water must be obtained from the project Field Environmental Representative.
- If reclaimed wastewater is used for dust control, the sources and discharge must meet California Department of Health Services water reclamation criteria and RWQCB requirements. Approval for use of reclaimed wastewater must be obtained from the project Field Environmental Representative.

Maintenance and Inspection

- Check areas protected to ensure coverage.
- Reapply water, chemical dust suppressants, or maintain soil covers as necessary to maintain their effectiveness.

Pictures

Water being applied for dust control.

Corresponding CASQA Fact Sheet

Fact Sheet WE-1

What A diversion berm is a temporary berm of compacted soil used to direct runoff water to a desired location. A drainage swale is a shaped and sloped soil depression used to convey runoff to a desired location. Diversion berms and drainage swales divert off site runoff around the construction or operation and maintenance site, divert runoff from flowing onto stabilized areas and disturbed areas, and direct runoff into sediment basins or traps. A diversion berm or swale itself does not control erosion or remove or trap sediment from runoff.

Limitations:

- Diversion berms may create disturbed areas and become construction equipment barriers.
- Diversion berms must be stabilized immediately, adding cost and maintenance.
- Diverted storm water may cause downstream flood damage.
- Berms should not be constructed of easily eroded soils.
- Regrading the site to remove the berm may add cost.
- Other soil stabilization and sediment controls such as check dams, plastics, and blankets may be needed to prevent erosion in newly graded berms and swales.
- Sediment accumulation, scour depression, and/or persistent non-storm water discharges can result in standing water suitable for mosquito production.

When Diversion berms and drainage swales are suitable for use, individually or together, where runoff needs to be diverted from one area to another. These BMPs may be used:

- To direct runoff away from disturbed areas or at the top of slopes.
- To convey surface runoff down sloping land.
- To divert runoff towards a stabilized watercourse, drainage pipe, or channel.
- To intercept runoff from paved surfaces.
- To divert sediment laden runoff into sediment basins or traps.

Where Diversion berms and drainage swales should be considered:

- At the top of slopes to divert run-on from adjacent or undisturbed slopes.
- At bottom and mid-slopes to intercept sheet flow and convey concentrated flows.
- Below steep grades where runoff begins to concentrate.
- Along roadways and facility improvements subject to flood drainage.
- Berms should not be used for drainage areas greater than 10 acres or along slopes greater than 10 percent. For larger drainage areas, more permanent drainage structures should be built in accordance with local requirements.
- Drainage areas more than 5 acres should not drain to a temporary drainage swale. For larger drainage areas, use berms, or more permanent drainage structures should be built in accordance with local requirements.

How Berms and swales should not adversely affect adjacent properties and must conform to local floodplain management regulations. Obtain written authorization from property owner to divert runoff onto another property.

How (cont.)

- Care must be applied to correctly size and locate berms and drainage swales.
- Conveyances and outlets should be stabilized.
- Size to control flow velocity based on evaluation of the erosion risk, soil types, overtopping, flow backups, washout, and site drainage flow patterns.
- Install permanent berms and swales early in the construction process.

Diversion Berms:

- Compact all berms and provide positive drainage to an outlet.
- All berms should have 1:2 (vertical: horizontal) or flatter side slopes, and minimum 18-inch height, and minimum 24-inch top width. Wide top widths and flat slopes are usually needed for construction traffic crossings.
- Runoff should be conveyed to a sediment trapping device when the berm channel or the drainage area above the berm are not adequately stabilized.
- Temporary stabilization may be achieved using seed and mulching for slopes less than 5 percent and either riprap or sod for slopes greater than 5 percent. Stabilization should be completed immediately after installation/placement.
- If riprap is used to stabilize the channel formed along the toe of the berm, the following typical specifications apply:

Channel Grade	Riprap Stabilization
0.5 - 1%	4 inch Rock
1.1 - 2.0%	6 inch Rock
2.1 - 4.0%	8 inch Rock
4.1 - 5.0%	8 to 12 inch Riprap

- The riprap, recycled concrete, etc. should be pressed into the soil with construction equipment.
- Filter fabric may be used to cover berms in use for long periods.
- Construction activity on the earthen berms should be kept to a minimum.

Drainage Swales:

Standard engineering design criteria for small open channel and closed conveyance systems should be used. Unless local drainage design criteria state otherwise, drainage swales should be designed as follows:

- Place drainage swales above or below, not on, a cut or fill slope.
- Swale bottom width should be at least 2 feet, and the depth of the swale should be at least 18 inches. The swale side slopes should be 1:2 (vertical: horizontal) or flatter.
- Drainage swales should be at a grade of at least 1 percent, but not more than 15 percent.
- The swale must not be overtopped by the peak discharge from a 10-year storm, irrespective of the design criteria above.
- Remove all vegetation and other objectionable materials and compact the fill material along the swale path.

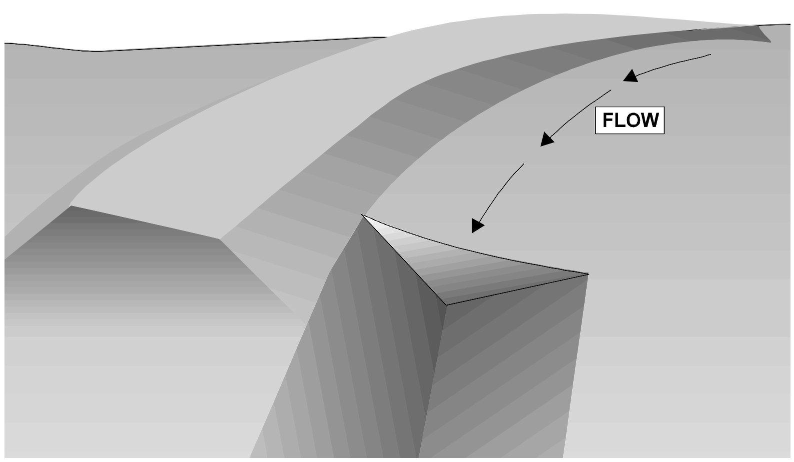
How (cont.)

- Stabilize all swales immediately after installation/placement. Seed and mulch swales with slopes of less than 5 percent and use riprap or sod for swales with slopes between 5 and 15 percent. For temporary swales, geotextiles and mats may provide immediate stabilization.
- Irrigation may be required to establish sufficient vegetation to prevent erosion.
- Do not operate vehicles across a swale unless a stabilized crossing is provided.
- Permanent drainage facilities must be designed by a California Registered Civil Engineer.
- At a minimum, the drainage swale should conform to predevelopment drainage patterns and capacities.
- Construct the drainage swale with a positive grade to a stabilized outlet.
- Provide erosion protection or energy dissipation measures if the flow out of the drainage swale can reach erosive velocity.

Maintenance and Inspection

- Inspect berms and drainage swales dams prior to, daily during, and after each storm event, and routinely throughout the construction activity (e.g., weekly, or in compliance with the frequency specified in the CGP, if applicable).
- Inspect BMPs subject to non-storm water discharges daily while the discharges occur.
- Inspect ditches and berms for washouts and erosion. Repair riprap, damaged linings, or soil stabilizers, and linings as needed.
- Inspect channel linings, embankments, and beds of swales and berms for erosion and accumulation of debris and sediment. Remove accumulated debris and sediment as needed. Removed sediment shall be incorporated in the project at appropriate locations or disposed of in accordance with federal, state and local requirements.
- Temporary conveyances should be completely removed as soon as the surrounding drainage area has stabilized or at the completion of construction.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet EC-9

What Velocity dissipation devices are composed of rock, riprap, grouted riprap or concrete rubble, placed at the outlet of a pipe, channel, or waterbar to prevent scour and erosion caused by concentrated high velocity flows. There are many types of dissipation devices.

Limitations:

- Large storms or high flows can wash away the outlet protection and leave the area susceptible to erosion.
- Sediment captured by the outlet protection may be difficult to remove without removing the protection.
- Outlet protection may negatively impact the channel habitat.
- Grouted riprap may break up in areas of freeze and thaw.
- With inadequate drainage, water may build up behind and break grouted riprap.
- Sediment accumulation, scour depression, and/or persistent non-storm water discharges can result in standing water suitable for mosquito production.

When Velocity dissipation devices are suitable when discharge velocities and energies at the outlets of culverts, conduits, waterbars, or channels are sufficient to erode the next downstream reach.

Where Velocity dissipation devices should be considered:

- At outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits, channels, waterbars, etc.
- At outlets located at the bottom of mild to steep slopes.
- At discharge outlets that carry continuous water flow.
- At outlets subject to short, intense water flows, such as flash floods.
- At points where lined conveyances discharge to unlined conveyances.

How Depth of flow, roughness, gradient, side slopes, discharge rate, and velocity should be considered in the outlet design. Compliance to local and state regulations should be considered, particularly while working in environmentally sensitive streambeds.

- Determine the apron length and rock size gradation using the discharge pipe diameter and estimated discharge rate table below. Select the longest apron length and largest rock size suggested by the pipe size and discharge rate. Recommendations for rock size and length of outlet protection mat should be considered minimums. Use sound, durable, and angular rock.
- Where flows are conveyed in open channels such as ditches or swales, use the estimated discharge rate for selecting the apron length and rock size. Flows should be the same as the culvert or channel design flow but never less than the pear 5 year flow for temporary structures planned for one rainy season, or the 10 year peak flow for temporary structures planned for two or three rainy seasons.
- Install filter fabric, riprap, grouted riprap, or concrete apron at selected outlet. Install filter fabric or well-graded filter layer beneath the riprap apron. Riprap aprons are best suited for temporary use during construction. Grouted or wired riprap can minimize maintenance.
- Rock outlet protection is usually less expensive and easier to install than concrete aprons or energy dissipaters, and serves to trap sediment and reduce flow velocities.

How (cont.)

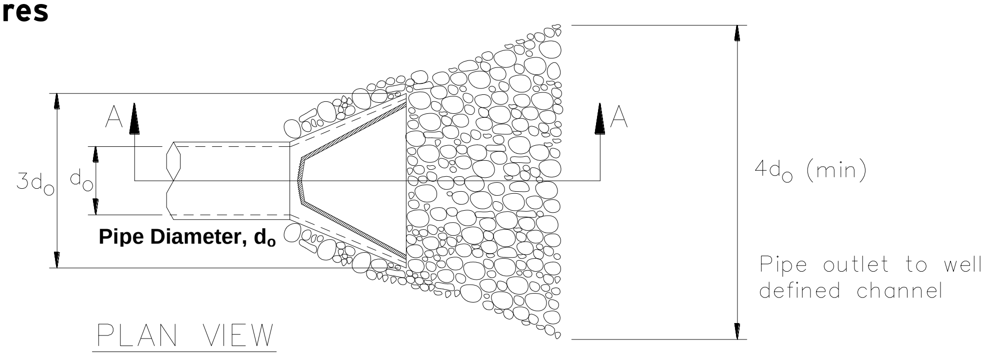
- Carefully place riprap to avoid damaging the underlying filter fabric.
  - Rock 4 to 6-inches may be carefully dumped onto the filter fabric from a maximum height of 12 inches.
  - 8- to 12-inch rock must be hand placed onto filter fabric, or the filter fabric may be covered with 4 inches of gravel, and the rock may be dumped from a maximum height of 16 inches.
  - Rock greater than 12 inches shall only be dumped onto filter fabric protected with a layer of gravel with a thickness equal to one-half the D_{50} rock size, with the dump height limited to twice the gravel protection layer thickness.
- Align apron with receiving stream and keep straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron.
- Outlets on slopes steeper than 10 percent should have additional protection.

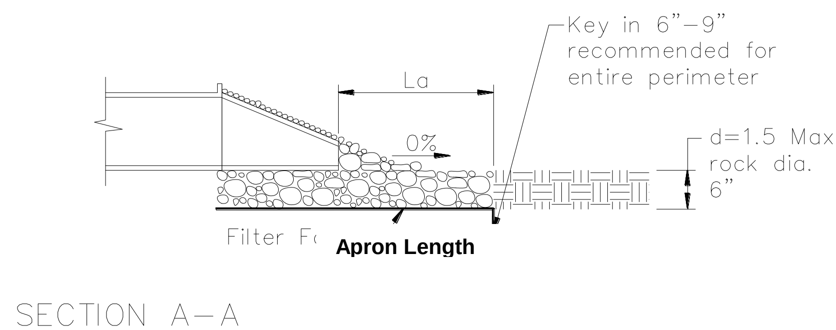
Pipe Diameter (in)	Discharge (ft^3/s)	Apron Length (ft)	Min. Riprap D_{50} Diameter (in)
12	5	10	4
	10	13	6
18	10	10	8
	20	16	12
	30	23	16
	40	26	8
24	30	16	8
	40	26	12
	50	26	16
	60	30	8

Maintenance and Inspection

- Inspect velocity dissipation devices prior to and after each rain event, and daily during extended rain events throughout the construction activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Inspect BMPs subject to non-storm water discharges daily while the discharges occur. Minimize standing water by removing sediment blockages and filling depressions.
- Inspect apron for displacement of the riprap and damage to the underlying fabric. Repair fabric and replace riprap that has washed away. If riprap continues to wash away, consider using larger material.
- Inspect for scour beneath the riprap and around the outlet. Repair damage to slopes or underlying filter fabric immediately.
- Temporary devices should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.

Pictures





Corresponding CASQA Fact Sheet

Fact Sheet EC-10

What

A slope drain is a pipe used to intercept and direct surface runoff or groundwater into a stabilized watercourse, trapping device, or stabilized area. Slope drains are typically used with diversion berms and drainage ditches to intercept and direct surface flow away from slope areas to protect cut or fill slopes. Slope drains prevent storm water from flowing directly down the slope by confining the runoff into an enclosed pipe or channel. The slope drain may be installed as a rigid pipe, such as corrugated metal, a flexible conduit, or a lined terrace drain with a top of a slope inlet and a bottom of a slope outlet.

Limitations:

- Slope drain sizing, installation, and maintenance is critical to minimize the potential for failure. Severe erosion may result when slope drains fail by overtopping, pipe separation, or other signs of erosion.
- Dissipation of high flow velocities at the pipe outlet is required to avoid erosion.
- Sediment accumulation, scour depression, and/or persistent non-storm water discharges can result in standing water suitable for mosquito production.

When

Slope drains are suitable when:

- Concentrated runoff flow must be conveyed down a slope.
- Drainage is needed for top of slope diversion dikes or swales.
- Drainage is needed for top of cut and fill slopes where water can accumulate.
- Emergency spillway is required for a sediment basin.

Where

Slope drains should be considered where:

- The drainage area is less than 10 acres per slope drain. For larger areas, use a rock-lined channel, or subdivide into areas of 10 acres or less, with each area is treated as a separate drainage.
- Drainage areas exceeding 10 acres must be designed by a California Registered Civil Engineer and approved by the agency that issued the grading permit.

How

- Permanent structures included in the project plans can often serve as construction BMPs if implemented early. However, the permanent structure must meet or exceed the criteria for the temporary structure.
- Slope drains and inlets must be securely attached to the slope and must be adequately sized to carry the capacity of the design storm and associated forces.
- Outlets must be stabilized with riprap, concrete, or other type of energy dissipater, or directed into a stable sediment trap or basin.
- Debris racks are recommended at the inlet. Debris racks are barriers used to collect debris that is too large to pass through the inlet. Debris racks located several feet upstream of the inlet can usually be larger than racks at the inlet, and thus provide enhanced debris protection and less plugging.

How (cont.)

- Safety racks are also recommended at the inlet and outlet of pipes to prevent a human body or animal from washing into the pipe and/or becoming trapped.
- Size to convey at least the peak flow of a 10-year storm. The design storm is conservative due to the potential impact of system failures. The pipe size may be computed using the Rational Method or a method established by a local municipality. Higher flows must be safely stored or routed to prevent any offsite concentration of flow or erosion.Maximum slope generally limited to 1:2 (vertical: horizontal) as energy dissipation below steeper slopes is difficult.
- Direct surface runoff to slope drains with interceptor dikes. Top of interceptor dikes should be 12 inches higher than the top of the slope drain.
- Slope drains can be placed on or buried beneath the slope surface.
- As a guide, temporary slope drains should not be sized smaller than shown in the following table:

Minimum Pipe Diameter (inches)	Maximum Drainage Area (Acres)
12	1.0
18	3.0
21	5.0
24	7.0
30	10.0

- Recommended materials include metal, plastic, or concrete pipe, either corrugated or smooth wall. The following types of slope drains are common:
  - Rigid Pipe: Also known as a pipe drop, the pipe usually consists of corrugated metal pipe or rigid plastic pipe. The pipe is placed on undisturbed or compacted soil and secured to the slope surface or buried in a trench. Concrete thrust blocks must be used when warranted by the calculated thrust forces. Collars should be properly installed and secured with straps or watertight collars.
  - Flexible Pipe: The pipe consists of a flexible tube of heavy duty plastic, rubber, or composite material. The tube material is securely anchored to the slope surface. The tube should be securely fastened to the metal inlet and outlet conduit sections with metal straps or watertight collars.
  - Section Downdrains: The section downdrain consists of a pre-fabricated, section conduit of half round or third round material, and performs similar to a flume or chute. The pipe must be placed on undisturbed or compacted soil and secured into the slope.
  - Concrete-Lined Terrace Drain: This concrete channel drains water from a slope terrace to the next level. These drains are typically specified as permanent structures and should be designed according to local criteria. If installed early, they can be construction slope drains.

How (cont.)

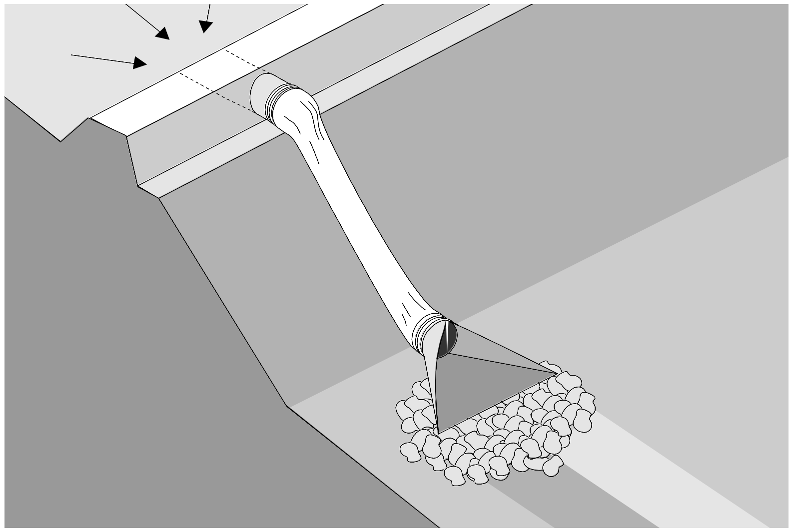
When installing slope drains:

- Install perpendicular to slope contours.
- Compact soil around and under entrance, outlet, and along length of pipe.
- Securely anchor and stabilize pipe appurtenances into soil.
- Check to ensure that pipe connections are watertight.
- Protect areas around inlet with filter fabric. A flared end section installed at the inlet will improve flow into the slope drain and prevent erosion at the pipe entrance. Use a flared section with a 6-inch minimum toe plate to help prevent undercutting. The flared section should slope towards the pipe inlet.
- Protect outlet with riprap or other energy dissipation device. Protect outlet of slope drains using a flared end section when outlet discharges to a flexible energy dissipation device.

Maintenance and Inspection

- Inspect slope drains prior to and after each storm event, and daily during extended rain events throughout the construction activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Inspect BMPs subject to non-storm water discharges daily while the discharges occur. Minimize standing water by removing sediment blockages and filling depressions.
- Inspect outlet for erosion and downstream scour. If eroded, repair damage and install additional energy dissipation measures. If downstream scour is occurring, it may be necessary to reduce flows being discharged into the channel unless other preventative measures are implemented.
- Insert inlet for clogging or undercutting. Remove debris from inlet to maintain flows. Repair undercutting at inlet, and if needed, install flared section or riprap around the inlet to prevent further undercutting.
- Inspect pipes for leakage. Repair leaks and restore damaged slopes.
- Inspect slope drainage for accumulations of debris and sediment. Remove sediment from entrances and outlets as required. Flush drains as necessary; capture and settle out sediment from discharge.
- Ensure water is not ponding onto inappropriate areas (e.g. active traffic lanes, material storage areas, etc.).
- Pipe anchors must be checked to ensure that the pipe remains anchored to the slope. Install additional anchors if pipe movement is detected.

Pictures



Corresponding CASQA Fact Sheet

Fact Sheet EC-11

What

Streambank stabilization includes measures to reduce the discharge of sediment from streambanks with exposed or disturbed soil, or unstable banks. Streambank stabilization measures include preservation of existing vegetation, hydraulic mulch, hydroseeding, soil binders, straw mulch, geotextiles and mats, berms, and drainage swales, velocity dissipation devices, and slope drains. Streambank sediment controls include silt fences, fiber rolls, gravel bag berms, rock filters, and K-rail barriers, and padding. Each of these measures have different applications, limitations, and maintenance requirements for use as streambank stabilization.

Stream channels, streambanks, and associated riparian areas are dynamic and sensitive ecosystems that respond to changes in land use. Streams on the 303(d) list and listed for sediment may require numerous measures to prevent any increases in sediment load to the stream.

General streambank stabilization limitations:

IMPORTANT POINT

- **Specific permit requirements or mitigation measures such as RWQCB 401 Certification, U.S. Army Corps of Engineers 404 permit and approval by the California Department of Fish and Game supersede the guidance in this BMP.**
- If numerical water quality standards are mentioned in any of these and other related permits, testing and sampling may be required. Soil disturbance activities in watersheds having streams listed as 303(d) impaired for sediment, silt, or turbidity, may require sampling to verify that there is no net increase in sediment load.

When

When construction or operations and maintenance activities occur within stream channels and associated riparian areas.

Where

Streambank stabilization procedures apply to all construction projects and operations and maintenance activities that disturb or occur within stream channels and their associated riparian areas.

How

Planning should account for: scheduling; avoidance of wet in-stream construction; minimizing disturbance and construction time period; selecting crossing location; and selecting equipment.

IMPORTANT POINT

- **Construction and operation and maintenance activities should be scheduled according to the relative sensitivity of the environmental concerns and will be different when working near perennial streams vs. ephemeral streams.**
- Minimize disturbance by using pre-disturbed areas, selecting the narrowest crossing location, limiting vehicle crossing trips, and minimizing the number and size of work areas. Plan work areas at least 50 feet from the stream channel.
- Avoid steep and unstable banks, highly erodible or saturated soils, or highly fractured rock.
- Select a project or work site that minimizes disturbance to aquatic species or habitat.
- Select equipment that reduces the amount of pressure exerted on the ground surface (less than 5 or 6 pounds per square inch where possible.

Maintenance and Inspection

- Inspect streambank stabilization BMPS prior to and after each storm event, and daily during extended rain events throughout the construction activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Inspect BMPs subject to non-storm water discharges daily while the discharges occur.
- Inspect and repair equipment (for damaged hoses, fittings, and gaskets, etc.).

Pictures

Cobble or gravel armor used for streambank stabilization.

Corresponding CASQA Fact Sheet

Fact Sheet EC-12

What Soil preparation/roughening involves assessment and preparation of surface soils for BMP installation. This includes soil testing (for seed base, soil characteristics, or nutrients), or roughening surface soils by mechanical methods (including sheepsfoot rolling, track walking, scarifying, stair stepping, and imprinting) to prepare soils for additional BMPs or to break up sheet flow. Soil preparation can also involve tilling topsoil to prepare a seed bed and/or incorporation of soil amendments to enhance vegetative establishment. Various roughening techniques on slopes can result in a significant erosion reduction as compared to smooth slopes.

Limitations:

- Preparation and roughening must take place prior to installing other erosion controls (such as hydraulically applied stabilizers) or sediment controls (such as fiber rolls) on slope faces.
- In cases where slope preparation is minimal, erosion control/revegetation BMPs that do not require extensive soil preparation (such as hydraulic mulching and seeding applications) should be employed.
- Consideration should be given to the type of erosion control BMP that follows surface preparation, as some BMPs are not designed to be installed over various types of tillage/roughening.

When

- Soil preparation is most effective when used in combination with erosion controls. Soil preparation (i.e. tilling, raking, and amendment) is essential to proper vegetative establishment, and suitable in combination with any soil stabilization method, including rolled erosion control products (RECPs) or sod.
- Soil roughening is suitable for use as a complementary process to soil preparation for controlling erosion, and is not intended to be used as a stand-alone BMP. Soil roughening should be used with perimeter controls, additional erosion control measures, grade breaks, and vegetative establishment for maximum effectiveness. Soil roughening is referred to as track walking (sometimes called imprinting) a slope, where treads from heavy equipment run parallel to the slope contours and create terraces. Roughening is intended to only affect surface soils and should not compromise slope stability or overall compaction.

Where Soil preparation should be considered:

- Where vegetation is desired.

Soil roughening should be considered:

- Along any disturbed slopes, including temporary stockpiles, sediment basins, or compacted soil diversion berms and swales.
- Roughening should be used in combination with hydraulically applied stabilization methods, compost blankets, or straw mulch; but should <u>not</u> be used in combination with RECPs or sod because roughening is intended to leave terraces on the slope.

How Minimal materials are required unless amendments and/or seed are added to the soil. Most soil roughening/preparation can be done with standard construction equipment.

How (cont.)

Soil Preparation

- Where appropriate, soil should be prepared to receive the seed by disking or scarifying the surface to eliminate crust, improve air and water infiltration and create a more favorable environment for germination and growth.
- Based on soil testing, apply additional soil amendments (e.g. fertilizers, additional seed) to the soil to help with germination.

Cut Slope Roughening

- Stair-step grade or groove the cut slopes steeper than 1:3 (vertical: horizontal).
- Use stair-step grading on any erodible material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with some subsoil are well suited to stair-step grading.
- Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the "step" in toward the vertical wall.
- Do not make individual vertical cuts more than 2 feet or 3 feet high in soft or rock materials, respectively.
- Groove the slope using machinery to create a series of ridges and depressions that run across the slope on the contour.

Fill Slope Roughening

- Place on fill slopes with inclinations steeper than 1:3 (vertical: horizontal) in lifts not to exceed 8 inches, and ensure that each lift is properly compacted.
- Ensure that the slope face consists of loose, uncompacted fill 4 to 6 inches deep.
- Use grooving or tracking to roughen the face of slopes, if necessary.
- Do not blade or scrape the final slope face.

Roughening for Slopes to be Mowed

- Slopes which require mowing should be flatter than 1:3 (vertical: horizontal).
- Roughen these areas to shallow grooves by track walking, scarifying, sheepsfoot rolling, or imprinting. Excessive roughness is undesirable when mowing is planned.
- Space grooves less than 10 inches apart, and not less than 1 inch deep, and perpendicular to the direction of runoff (parallel to the slope contours).

Roughening with Tracked Machinery

- Limit roughening with tracked machinery to soils with a sandy textural component to avoid undue compaction of the soil surface.
- Operate tracked machinery up and down the slope to leave horizontal depressions in the soil. Do not back-blade during the final grading operation.

How (cont.)

- Seed and mulch roughened areas as soon as possible to obtain optimum seed germination and growth.

Maintenance and Inspection

- Inspect BMPs prior to and after each storm event, and daily during extended rain events throughout the construction activity (e.g., weekly, or in compliance with the frequency specified in the project specific SWPPP, if applicable). Initiate repairs related to a storm event within 72 hours of identifying the problem or as soon as possible but prior to the next predicted storm event, per the CGP.
- Check the seeded slopes for signs of erosion such as rills and gullies. Fill these areas slightly above original grade, then reseed and mulch as soon as possible.

Pictures

Sheepsfoot used for soil preparation

Corresponding CASQA Fact Sheet

Fact Sheet EC-15

REFERENCES

CASQA, 2009. California Stormwater Quality Association Stormwater Best Management Practice Handbook Portal: Construction, November 2009. https://www.casqa.org.

Sempra Energy, December 2002. Water Quality Construction Best Management Practices Manual.

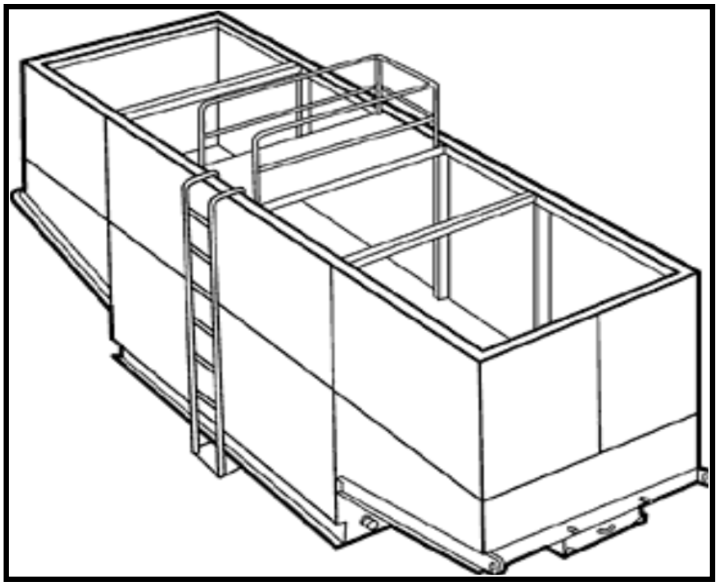
APPENDIX A DEFINITIONS AND ACRONYMS

ATS	Active Treatment Systems
Base	Construction and Operations Center
BFM	Bonded Fiber Matrix
BMP	Best Management Practices
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CGP	California Construction General Permit
ES	Environmental Standard
ESA	Environmentally Sensitive Area
gpm	Gallons per minute
lb/acre	Pounds per acre
LID	Low Impact Development
NPDES	National Pollutant Discharge Elimination System
RWQCB	Regional Water Quality Control Board – there are nine Water Boards located throughout California that are responsible for enforcing water quality standards within their individual boundaries.
SDG&E	San Diego Gas & Electric
SUSMP	Standard Urban Storm Water Mitigation Plan
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board – The State Board is responsible for protecting and preserving water quality and water rights in California.
Watershed	The total land area that contributes water to a river, stream, lake, or other body of water. Synonymous with drainage basin.
WDR	Waste Discharge Requirements

NOTES

NOTES

CALIFORNIA STORMWATER QUALITY ASSOCIATION DEWATERING OPERATIONS BEST MANAGEMENT PRACTICES



Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

SE-5: Fiber Roll

SE-6: Gravel Bag Berm

Description and Purpose

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation (stormwater) must be removed from a work location to proceed with construction work or to provide vector control.

The General Permit incorporates Numeric Action Levels (NAL) for turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Discharges from dewatering operations can contain high levels of fine sediment that, if not properly treated, could lead to exceedances of the General Permit requirements or Basin Plan standards.

The dewatering operations described in this fact sheet are not Active Treatment Systems (ATS) and do not include the use of chemical coagulations, chemical flocculation or electrocoagulation.

Suitable Applications

These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area to facilitate construction.

Practices identified in this section are also appropriate for implementation when managing the removal of accumulated precipitation (stormwater) from depressed areas at a construction site.

Stormwater mixed with non-stormwater should be managed as non-stormwater.

Limitations

- Dewatering operations will require, and should comply with applicable local and project-specific permits and regulations. In some areas, all dewatering activities, regardless of the discharge volume, require a dewatering permit.
- Site conditions will dictate design and use of dewatering operations.
- The controls discussed in this fact sheet primarily address sediment. Other secondary pollutant removal benefits are discussed where applicable.
- The controls detailed in this fact sheet only allow for minimal settling time for sediment particles. Use only when site conditions restrict the use of the other control methods.
- Avoid dewatering discharges where possible by using the water for dust control.

Implementation

- A Construction Site Monitoring Plan (CSMP) should be included in the project Stormwater Pollution Prevention Plan (SWPPP).
- Regional Water Quality Control Board (RWQCB) Regions may require notification and approval prior to any discharge of water from construction sites.
- The destination of discharge from dewatering activities will typically determine the type of permit required for the discharge. For example, when discharging to a water of the U.S., a dewatering permit may be required through the site's governing RWQCB. When discharging to a sanitary sewer or Municipal Separate Storm Sewer System (MS4), a permit may need to be obtained from the owner of the sanitary sewer or MS4 in addition to obtaining an RWQCB dewatering permit. Additional permits or permissions from other agencies may be required for dewatering cofferdams or diversions.
- Dewatering discharges should not cause erosion at the discharge point. Appropriate BMPs should be implemented to maintain compliance with all applicable permits.
- Maintain dewatering records in accordance with all local and project-specific permits and regulations.

Sediment Treatment

A variety of methods can be used to treat water during dewatering operations. Several devices are presented below and provide options to achieve sediment removal. The sediment particle size and permit or receiving water limitations on sediment or turbidity are key considerations for selecting sediment treatment option(s); in some cases, the use of multiple devices may be appropriate. Use of other enhanced treatment methods (i.e., introduction of chemicals or electric current to enhance flocculation and removal of sediment) must comply with: 1) for storm drain or surface water discharges, the requirements for Active Treatment Systems (see SE-11); or 2) for sanitary sewer discharges, the requirements of applicable sanitary sewer discharge permits.

Sediment Basin (see also SE-2)

Description:

- A sediment basin is a temporary basin with a controlled release structure that is formed by excavation or construction of an embankment to detain sediment-laden runoff and allow sediment to settle out before discharging. Sediment basins are generally larger than Sediment Traps (SE-3) and have a designed outlet structure.

Appropriate Applications:

- Effective for the removal of trash, gravel, sand, silt, some metals that settle out with the sediment.

Implementation:

- Excavation and construction of related facilities is required.
- Temporary sediment basins should be fenced if safety is a concern.
- Outlet protection is required to prevent erosion at the outfall location.

Maintenance:

- Maintenance is required for safety fencing, vegetation, embankment, inlet and outlet, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-third.

Sediment Trap (See also SE-3)

Description:

- A sediment trap is a temporary basin formed by excavation and/or construction of an earthen embankment across a waterway or low drainage area to detain sediment-laden runoff and allow sediment to settle out before discharging. Sediment traps are generally smaller than Sediment Basins (SE-2) and do not have a designed outlet (but do have a spillway or overflow).

Appropriate Applications:

Effective for the removal of large and medium sized particles (sand and gravel) and some metals that settle out with the sediment.

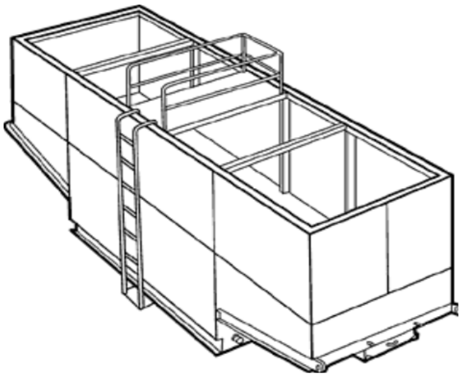
Implementation:

- Excavation and construction of related facilities is required.
- Trap inlets should be located to maximize the travel distance to the trap outlet.
- Use rock or vegetation to protect the trap outlets against erosion.

Maintenance:

- Maintenance is required for vegetation, embankment, inlet and outfall structures, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-third.

Weir Tanks



Description:

- A weir tank separates water and waste by using weirs. The configuration of the weirs (over and under weirs) maximizes the residence time in the tank and determines the waste to be removed from the water, such as oil, grease, and sediments.

Appropriate Applications:

- The tank removes trash, some settleable solids (gravel, sand, and silt), some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.

- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors should be consulted to appropriately size tank.

- Treatment capacity (i.e., volume and number of tanks) should provide at a minimum the required volume for discrete particle settling for treatment design flows.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.

- Oil and grease disposal should be conducted by a licensed waste disposal company.

Dewatering Tanks

Description:

- A dewatering tank removes debris and sediment. Flow enters the tank through the top, passes through a fabric filter, and is discharged through the bottom of the tank. The filter separates the solids from the liquids.

Appropriate Applications:

- The tank removes trash, gravel, sand, and silt, some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.

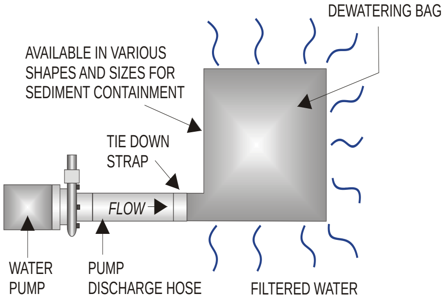
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors should be consulted to appropriately size tank.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.

- Oil and grease disposal should be conducted by licensed waste disposal company.

Gravity Bag Filter



Description:

- A gravity bag filter, also referred to as a dewatering bag, is a square or rectangular bag made of non-woven geotextile fabric that collects gravel, sand, silt, and fines.

Appropriate Applications:

- Effective for the removal of sediments (gravel, sand, silt, and fines). Some metals are removed with the sediment.

Implementation:

- Water is pumped into one side of the bag and seeps through the top, bottom, and sides of the bag.

- Place filter bag on pavement or a gravel bed or paved surface. Avoid placing a dewatering bag on unprotected bare soil. If placing the bag on bare soil is unavoidable, a secondary barrier should be used, such as a rock filter bed placed beneath and beyond the edges of the bag to, prevent erosion and capture sediments that escape the bag.

- Perimeter control around the downstream end of the bag should be implemented. Secondary sediment controls are important especially in the initial stages of discharge, which tend to allow fines to pass through the bag.

Maintenance:

- Inspection of the flow conditions, bag condition, bag capacity, and the secondary barrier (as applicable) is required.

- Replace the bag when it no longer filters sediment or passes water at a reasonable rate.

- Caution should be taken when removing and disposing of the bag, to prevent the release of captured sediment

- Properly dispose of the bag offsite. If sediment is removed from the bag prior to disposal (bags can potentially be reused depending upon their condition), dispose of sediment in accordance with the general maintenance procedures described at the end of this BMP Fact Sheet.

Sand Media Particulate Filter

Description:

- Water is treated by passing it through canisters filled with sand media. Generally, sand filters provide a final level of treatment. They are often used as a secondary or higher level of treatment after a significant amount of sediment and other pollutants have been removed using other methods.

Appropriate Applications:

- Effective for the removal of trash, gravel, sand, and silt and some metals, as well as the reduction of biochemical oxygen demand (BOD) and turbidity.
- Sand filters can be used for stand-alone treatment or in conjunction with bag and cartridge filtration if further treatment is required.
- Sand filters can also be used to provide additional treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filters require regular service to monitor and maintain the level of the sand media. If subjected to high loading rates, filters can plug quickly.
- Venders generally provide data on maximum head loss through the filter. The filter should be monitored daily while in use, and cleaned when head loss reaches target levels.
- If cleaned by backwashing, the backwash water may need to be hauled away for disposal, or returned to the upper end of the treatment train for another pass through the series of dewatering BMPs.

Pressurized Bag Filter

Description:

- A pressurized bag filter is a unit composed of single filter bags made from polyester felt material. The water filters through the unit and is discharged through a header. Vendors provide bag filters in a variety of configurations. Some units include a combination of bag filters and cartridge filters for enhanced contaminant removal.

Appropriate Applications:

- Effective for the removal of sediment (sand and silt) and some metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Oil absorbent bags are available for hydrocarbon removal.

- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filter bags require replacement when the pressure differential equals or exceeds the manufacturer's recommendation.

Cartridge Filter

Description:

- Cartridge filters provide a high degree of pollutant removal by utilizing a number of individual cartridges as part of a larger filtering unit. They are often used as a secondary or higher (polishing) level of treatment after a significant amount of sediment and other pollutants are removed. Units come with various cartridge configurations (for use in series with bag filters) or with a larger single cartridge filtration unit (with multiple filters within).

Appropriate Applications:

- Effective for the removal of sediment (sand, silt, and some clays) and metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Hydrocarbons can effectively be removed with special resin cartridges.

- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance.

Maintenance:

- The cartridges require replacement when the pressure differential equals or exceeds the manufacturer's recommendation.

Costs

- Sediment control costs vary considerably depending on the dewatering and sediment treatment system that is selected. Pressurized filters tend to be more expensive than gravity settling, but are often more effective. Simple tanks are generally rented on a long-term basis (one or more months) and can range from $360 per month for a 1,000 gallon tank to $2,660 per month for a 10,000 gallon tank. Mobilization and demobilization costs vary considerably.

Inspection and Maintenance

- Inspect and verify that dewatering BMPs are in place and functioning prior to the commencement of activities requiring dewatering.

- Inspect dewatering BMPs daily while dewatering activities are being conducted.

- Inspect all equipment before use. Monitor dewatering operations to ensure they do not cause offsite discharge or erosion.
- Sample dewatering discharges as required by the General Permit.
- Unit-specific maintenance requirements are included with the description of each unit.
- Sediment removed during the maintenance of a dewatering device may be either spread onsite and stabilized, or disposed of at a disposal site as approved by the owner.
- Sediment that is commingled with other pollutants should be disposed of in accordance with all applicable laws and regulations and as approved by the owner.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003; Updated March 2004.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Labor Surcharge & Equipment Rental Rates, April 1, 2002 through March 31, 2003, California Department of Transportation (Caltrans).

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

APPENDIX VII:

BMP INFORMATION

The Qualified Storm Water Pollution Prevention Plan Practitioner Implementation Checklist will be included upon completion.

BMP SELECTION WORKSHEET
(Store Completed Forms in Appendix VII)

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs	Option 1	Option 2
Section 1 Sediment Controls				
BMP-1-02	Silt Fence	☒	*_*_*	-SF-
BMP-1-03	Fiber Rolls	☒	- - -	-FR-
BMP-1-04	Gravel Bag Berm	☒	○○○	~GBB~
BMP-1-05	Sand Bag Barrier	☐	●●●	-SBB-
BMP-1-06	Storm Drain Inlet Protection	☐	□	-SDIP-
BMP-1-07	Tracking Controls	☒	■	-TC-
BMP-1-08	Stockpile Management	☐	◊	-SM-
Other – User Defined	BMP Description	☐		
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		
Section 2 Waste Management and Material Controls				
BMP-2-01	Material Delivery and Storage	☒	»»»»»	-MDS-
BMP-2-02	Material Use	☐	☼	-MV-
BMP-2-03	Spill Control	☐		-SC-
BMP-2-04	Solid Waste Management	☐	○-○-○	-SWM-

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs	Option 1	Option 2
BMP-2-05	Hazardous Materials/Waste Management	☐		-HM/WM-
BMP-2-06	Contaminated Soil Management	☐		-CSM-
BMP-2-07	Sanitary/Septic Waste Management	☐	▲	-S/SWM-
BMP-2-08	Liquid Waste Management	☐	△	-LWM-
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		
Section 3 Non-Storm Water Discharge Controls				
BMP-3-01	Dewatering Operations	☐	☆	-DW-
BMP-3-02	Paving Operations	☐	●-●-●	-PO-
BMP-3-03	Vehicle and Equipment Washing	☐	⬠	-VEW-
BMP-3-04	Vehicle and Equipment Fueling	☐		-VEF-
BMP-3-05	Concrete/Coring/Saw Cutting and Drilling Waste Management	☒	⊗	-CWM-
BMP-3-06	Dewatering Utility Substructures and Vaults	☐	▶	-DUS&V-
BMP-3-07	Vegetation Management including Mechanical and Chemical Weed Control	☐		-VM-
BMP-3-08	Over-Water Protection	☐		-OWP-
BMP-3-09	Removal of Utility Location/Mark-Out Paint	☐		-UL-
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs	Option 1	Option 2
NS-2	Dewatering Operations	☒	☆	-DW-
Section 4 Erosion Control and Soil Stabilization				
BMP-4-01	Preservation of Existing Vegetation	☐	▼	-PEV-
BMP-4-02	Temporary Soil Stabilization	☐	■-■-■	-TSS-
BMP-4-03	Hydraulic Mulch	☐	≈≈≈≈	-M-
BMP-4-04	Hydroseeding	☐	>>>>	-BP-
BMP-4-05	Soil Binders	☐	¬¬¬¬	-SOS-
BMP-4-06	Straw Mulch	☐	««««	-S-
BMP-4-07	Geotextiles, Plastic Covers and Erosion Control Blankets/Mats	☐	¤¤¤¤	-ECB-
BMP-4-08	Dust (Wind Erosion) Control	☐	....	-WE-
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		

BMP No.	BMP Options (Additional BMPs shall be implemented as necessary to protect water quality as determined by field conditions)	Selected BMPs	Option 1	Option 2
Section 5 Streambed Discharges and Crossings				
CASQA EC-10	Velocity Dissipation Devices	☐	≡≡≡≡	-VDD-
CASQA EC-12	Streambank Stabilization	☐	~~~~	-SBS-
CASQA NS-4	Temporary Stream Crossing	☐	<<<<	-TSC-
CASQA NS-5	Clear Water Diversion	☐	+++++	-CWD-
The following rows have been provided to add additional BMPs that may be required during the course of the project. QSD to provide this information as applicable.				
Other – User Defined	BMP Description:	☐		

The Best Management Practice Site Map is included in Appendix III: Site Maps and Drawings.

The Final Landscaping and Site Stabilization Best Management Practices will be included upon approval of the Conceptual Landscape Plan.

APPENDIX VIII:

REAPS

Rain Event Action Plans are not applicable for Risk Level 1 projects.

APPENDIX IX:

SITE INSPECTION RECORDS

Site Inspection Records will be included upon completion.

APPENDIX X:

CONSTRUCTION SITE MONITORING PROGRAM (CSMP)

APPENDIX X
CONSTRUCTION SITE MONITORING PROGRAM (CSMP) FOR RISK LEVEL 1 PROJECTS

1. OVERVIEW

This appendix contains the Construction Site Monitoring Program (CSMP) and includes the required monitoring procedures and instructions, location maps, forms and checklists.

The purpose of this program is to:

- Demonstrate that the site is in compliance with the Discharge Prohibitions;
- Determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
- Determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and
- Determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

This CSMP is comprised of both visual inspection and sampling components that are specified in the SWRCB's Stormwater Construction General Permit, Order 2009-0009-DWQ (CGP).

A Qualified SWPPP Developer (QSD) has prepared this CSMP and shall revise it as necessary to reflect project revisions and whenever there is a change of ownership for all or any portion of the construction site prior to completion or final stabilization.

The Qualified SWPPP Practitioner (QSP) is responsible for implementing the CSMP either directly or through the supervision of trained personnel. The personnel responsible for preparing, maintaining and implementing this CSMP are identified in Appendix XIII.

2. VISUAL OBSERVATION (INSPECTION) REQUIREMENTS

The visual observations (inspections) described in this CSMP are specific to sampling events and are separate from the Site Inspections described in Section 4.7 of this SWPPP.

A. Visual Monitoring (Inspections) for Qualifying Rain Events (QREs)

Visual inspections shall be performed before and after a QRE which is defined as any rain event producing ½ inch or more of precipitation with a 48 hour or greater period between rain events. A blank "Visual Observation (Inspection) for a QRE" form is provided in Appendix I. The QSP must complete this form during each visual inspection and insert the completed copy in Appendix XI.F. See Section 12 (CSMP) for record-keeping requirements.

Appendix XI.H contains a description of the locations where visual inspections for QREs shall be conducted.

For Each QRE:

- Record the time, date and rain gauge reading.
- Conduct inspections only during business hours (business hours are anytime work is being conducted on the site, including weekends and night-time, as applicable).
- **Before** each QRE (i.e., within 2 business days (48 hours)):
    - **Storm Water:**
        - Inspect all storm water drainage areas for:
            - Spills, leaks or uncontrolled pollutant sources and implement any needed corrective actions;
            - The presence or absence of:
                - Floating and suspended materials;
                - A sheen on the surface;
                - Discolorations;
                - Turbidity;
                - Odors; and
                - Sources of any observed pollutants.
    - **BMPs:**
        - Inspect all BMPs for proper implementation in accordance with the SWPPP and implement appropriate corrective actions;
        - Observe any storm water storage and containment areas for:
            - Leaks and to ensure maintenance of adequate freeboard;
            - The presence or absence of:
                - Floating and suspended materials;
                - A sheen on the surface;
                - Discolorations;
                - Turbidity;
                - Odors; and
                - Sources of any observed pollutants.

- **After** each QRE:
  - **Storm Water**:
    - Within 2 business days (48 hours), observe storm water discharges at all discharge locations; and
    - At the time of discharge, visually inspect the discharge of stored or contained storm water that is derived from and discharged subsequent to a QRE producing precipitation of ½ inch or more.
      - ♦ Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation, shall be inspected prior to its discharge during operating hours.
  - **BMPs:**
    - Within 2 business days (48 hours):
      - ♦ Inspect whether BMPs were adequately designed, implemented, and effective; and
      - ♦ Identify additional BMPs and revise the SWPPP accordingly.

On-site records for each visual inspection shall be retained that contain the following information:

- Personnel performing the inspections;
- Inspection date;
- Weather conditions;
- Locations inspected; and
- Corrective actions taken in response to the observations.

B. Visual Observations (Inspections) for Non-Storm Water Discharges

Visual inspections of non-storm water discharges shall be performed quarterly. A blank "Visual Observation (Inspection) Form for Non-Storm Water Discharges" form is provided in Appendix I. The QSP must complete these forms during the visual inspection and insert a completed copy in Appendix XI.F. Visual inspections shall be conducted during daylight hours (i.e., sunrise to sunset).

Appendix XI.H contains a description of the locations where visual inspections for QREs shall be conducted.

The QSP:

- Shall visually inspect each drainage area for:
  - The presence of (or indications of prior) unauthorized and authorized non-storm water discharges; and
  - Their sources.

- Shall conduct one visual inspection quarterly in each of the following periods:
  - January- March;
  - April-June;
  - July-September; and
  - October-December.

- Shall ensure that visual inspections document the:
  - Presence or evidence of any non-stormwater discharge (authorized or unauthorized);
  - Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.); and
  - Source of the pollutants.

- Shall maintain on-site records indicating the:
  - Personnel performing the visual inspections;
  - Dates and approximate times each drainage area and non-stormwater discharge was observed; and
  - Response taken to:
    - Eliminate unauthorized non-storm water discharges; and
    - Reduce or prevent pollutants from contacting non-storm water discharges.

C. Exemptions for Visual Observations (Inspections)

Visual inspections are not required under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours (business hours are anytime work is being conducted on the site, including weekends and night-time, as applicable).

If one of these conditions occurs, document why the inspection did not occur in the SWPPP and include the information in the Annual Report. A blank “Sampling Event Worksheet” Form has been provided in Appendix I. Keep a copy of the completed form in Attachment XI.B.

3. WATER QUALITY SAMPLING AND ANALYSIS

Sampling and analysis is required for site effluents.

This Project is a Risk Level 1. The CGP requires samples of the following effluents:

- Non-visible pollutant discharges, including:
  - Any parameters (if applicable) indicating the presence of pollutants identified

in the list of potential pollutant sources listed in Appendix V;

- o The discharge of pollutants to surface waters that would not be visually detectable in storm water during discharges resulting from a breach, malfunction, leakage, or spill observed during a visual inspection; and
- o A sample of stormwater that hasn't come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample).

A. Effluent Monitoring Requirements

1. Non-Visible Pollutant Sampling and Analysis

Potential Pollutant Sources

Some pollutants may be discharged to surface waters that would not be visually detectable in storm water. Sampling for these pollutants is required when:

- There are potential pollutant sources (e.g., historical pollutants, construction materials) on-site that will come into contact with storm water; and/or
- There is any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

Storm water monitoring will be conducted to determine whether pollutants that are known or should be known to occur on the construction site and that cannot be visually observed or detected in storm water discharges, are being conveyed from the site by storm water. If pollutants are conveyed from the site in storm water discharges, they may cause or contribute to exceedances of water quality objectives in the receiving water.

Storm water monitoring will be performed in conjunction with storm event visual inspections that are required under the CGP. The following inspection forms shall be completed:

- For non-storm water: Visual Observation (Inspection) form for Non-Storm Water Discharges (Blank Form in Appendix I/Completed Form in Appendix XI.F).
- Sampling Event Worksheet (Blank Form in Appendix I/Completed Form in Appendix XI.B)

Historical Pollutants

Prior to commencement of construction at this project, the site was used for a Liquefied Natural Gas (LNG) Plant. Based on a review of the Proponent's

Environmental Assessment, the Environmental Impact Report, and the Phase I and II Environmental Site Assessments (ESA), existing pollutants that would not be visually detectable in storm water may be present.

In 2007, a Phase I ESA (File No. 34318-000) was conducted for the former LNG site. The Recognized Environmental Conditions (RECs) and historical RECs associated with the approximately 33-acre site included oil staining of surface soil at various locations around the site, a historic oil spill, historic mercaptan spill and use of herbicides/pesticides in the northwestern portion of the site, and the potential for fuel residue around the concrete pad associated with firefighting training performed by the Chula Vista Fire Department.

As a result of the findings of the Phase I ESA, a follow-up Phase II ESA was conducted at the LNG site to further investigate potential contamination below the ground surface. Depending on the depth and location of the samples, soil was tested for total petroleum hydrocarbons (TPHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), metals, pesticides, and herbicides. In addition, some borings included collection of groundwater samples that were analyzed for total TPH and VOC. The results of the Phase II investigation concluded the following:

- One soil sample detected TPH-diesel range at a concentration of 330 milligram/kilogram (mg/kg). This TPH concentration is below the historical cleanup level of 1000 mg/kg.
- VOC and PCB detections were below the laboratory reporting limits (i.e., non-detectable) at all boring locations.
- Barium, chromium, copper, cobalt, vanadium, and zinc were detected in the soil samples; however, detection concentrations were below the published range of naturally occurring background levels in Southern California, according to the California Environmental Protection Agency.
- TPHs and VOCs were not detected in groundwater samples.

Accordingly, the results from the Phase I and II ESAs indicated that the proposed Bay Boulevard Substation site does not possess contamination with constituents sampled during the Phase II investigation. Moreover, of the three soil and groundwater samples obtained from the Bay Boulevard Substation site, TPHs, PCBs, and VOCs were all non-detectable.

Therefore, no hazardous materials are anticipated to be encountered during construction of the South Bay Substation Relocation Project.

Analytes that will be measured to determine the presence of the above pollutants are: None

Construction Materials

A list of the project potential pollutants is located in Appendix V. The list of potential pollutants generated includes all pollutants that would be non-visible in stormwater runoff that are known or should be known to occur on the construction site. These "non-visible" pollutants are listed below. Non-visible pollutants require monitoring when they are intentionally exposed (e.g., application of soil amendments) or in the event there is a breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of these pollutants to surface waters that would not be visually detectable in storm water. Table 1 identified pollutants most likely to be exposed to storm water on the construction site (a complete list of the project potential pollutants is located in Appendix V.

Table 1 -Potential Non-Visible Pollutants and Water Quality Indicator Constituents

Pollutant Source	Pollutant	Water Quality Indicator Constituents(s)
Adhesives	Phenolics, formaldehydes, benzene, phenols, and naphthalene	Semi Volatile Organic Compounds (SVOCs)
Cement materials associated with PCC concrete paving operations	pH adjustment	pH
Solvents	Refer to product inventory maintained by QSP in Appendix V	Volatile Organic Compounds (VOCs)
Vehicle and equipment use	Total petroleum hydrocarbons, coolants, benzene, and derivatives	VOCs – when spill is suspected and sheen is not visible

Based on the pollutants identified, the indicator parameters identified in Table 1 will be analyzed, as applicable, to assess if pollutants are potentially being conveyed from the site by storm water.

Sampling and Analysis

- General - Grab samples shall be collected as follows:
  - Water samples shall be large enough to characterize the site conditions.
  - Samples shall be collected at all discharge locations that can be safely accessed.

- Locations
  - **Discharge points** – Samples shall be collected in areas associated with the pollutants identified above. Samples shall be collected down-gradient of the area(s) affected by a planned exposure (e.g., application of a soil amendment) or by any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water. The sample locations for areas affected by planned exposures are identified and described in Appendix XI.H. Sample locations where samples for unplanned discharges are taken will be added to Appendix XI.H.
  - **Uncontaminated Sample** – A sample of storm water shall be collected that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample. This sample location(s) is identified and described in Appendix XI.H.
- Frequency
  - Samples shall be collected during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- Parameters
  - Samples shall be analyzed for indicator parameters identified in Table 1 that correspond to the specific construction activity or material associated with the spill, breach, or malfunction.
  - Dischargers shall modify their CSMP to address any additional parameters in accordance with any updated SWPPP pollutant source assessment.
- Sampling and Analysis
  - Section 4 and 5 (CSMP) contains the details of the sampling and analysis requirements for the applicable parameters.
- Reporting
  - All storm event sampling results shall be retained in the SWPPP and submitted to the SWRCB in the annual report.

- Records
  - Retain all field and/or analytical data in the SWPPP document. Generally all sampling and analysis related records are required to be retained for a minimum of three years. See CSMP Section 12 for record retention requirements.

B. Sampling Collection Exemptions

Samples are not required to be collected under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours.

If no required samples are collected due to these exceptions, an explanation shall be included in their SWPPP and in the Annual Report documenting why the sampling was not conducted.

4. EFFLUENT SAMPLE COLLECTION AND HANDLING INSTRUCTIONS

This section describes the instructions for sample collection and handling and includes:

- Detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained.
- An example Chain of Custody form to be used when handling and shipping samples.
- Identification of the analytical methods and related method detection limits (if applicable) for each parameter.

A. General Requirements

- Ensure that water samples are large enough to characterize the site conditions.

- Sampling and sample preservation shall be conducted in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association).

- All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements.

- All laboratory analyses shall be conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services.

- The discharger can conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

Specific procedures are described below for parameters that are analyzed in the field and for parameters that are analyzed in a certified laboratory.

1. For Parameters Analyzed in the Field

   pH:

   - Sampling and Analyses:
     - Effluent sample locations are identified in Appendix XI.H.
     - Field meters will be calibrated, maintained, and operated by trained staff according to the manufacturer's specifications, and calibration records will be stored in Appendix XI.B.
     - Sampling and analysis for this parameter shall be conducted on-site by trained personnel with a portable field instrument in accordance with the instrument's instructions.
     - Sampling shall be conducted also in accordance with the field QA/QC document in Appendix XI.I.
     - Section 5 and Table 2 provides the Test Method, Protocol, Minimum Detection Limit and Reporting Units.

2. For Parameters Analyzed in a Laboratory

   General: The laboratory will provide properly cleaned and preserved (if applicable) sampling containers (bottles) for the samples, and labels on the sample bottles. The sample bottle labels will identify the analysis to be performed and any preservative contained in the bottles, and provide room for recording the sample location and time and date of collection. The laboratory will also provide chain-of-custody forms. An example Chain of Custody form is located in Appendix I.

   Personnel shall be designated and trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP). These personnel are identified in Appendix XIII.

<u>Other Parameters (when applicable)</u>:

- Sampling:
  - Effluent sample locations are identified in Appendix XI.H.
  - Sampling shall be conducted by trained personnel in accordance with the field QA/QC document in Appendix XI.I.
  - Samples shall be collected only in containers provided by the laboratory to which they will be sent.
  - Samples will be preserved in accordance with Table 3.
  - Samples shall shipped using a using a method so that the laboratory receives them the same day or no later than 48 hours from their physical sampling (unless otherwise required by the laboratory).
- Analysis:
  - Section 5 and Table 3 provides the test method, minimum sample volume, sampling container, preservative and holding time for the expected parameters.
  - If these analyses are required, samples will be sent to the laboratory identified in Appendix XI.G.

Table 2 - Testing methods, detection limits and reporting units for pH Turbidity.

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units
pH	Field test with calibrated portable instrument	Indicator of non-visible pollutants	0.2	pH

Table 3 – Applicable Sample Collection Information for Parameters to be Analyzed at a Certified Laboratory

Analyte	EPA Analytical Method Number	Minimum Sample Volume[3]	Sampling Container	Preservative[4]	Holding Time
pH	EPA 150.1 (pH)	250 mL	Plastic bottle	None	Onsite; ASAP
VOC	EPA 601/602 or EPA 624 (VOC)	2 each – 40 mL	VOA Vial w/HCL	None	14 days
SVOC	EPA 625 (SVOC)	2 each – 1 liter	Amber glass	None	7 days

[3]Minimum sample volume recommended. Specific volume requirements will vary by laboratory and must be verified with the laboratory when bottles are ordered.

[4]Do not pre-rinse or overfill sample containers that contain preservative.

[5]All samples must be kept chilled to 4°C (keep samples on ice for delivery to analytical laboratory)

5. ANALYTICAL AND MONITORING METHODS

A. Effluent Sampling Methods:

Refer to Table 2 in Section 4 above for test methods, detection limits, and reporting units.

- **pH**: Perform pH analysis on-site with a calibrated pH meter or pH test kit. Record pH results in Appendix XI.B and retain these records in accordance with the CSMP Records Section 12.

- **Non-Visible Pollutants:** Refer to Table 3 in Section 4 above for analytical methods for non-visible pollutants.

Evaluation of Results

The South Bay Substation Relocation Project is located in the San Diego Bay Hydrologic Unit, Undefined Hydrologic Sub-Area, Hydrologic Sub-Area Number 912.00; Otay Hydrologic Unit, Otay Valley Hydrologic Area, Undefined Hydrologic Sub-Area, Hydrologic Sub-Area Number 910.2; and Sweetwater Hydrologic Unit, Lower Sweetwater Hydrologic Area, Telegraph Hydrologic Sub-Area, Hydrologic Sub-Area Number 909.11. The Water Quality Control Plan for the San Diego Region ("Basin Plan") provides water quality objectives for some of the analytes that will be monitored. While these do not constitute a discharge standard or limit, these water quality objectives will be used as decision making benchmark standards. Where such standards are not available through the Basin Plan, benchmark standards set forth by other agencies will be used for decision making purposes.

Table 4 – Benchmarks for Review of Non-Visible Pollutants

Benchmark Criteria for Decision Making		
Analyte	Benchmark Concentration	Reference
pH	Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR), or estuarine (EST), or saline (SAL) beneficial uses. Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated cold freshwater habitat (COLD) or warm freshwater habitat (WARM) beneficial uses.*[1] In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0. In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.	Basin Plan

[1] The existing designated beneficial uses for Telegraph Canyon Creek are Industrial Service Supply (IND), Noncontact Water Recreation (REC2), Warm Freshwater Habitat (WARM), and Wildlife Habitat (WILD). Water Contact Recreation (REC1) is also a potential beneficial use for Telegraph Canyon Creek. The existing designated beneficial uses for San Diego Bay are IND, Navigation (NAV), REC1, REC2, Commercial and Sport Fishing (COMM), Preservation of Biological Habitats of Special Significance (BIOL), Estuarine Habitat (EST), WILD, Preservation of Rare and Endangered Species (RARE), Marine Habitat (MAR), Fish Migration (MIGR), Fish Spawning (SPWN), WARM, and Shellfish Water Recreation (SHELL).

Benchmark Criteria for Decision Making		
Analyte	Benchmark Concentration	Reference
VOCs**[2]	<u>Organic Chemical Constituents-Maximum Contaminant Level (mg/l)</u> Benzene 0.001 Carbon Tetrachloride 0.005 1,2-Dichlorobenzene 0.6 Benzene 0.001 Carbon Tetrachloride 0.0005 1,2-Dichlorobenzene 0.6 1,4-Dichlorobenzene 0.005 1,1-Dichloroethane 0.005 1,2-Dichloroethane 0.0005 1,1-Dichloroethylne 0.006 cis-1,2-Dichloroethylene 0.006 trans-1,2-Dichloroethylene 0.01 Dichloromethane 0.005 1,2-Dichloropropane 0.005 1,3-Dichloropropene 0.0005 Ethylbenzene 0.3 Methyl-tert-butyl ether 0.013 Monochlorobenzene 0.07 Styrene 0.1 1,1,2,2-Tetrachloroethane 0.001 Tetrachloroethylene 0.005 Toluene 0.15 1,2,4-Trichlorobenzene 0.005 1,1,1-Trichloroethane 0.200 1,1,2-Trichloroethane 0.005 Trichloroethylene 0.005 Trichlorofluoromethane 0.15 1,1,2-Trichloro-1,2,2-Trifluoroethane 1.2 Vinyl Chloride 0.0005 Xylenes 1.750	Basin Plan

[2] The VOC and SVOC benchmark concentrations are only applicable to waters designated for beneficial use as Municipal and Domestic Supply (MUN), but are included for reference.

Benchmark Criteria for Decision Making		
Analyte	Benchmark Concentration	Reference
Non-Voltatile Synthetic Organic Chemicals (SOCs)	Organic Chemical Constituents-Maximum Contaminant Level (mg/l) Alachlor 0.002 Atrazine 0.001 Bentazon 0.018 Benzo(a)pyrene 0.0002 Carbofuran 0.018 Chlordane 0.0001 2,4-D 0.07 Dalapon 0.2 Dibromochloropropane 0.0002 Di(2-ethylhexyl)adipate 0.4 Di(2-ethylhexyl)phthalate 0.004 Dinoseb 0.007 Diquat 0.02 Endothall 0.1 Endrin 0.002 Ethylene Dibromide 0.00005 Glyphosate 0.7 Heptachlor 0.00001 Heptachlor Epoxide 0.00001 Hexachlorobenezene 0.001 Hexachlorocyclopentadiene 0.05 Lindane 0.0002 Methoxychlor 0.03 Molinate 0.02 Oxamyl 0.05 Pentachlorophenol 0.001 Picloram 0.5 Polychlorinated Biphenyls 0.0005 Simazine 0.004 Thiobencarb 0.07 Toxaphene 0.003 2,3,7,8-TCDD (Dioxin) 3 x 10 - 8 2,3,5-TP (Silvex) 0.05	Basin Plan

6. NAL EXCEEDANCE REPORTS

This is a Risk Level 1 project, therefore this section does not apply.

7. NEL VIOLATION REPORT

This is a Risk Level 1 project, therefore this section does not apply.

8. COMPLIANCE STORM EVENT EXEMPTION

This is a Risk Level 1 project, therefore this section does not apply.

9. WATERSHED MONITORING OPTION

This is a Risk Level 1 project, therefore this section does not apply.

10. PARTICLE SIZE ANALYSIS FOR PROJECT RISK JUSTIFICATION

This Project is justifying an alternative project risk. Refer to Appendix IV for calculations.

This Project is not utilizing a sediment basin and/or justifying an alternative project risk.

11. BIOASSESSMENT

This is a Risk Level 1 project, therefore this section does not apply.

12. RECORDS

The following records of all storm water monitoring information and copies of all reports (including Annual Reports) shall be retained for a period of at least three years. All records shall be retained on-site while construction is ongoing. These records include:

- The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- The date and approximate time of analyses.
- The individual(s) who performed the analyses.
- A summary of all analytical results from the last three years, the method detection limits and reporting units and the analytical techniques or methods used,.
- Rain gauge readings from site inspections.
- Quality assurance/quality control records and results.
- Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).
- Visual observation and sample collection exception records (see Section I.6 above).
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

CSMP – Inspection and Sampling Locations

Ref#	Name	Location		Sample Parameters	Sample Containers Required	
		Description	GPS Coordinates		Yes	No

Sample Location Reference Abbreviations:
Observations: **VQRE** (Visual Observations for a QRE); **VNSW** (Visual Observations for Non-Stormwater);
Sampling: **SNVP** (Sampling for Non-Visually Detectible Pollutants; **SUC** (Sampling of Uncontaminated Sample Location)

APPENDIX XI:

CSMP ATTACHMENTS

Copies of all reports will be included upon completion.

Sampling and analysis results will be included upon completion.

Sample forms will be included upon completion.

Regional Water Quality Control Board correspondence about additional parameters for storm water sampling will be included upon receipt.

Contaminated soil documentation/notification will be included upon receipt.

Observation (inspection) forms will be included upon completion.

Analytical laboratory(ies) will be included upon receipt.

Inspection/Sample Location Table will be included upon completion.

Quality Assurance and Quality Control

An effective Quality Assurance and Quality Control (QA/QC) plan will be implemented as part of the Construction Site Monitoring Program to ensure that analytical data can be used with confidence. QA/QC procedures to be initiated include the following:

- Field logs;
- Clean sampling techniques;
- Chains of Custody (CoCs);
- QA/QC Samples; and
- Data verification.

Each of these procedures is discussed in more detail in the following sections.

1. Field Logs

The purpose of field logs is to record sampling information and field observations during monitoring that may explain any uncharacteristic analytical results. Sampling information to be included in the field log includes the date and time of water quality sample collection, sampling personnel, sample container identification numbers, and types of samples that were collected. Field observations should be noted in the field log for any abnormalities at the sampling location (e.g., color, odor, best management practices, etc.).

2. Clean Sampling Techniques

Clean sampling techniques involve the use of certified clean containers for sample collection and clean, powder-free nitrile gloves during sample collection and handling. Adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

3. Chain of Custody

The sample CoC is an important documentation step that tracks samples from collection through analysis to ensure the validity of the sample. Sample CoC procedures include the following:

- Proper labeling of samples;
- Use of CoC forms for all samples; and
- Prompt sample delivery to the analytical laboratory.

Analytical laboratories usually provide CoC forms to be filled out for sample containers. An example CoC is included in Appendix I.

4. QA/QC Samples

QA/QC samples provide an indication of the accuracy and precision of the sample collection, sample handling, field measurements, and analytical laboratory methods. The following types of QA/QC will be conducted for the South Bay Substation Relocation Project.

QA/QC Sample Frequency

QA/QC Sample Type	Sampling Frequency
Equipment Blanks	Will be collected from polypropylene grab sampling equipment prior to the sampling season.
Field Duplicates	Will be collected for 10 percent of the total number of samples collected.
Laboratory Duplicates	Will be collected for 10 percent of the total number of samples collected.
Matrix Spike/Matrix Spike Duplicates	Will be collected for 10 percent of the total number of samples collected.
Method Blanks	Will be run with each QC batch analyzed by the laboratory.

4.1 Field Duplicates

Field duplicates will be collected and analyzed for 10 percent or the total number of grab samples collected. Field duplicates provide verification of laboratory or field analysis and sample collection. Duplicate samples will be collected, handled, and analyzed using the same protocols as primary samples. The sample location where field duplicates are collected will be randomly selected from the discharge locations. Duplicate samples will be collected immediately after the primary sample has been collected. Duplicate samples must be collected in the same manner and as soon as possible to the original sample. Duplicate samples will not influence any evaluations or conclusion.

4.2 Equipment Blanks

Equipment blanks provide verification that equipment has not introduced a pollutant into the sample. Equipment blanks are typically collected when the following occurs:

- New equipment is used;
- Equipment has been cleaned after use at a contaminated site;
- Equipment that is not dedicated for surface water sampling is used; or

- A new lot of filters is used when sampling metals.

4.3 Field Blanks

Field blanks assess potential sample contamination levels that occur during field sampling activities. Deionized water field blanks are taken to the field, transferred to the appropriate container, and treated the same as the corresponding sample type during the course of a sampling event.

4.4 Travel Blanks

Travel blanks assess the potential for cross-contamination of volatile constituents between sample containers during shipment from the field to the laboratory. Deionized water blanks are taken along for the trip and are held unopened in the same cooler with the volatile organic compound samples.

5 Data Verification

After results are received from the analytical laboratory, the Qualified Storm Water Pollution Prevention Plan Practitioner (QSP) will verify the data to ensure that it is complete, accurate, and the appropriate QA/QC requirements were met. Data must be verified as soon as the data reports are received. Data verification will include the following:

- **Check the CoC and laboratory reports.** Ensure all requested analyses were performed and all samples are accounted for in the reports.

- **Check laboratory reports to verify that hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract.**

- **Check data for outlier values and follow up with the laboratory.** Occasionally typographical errors, unit reporting errors, or incomplete results are reported and should be easily detected. These errors need to be identified, clarified, and corrected quickly by the laboratory. The QSP should especially note data that is an order of magnitude, is different than similar locations, or is inconsistent with previous data from the same location.

- **Check laboratory QA/QC results.** The Environmental Protection Agency establishes QA/QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. The QSP will evaluate the reported QA/QC data to check for contamination (e.g., method, field, and equipment blanks), precision (e.g., laboratory matrix spike duplicates), and accuracy (e.g., matrix spikes and laboratory control samples). When QA/QC checks are outside of acceptable ranges, the laboratory must flag the data, and usually provides an explanation of the potential impact to the sample results.

- **Check the data set for outlier values, confirm the results accordingly, and re-analyze samples where appropriate.** Sample re-analysis should only be undertaken when it appears that some part of the QA/QC resulted in a value out of the accepted range. Sample results may not be discounted unless the analytical laboratory identifies the required QA/QC criteria were not met and confirms this in writing.

Field data, including inspections and observations, must be verified as soon as the field logs are received, which is typically at the end of the sampling event. Field data verification will include the following:

- Check field logs to verify that all required measurements were completed and appropriately documented;
- Check reported values that appear to be inconsistent or out of the typical range;
- Follow up immediately to identify potential reporting or equipment problems and , if appropriate, recalibrate equipment after sampling;
- Verify equipment calibrations;
- Review observations noted on the field logs; and
- Review notations of any errors and actions taken to correct the equipment or recording errors.

APPENDIX XII:

PERMIT REGISTRATION DOCUMENTS (PRDS)

Permit Registration Documents will be included prior to uploading the Storm Water Pollution Prevention Plan to the Storm Water Multiple Application and Reporting Tracking System.

Subsequent Permit Registration Documents submittal will be included upon completion.

The Notice of Termination will be included upon completion.

Change of Information Documents will be included upon completion.

APPENDIX XIII:

RESPONSIBLE PARTIES

LIST OF RESPONSIBLE PARTIES
(Store in Appendix XIII)

PROJECT: ______ **WDID** ______

☐ ***LEGALLY RESPONSIBLE PART (LRP)*** ☐ ***THE LRP's APPROVED SIGNATORY***

AREA OF RESPONSIBILITY:	**[SDG&E: PROVIDE]**
NAME	Richard Pearson
TITLE:	Director, Environmental Services
COMPANY NAME:	San Diego Gas & Electric Company (SDG&E)
ADDRESS	8315 Century Park Court
CITY	San Diego
STATE	CA
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EMERGENCY TELEPHONE	**[SDG&E: PROVIDE]**
FAX	**[SDG&E: PROVIDE]**
E-MAIL	spearson@semprautilities.com

QUALIFIED SWPPP DEVELOPER (QSD):PRIMARY SWPPP DEVELOPER:

NAME	Erika Carrillo
TITLE:	Lead Planner
COMPANY NAME:	Insignia Environmental (Insignia)
ADDRESS	258 High Street
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EMERGENCY TELEPHONE	(650) 722-2735
FAX	(650) 321-3787
E-MAIL	ecarrillo@insigniaenv.com

ADDITIONAL QSDs:

NAME	Armen Keochekian
TITLE:	Director
COMPANY NAME:	Insignia
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STATE	CA
ZIP	92024
TELEPHONE	(760) 635-1587 x302
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FAX	(650) 321-3787

E-MAIL akeochekian@insignaenv.com

DATES WORKED ON PROJECT	August 1, 2014 **[B&V: CONFIRM]**		July 31, 2017 **[B&V: CONFIRM]**

QUALIFIED SWPPP PRACTITIONER (QSP):

AREA OF RESPONSIBILITY:	Erosion and Sediment Control Inspection

NAME Armen Keochekian **TITLE:** Director
COMPANY NAME: Insignia
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CITY Encinitas **STATE** CA **ZIP** 92024
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EMERGENCY TELEPHONE (760) 707-8206
FAX (650) 321-3787
E-MAIL akeochekian@insigniaenv.com
START DATE August 1 2014 **[B&V: CONFIRM]** **END DATE** July 31, 2017 **[B&V: CONFIRM]**

ADDITIONAL QSP:

AREA OF RESPONSIBILITY:	

NAME **TITLE:**
COMPANY NAME:
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX
E-MAIL
START DATE **END DATE**

SPILL RESPONSE PERSONNEL

NAME Eric Cosgrove **TITLE:** Project Manager, Energy – Power Delivery
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CITY Lake Oswego **STATE** OR **ZIP** 97035
TELEPHONE (503) 443-4435
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FAX	(503) 443-4499
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START DATE	August 1, 2014 **[B&V: CONFIRM]** **END DATE** July 31, 2017 **[B&V: CONFIRM]**

SPILL RESPONSE PERSONNEL					
NAME	Jim Gibson	**TITLE:**	Lead Planner		
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CITY	Encinitas	**STATE**	CA	**ZIP**	92024
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E-MAIL	jgibson@insigniaenv.com				
START DATE	August 1, 2014 **[B&V: CONFIRM]**	**END DATE**	July 31, 2017 **[B&V: CONFIRM]**		

SPILL RESPONSE PERSONNEL					
NAME	Jennifer Kaminsky	**TITLE:**	Environmental Compliance Specialist		
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E-MAIL	jkaminsky@burnsmcd.com				
START DATE	August 1, 2014 **[B&V: CONFIRM]**	**END DATE**	July 31, 2014 **[B&V: CONFIRM]**		

SPILL RESPONSE PERSONNEL					
NAME		**TITLE:**			
ADDRESS					
CITY		**STATE**		**ZIP**	
TELEPHONE					
EMERGENCY TELEPHONE					
FAX					
E-MAIL					

START DATE		END DATE	

STORM WATER SAMPLING AGENT:					
CONTACT PERSON	Jim Gibson	**TITLE:**	Lead Planner		
ADDRESS	904 2nd Street				
CITY	Encinitas	**STATE**	CA	**ZIP**	92024
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EMERGENCY TELEPHONE	(415) 254-1021				
FAX	(650) 321-3787				
E-MAIL	jgibson@insigniaenv.com				
START DATE	August 1, 2014 **[B&V: CONFIRM]**	**END DATE**	July 31, 2014 **[B&V: CONFIRM]**		

STORM WATER SAMPLING AGENT:					
CONTACT PERSON		**TITLE:**			
ADDRESS					
CITY		**STATE**		**ZIP**	
TELEPHONE					
EMERGENCY TELEPHONE					
FAX					
E-MAIL					
START DATE		**END DATE**			

STORM WATER SAMPLING AGENT:					
CONTACT PERSON		**TITLE:**			
ADDRESS					
CITY		**STATE**		**ZIP**	
TELEPHONE					
EMERGENCY TELEPHONE					
FAX					
E-MAIL					
START DATE		**END DATE**			

STORM WATER SAMPLING AGENT:			
CONTACT PERSON		**TITLE:**	
ADDRESS			
CITY		**STATE**	
ZIP			
TELEPHONE			
EMERGENCY TELEPHONE			
FAX			
E-MAIL			
START DATE		**END DATE**	

REGIONAL BOARD CONTACT INFORMATION		***RQWQB NAME:***	San Diego Regional Water Quality Control Board
CONTACT PERSON	Whitney Ghoram	**TITLE:**	Sanitary Engineering Associate
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EMERGENCY TELEPHONE			
FAX	(619) 516-1994		
E-MAIL	Whitney.ghoram@waterboards.ca.gov		

LOCAL STORM WATER MANAGEMENT AGENCY		***AGENCY NAME:***	City of Chula Vista
CONTACT PERSON	**[SDG&E: PROVIDE]**	**TITLE:**	**[SDG&E: PROVIDE]**
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CITY	Chula Vista	**STATE**	CA
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EMERGENCY TELEPHONE			
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E-MAIL	**[SDG&E: PROVIDE]**		

✔ CONTRACTOR ☐ SUBCONTRACTOR ☐ INDIVIDUAL DIRECTED BY QSP ☐ OTHER

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

COMPANY NAME	**[B&V: PROVIDE]**				
CONTACT PERSON	**[B&V: PROVIDE]**	**TITLE:**	**[B&V: PROVIDE]**		
ADDRESS	**[B&V: PROVIDE]**				
CITY	**[B&V: PROVIDE]**	**STATE**	**[B&V: PROVIDE]**	**ZIP**	**[B&V: PROVIDE]**
TELEPHONE	**[B&V: PROVIDE]**				
EMERGENCY TELEPHONE	**[B&V: PROVIDE]**				
FAX	**[B&V: PROVIDE]**				
E-MAIL	**[B&V: PROVIDE]**				
START DATE	**[B&V: PROVIDE]**	**END DATE**	**[B&V: PROVIDE]**		

☐ CONTRACTOR ✔ SUBCONTRACTOR ☐ INDIVIDUAL DIRECTED BY QSP ☐ OTHER

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME	**[B&V: PROVIDE]**	**TITLE:**	**[B&V: PROVIDE]**		
ADDRESS	**[B&V: PROVIDE]**				
CITY	**[B&V: PROVIDE]**	**STATE**	**[B&V: PROVIDE]**	**ZIP**	**[B&V: PROVIDE]**
TELEPHONE	**[B&V: PROVIDE]**				
EMERGENCY TELEPHONE	**[B&V: PROVIDE]**				
FAX	**[B&V: PROVIDE]**				
E-MAIL	**[B&V: PROVIDE]**				
START DATE	**[B&V: PROVIDE]**	**END DATE**	**[B&V: PROVIDE]**		

☐ CONTRACTOR ☐ SUBCONTRACTOR ✔ INDIVIDUAL DIRECTED BY QSP ☐ OTHER

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

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EMERGENCY TELEPHONE	(415) 254-1021				
FAX	(650) 321-3787				

E-MAIL jgibson@insigniaenv.com
START DATE August 1, 2014 **[B&V: CONFIRM]** **END DATE** July 31, 2017 **[B&V: CONFIRM]**

☐ CONTRACTOR ☐ SUBCONTRACTOR ☐ INDIVIDUAL DIRECTED BY QSP ✔ OTHER

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

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FAX **[SDG&E: PROVIDE]**
E-MAIL EMoreno5@semprautilities.com
START DATE August 1, 2014 **[B&V: CONFIRM]** **END DATE** July 31, 2017 **[B&V: CONFIRM]**

☐ CONTRACTOR ☐ SUBCONTRACTOR ☐ INDIVIDUAL DIRECTED BY QSP ☐ OTHER

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME **TITLE:**
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX
E-MAIL
START DATE **END DATE**

☐ CONTRACTOR ☐ SUBCONTRACTOR ☐ INDIVIDUAL DIRECTED BY QSP ☐ OTHER

PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:

NAME **TITLE:**
ADDRESS
CITY **STATE** **ZIP**
TELEPHONE
EMERGENCY TELEPHONE
FAX

E-MAIL ____________________

START DATE ____________ **END DATE** ____________

☐ *CONTRACTOR*	☐ *SUBCONTRACTOR*	☐ *INDIVIDUAL DIRECTED BY QSP*	☐ *OTHER*
PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:			

NAME ____________ **TITLE:** ____________

ADDRESS ____________________

CITY ____________ **STATE** ____________ **ZIP** ____________

TELEPHONE ____________________

EMERGENCY TELEPHONE ____________________

FAX ____________________

E-MAIL ____________________

START DATE ____________ **END DATE** ____________

☐ *CONTRACTOR*	☐ *SUBCONTRACTOR*	☐ *INDIVIDUAL DIRECTED BY QSP*	☐ *OTHER*
PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:			

NAME ____________ **TITLE:** ____________

ADDRESS ____________________

CITY ____________ **STATE** ____________ **ZIP** ____________

TELEPHONE ____________________

EMERGENCY TELEPHONE ____________________

FAX ____________________

E-MAIL ____________________

START DATE ____________ **END DATE** ____________

☐ *CONTRACTOR*	☐ *SUBCONTRACTOR*	☐ *INDIVIDUAL DIRECTED BY QSP*	☐ *OTHER*
PLEASE CHECK APPROPRIATE BOX ABOVE. IF "OTHER", PLEASE INDICATE:			

NAME ____________ **TITLE:** ____________

ADDRESS ____________________

CITY ____________ **STATE** ____________ **ZIP** ____________

TELEPHONE ____________________

EMERGENCY TELEPHONE ____________________

FAX ______________________________

E-MAIL ______________________________

START DATE ______________ **END DATE** ______________

APPENDIX XIV:

INSPECTION CHECKLISTS

Spill/Leak History Record will be included upon completion.

APPENDIX XV:

TRAINING DOCUMENTATION

Contractor training log will be included upon completion.

CERTIFICATE OF TRAINING

CALIFORNIA CONSTRUCTION GENERAL PERMIT

QUALIFIED SWPPP DEVELOPER (QSD)
AND
QUALIFIED SWPPP PRACTITIONER (QSP)

Erika Carrillo

Oct 02, 2012 - Oct 02, 2014

Certificate # 23555

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

California Stormwater Quality Association and
California Construction General Permit Training Team

CERTIFICATE OF TRAINING

CALIFORNIA CONSTRUCTION GENERAL PERMIT

QUALIFIED SWPPP DEVELOPER (QSD)
AND
QUALIFIED SWPPP PRACTITIONER (QSP)

Armen Keochekian

Feb 14, 2013 - May 09, 2015

Certificate # 00075

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

California Stormwater Quality Association and
California Construction General Permit Training Team

Storm Water Pollution Prevention Plan training and qualifications log will be included upon completion.

APPENDIX XVI:

AMENDMENT LOG

The Storm Water Pollution Prevention Plan Amendment Log will be included upon completion.

The Storm Water Pollution Prevention Plan Amendment Log will be included upon completion.

APPENDIX XVII:

REPORTS

The Annual Report will be included upon completion.

The Notification of Anticipated Non-Compliance will be included upon completion.

The Storm Water Reports will be included upon completion.

APPENDIX XVIII:

SECONDARY CONTAINMENT AND SPILL KIT INVENTORY

The Secondary Containment and Spill Kit Inventory will be included upon completion.

APPENDIX XIX:

OTHER SWPPP EXHIBITS

DRAINAGE STUDY FOR BAY BOULEVARD SUBSTATION

DRAINAGE STUDY

FOR

BAY BOULEVARD SUBSTATION

December 2013

Prepared for: San Diego Gas & Electric Company
8316 Century Park Court
San Diego, CA 92123

Prepared by: Nolte Associates, Inc. (NV5)
15070 Avenue of Science, Suite 100
San Diego, CA 92128

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APPENDICES

1.0 INTRODUCTION

Nolte Associates, Inc. (NV5) has been retained by Black and Veatch to perform hydrologic and hydraulic analyses for the proposed San Diego Gas and Electric (SDG&E) Bay Boulevard Substation. The proposed substation site is located at 1050 Bay Boulevard, within the City of Chula Vista, California and principally serves as a relocation of the existing South Bay Substation located approximately 0.5 miles to the north (see Figure 1). Significant on-site features include imported fill for various equipment and foundation types, asphalt concrete access roads and associated culvert crossings, a large water quality basin along the western side of the site, and a concrete masonry screen wall around the pad perimeter. Hydrologic calculations presented within this report address pre- and post-project on-site conditions, in addition to pertinent existing off-site areas. Hydraulic calculations support the proposed water quality basin and other various on-site and off-site flow conveyance facilities.

1.1 Purpose and Scope

The purpose of this study is to provide both the on-site and off-site hydrologic and hydraulic calculations in support of the proposed Bay Boulevard Substation. On-site hydrologic calculations, as they pertain to this report, refer to the approximately 23.5 acre drainage area that is affected by the proposed project. Pre-project and post-project 100-year, 6-hour peak discharge rates are calculated at two points of interest for comparison, referred to hereafter as the “Northwest Corner” and “Southwest Corner.” Discharge from the Northwest Corner ultimately continues northerly via a concrete drainage swale before discharging into the San Diego Bay. Discharge from the Southwest Corner travels a short distance before entering the salt evaporation ponds. Off-site hydrologic calculations encompass approximately 122.8 acres located east of the on-site area and determined the 100-year, 24-hour peak discharge rates assuming existing conditions. These discharge values were necessary for the evaluation of the proposed culvert along the drainage ditch at the southeastern asphalt concrete entrance to the substation.

Hydraulic calculations were conducted for the water quality basin along the western side of the site for the 100-year, 6-hour inflow hydrograph. Specifically, storage routing calculations were performed to determine the attenuation and drainage characteristics of the water quality basin.

Hydraulic calculations were also performed for the four on-site access road culvert crossings (A, B, C, and D) along the eastern side of the substation pad. These culverts were sized using the 100-year peak discharge values to ensure that the computed headwater elevations do not create ponding conditions.

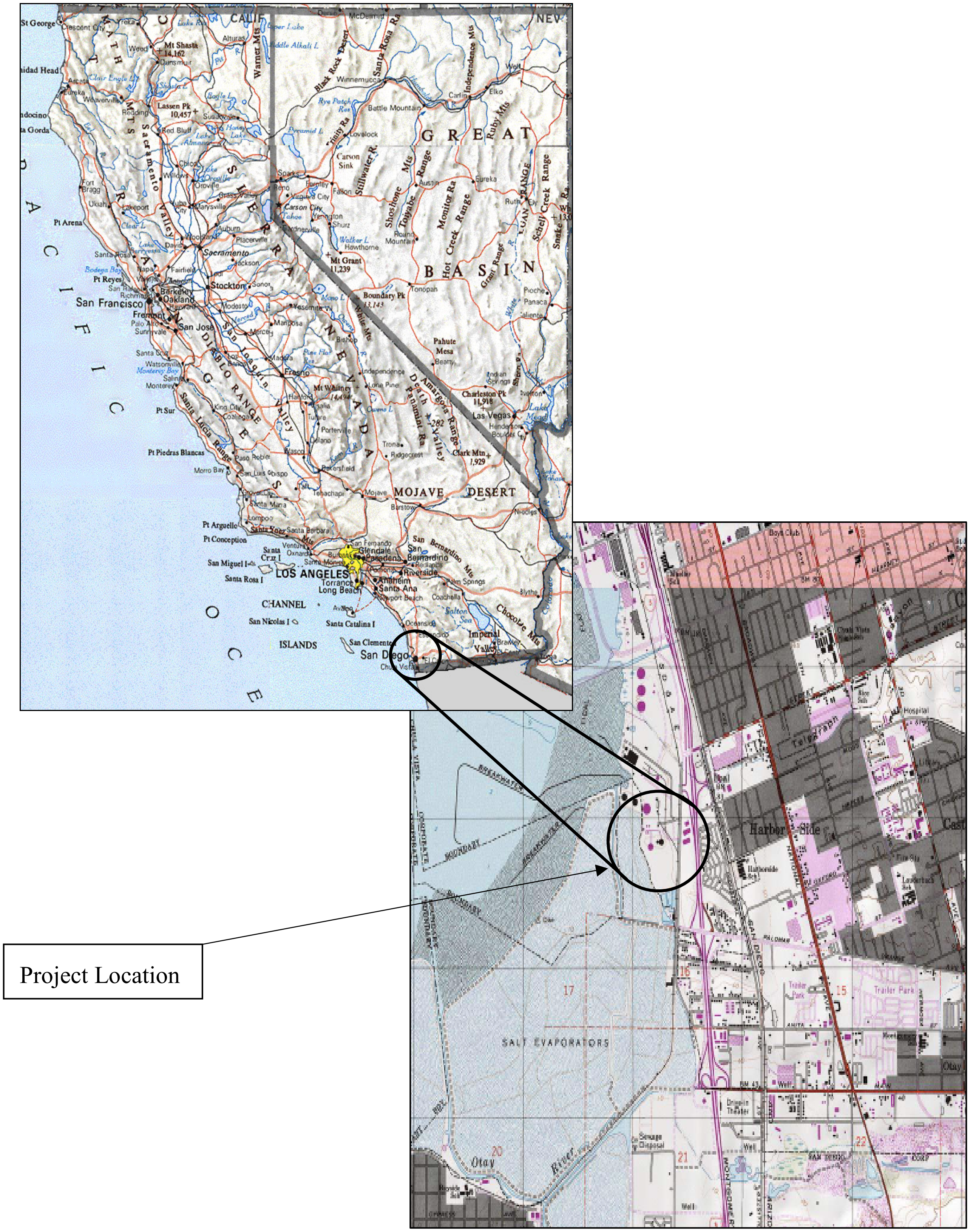
Due to the aforementioned concrete masonry perimeter wall, four wall cutouts are proposed to allow stormwater to drain from the proposed substation pad area. Three of these cutouts allow drainage to discharge directly into the water quality basin. The remaining cutout allows stormwater at the southeastern corner of the substation pad to discharge into a graded drainage swale which flows to a wetland area. Hydraulic calculations using the peak 100-year design discharge were performed to ensure adequate conveyance for these cutouts.

This report was prepared in accordance with the City of Chula Vista Subdivision Manual (dated July 1, 2002) and specifically, the pertinent criteria within Section 3-200 Hydrology/Drainage/Urban Runoff. Additionally, for criteria within the Chula Vista Manual where direction is not specific, methodology presented within the County of San Diego Hydrology Manual (dated June 2003) and the County of San Diego Drainage Design Manual (dated July 2005) was followed.

1.2 Project Area

As previously mentioned, the on-site hydrologic and hydraulic calculations presented in this report analyze approximately 23.5 acres. This area is bound on the east by Bay Boulevard, on the south by a commercial/industrial park, on the west by salt evaporation ponds, and to the north by the northerly liquefied natural gas (LNG) containment berm. Overall, the site features elevations ranging between 12 feet and 22 feet (NAVD 88) and mild slopes (less than one percent) that generally drain westerly. Vegetative cover principally consists of native grasses, shrubs, with various areas of delineated wetlands. The aforementioned LNG plant containment area is the most prominent on-site feature.

Historical research of aerial photography conducted by NV5 indicates that the LNG plant was constructed in a phased manner starting in the mid-1960s. At that point in time, there was one LNG tank with a small containment berm. By the early-1970s, two LNG tanks and a containment berm configuration similar to what remains today can be seen. In 1989, the plant was abandoned and deconstructed. In its current state, the plant consists of two large circular concrete foundations for the old LNG storage tanks. Surrounding the LNG foundations is an earthen containment berm that encompasses approximately 9.8 acres, varies in height from five to ten feet, features slopes of approximately 2H:1V, and has a top width that averages approximately 12 feet. Elevations within the berm range from approximately 16 feet at the northern end to 8 feet (NAVD 88) at the southwestern corner.



Source: Topo! and USGS

Figure 1: Vicinity Map

2.0 ON-SITE HYDROLOGY

2.1 Methodology

The 23.5 acre on-site area is classified as a Local Drainage Basin by the City of Chula Vista Subdivision Manual because it is less than the 100-acre maximum threshold. Consequently, Section 3-203.2 of the Manual requires peak flow rates to be calculated using the Rational Method. The Advanced Engineering Software (AES) version 20.0 (2013) software program was used to perform these computations.

Rational Method:

$$Q = CIA$$

where:

Q	Peak Discharge (cfs)
C	Runoff coefficient (unitless)
I	Average rainfall intensity in inches per hour for a storm duration equal to the time of concentration (T_c) of the contributing drainage area (in/hr)
A	Drainage area tributary to design point (acres)

<u>Peak Discharge, Q</u>

The 100-year, 6-hour peak discharge rates were calculated and are presented within this report.

<u>Runoff Coefficient, C</u>

Runoff coefficients in Section 3-203.2 of the City of Chula Vista Subdivision Manual were used for this study. The asphalt concrete access roads were given a value of 0.9, Class II base areas a value of 0.75, and natural areas a value of 0.35. Because the hydrologic soil type is undefined at the project site (County of San Diego Hydrologic Soil Group Map using USDA/NRCS SSURGO Soils 2007), a conservative approach to runoff values was taken, which corresponded to Type D soils as shown in Table 3-1 of the County of San Diego Hydrology Manual.

Composite runoff values were calculated for the respective sub-area using a weighted average per the following equation:

$$\text{Composite C-value} = [(Area_n \times C_n) + (Area_{n+1} \times C_{n+1}) + \ldots] / (Area_n + Area_{n+1} + \ldots)$$

Rainfall Intensity, I

Using the computed time of concentration and 6-hour precipitation, the rainfall intensity is obtained from the Intensity - Duration Chart within the AES program. This chart uses the following equation:

$$I = 7.44P_6D^{-0.645}$$

where:

I	Intensity (inches/hour)
P_6	6-hour precipitation from Chula Vista Isopluvials
D	Duration equal to the time of concentration (minutes)

100-year Rainfall: P_6 = 2.6 inches

Drainage Area, A

Sub-areas were delineated (in acres) to determine flow rates at various points of interest (nodes). See Figures 2 and 3 for illustrations of these boundaries and node locations for the various pre-project and post-project conditions.

2.2 Pre-Project Conditions

As discussed in Section 1.2, the site includes the bermed area around the abandoned LNG tank foundations and a large depressed area near the southwest corner of the site. Outlet locations for flow are at the Northwest Corner and Southwest Corner.

Flow within the 9.8 acre bermed area for the abandoned LNG plant drains towards its southwesterly corner, where it ultimately ponds. Site visits conducted in March 2010 showed evidence of this ponding. Through both infiltration and evaporation processes, this ponded water dissipates as verified during subsequent site visits in the summer of 2010. Furthermore, based on the large amount of available volume within the bermed area and the absence of exterior tributary flow entering this area, it is assumed that the 100-year flood volume is completely retained in this area. Thus, this area is excluded from the on-site hydrologic calculations for this scenario. After factoring in this area exclusion, the peak discharge values for the Southwest Corner and Northwest Corner outlets were then determined.

The hydrologic sub-area delineation for the Southwest Corner outlet analysis can be seen in Figure 2. Sub-area specific input values such as area, length, runoff coefficient, and upstream/downstream node elevations can be found in Appendix A. Using AES, it was determined that approximately 12.7 acres, generating a 100-year peak discharge rate of approximately 9.0 cubic-feet-per-second (cfs) and a 33 minute time of concentration drains into the depressed area prior to discharging at the Southwest Corner. The corresponding 6-hour inflow hydrograph yielded a 100-year inflow volume of approximately 0.95 acre-feet.

Based on existing topographic data (NAVD 88 dated August 2010) the depressed area has an invert elevation of approximately 12 feet and will start discharging stormwater at the southwestern corner once water surface elevations reach approximately 14 feet. At 14 feet, the depressed area was determined to have a volume of approximately 0.33 acre-feet. The outlet geometry assumed a contracted weir section with a 20-foot weir crest length and weir coefficient of 2.6.

Using the aforementioned inflow hydrograph, basin volume, and outflow geometry, Bentley System's Pondpack (version 8i) was used to perform the storage routing calculations. This analysis followed methodology outlined in the County of San Diego Drainage Design Manual. The results of this analysis indicate that approximately 6.3 cfs discharges at the Southwest Corner for the 100-year flood event. Thus, it can be seen that this depressed area attenuates approximately 2.7 cfs, or 30 percent, of the peak 100-year inflow.

At the Northwest Corner, a Rational Method analysis was conducted and determined that approximately 1.0 acres generates 1.0 cfs of discharge for the 100-year storm event. These basin delineations can also be seen in Figure 2.

2.3 Post-Project Conditions

The development of the project site as it pertains to drainage includes imported fill, increased impervious area due to asphalt concrete access roads, a water quality basin, and a wetland area. This post-project condition ultimately results in three main flow paths through the site. As seen in Figure 3, these flow paths correspond to drainage basins labeled 100, 200, and 300.

Basin 100 features portions of increased impervious area from the proposed access roads, grading modifications due to the substation pad, a channel on the eastern side of the pad, and a wetland area south of the pad. Discharge travels to the southern portion of the site before continuing westerly to the wetland area. Approximately 9.20 cfs enters this wetland area for the 100-year storm event. This area provides approximately 0.05 acre-feet of storage (at elevation 10.25 feet). Storage routing calculations were performed to determine the peak outflow at node 112 assuming a five foot contracted weir section at an elevation of 10.25 feet. The results of these calculations show that for the 100-year storm event, approximately 7.4 cfs discharges from the wetland area, and travels 73 feet to the Southwest Corner outlet location (node 113). The total area tributary to the Southwest Corner from Basin 100 is approximately 9.0 acres. Ultimately, this peak discharge confluences with the outflow from the water quality basin (see Table 3) to determine the total flow at the Southwest Corner outlet location.

Basin 200 is comprised of the portion of the substation pad within the masonry screen wall and the western water quality basin. Flow generated from the substation pad generally travels westerly along the asphalt concrete access roads before entering the water quality basin through three wall cutouts. Cover types for the substation pad area are asphalt concrete and Class II base. The water quality basin area features a pervious bottom with concrete side slopes (1.5H:1V). The tributary area to the water quality basin (including the basin itself) is approximately 10.4 acres. Peak inflow values to the water quality basin for the 100-year storm event is shown in Table 1.

Table 1: Water Quality Basin Inflow (from Basin 200)

Storm event (6-Hour)	100-Year
Peak Discharge (cfs)	38.8
Time of Concentration (min)	8.5

The AES model output for Basin 200 was then used in conjunction with the proposed water quality basin characteristics to determine attenuation time and outflow values (Section 4.1 goes into further detail regarding this analysis) from the water quality basin. These values, in addition to those from the Basin 100 wetland area evaluation, were then entered as user defined inflow data to an AES model for confluence at Node 113. The resulting peak discharge values plus the underdrain discharge (shown in Table 2) are considered the final results to be compared with the pre-project condition values.

Basin 300 encompasses the remaining portions of the LNG plant containment area not affected by Basins 100 and 200. Sections of the containment berm and existing ground are proposed to be regraded such that runoff will travel westerly to the Northwest Corner discharge location (Node 304). This results in approximately 4.1 acres of tributary area to this location. Peak flow rates at this location are summarized in Table 2.

Table 2: Peak Flow Rate Summary

Location	Pre-Project	Post-Project
	100-Year	100-Year
Southwest Corner	6.3 cfs	10.6 cfs
Northwest Corner	1.0 cfs	4.0 cfs

See Appendix A for all AES input values and output results.

3.0 OFF-SITE HYDROLOGY

The off-site area which drains to the proposed entrance road culvert crossing is approximately 122.8 acres and as such, is classified by the City of Chula Vista Subdivision Manual as a Lateral Drainage Basin. From Section 3-203.2 of the Manual, this classification requires the Natural Resource Conservation Service (NRCS) methodology to be used. The Army Corps of Engineers (ACOE) HEC-HMS version 3.5 (2010) software package was used to calculate peak 100-year, 24-hour discharge values.

3.1 Methodology

Similar to the analyses described in Section 2.0, sub-areas were delineated, in square miles, based on existing topography, land use, slope, existing drainage infrastructure, and locations of interest, for input into the model. This process is further discussed in Section 3.2 and illustrated in Figures 4 and 5.

Following delineation of the sub-areas, time of concentration values were calculated using flow path lengths from the most remote sub-area location to the confluence node at the downstream point in the respective sub-area. Time of concentration can then be related to lag time, which is required by HEC-HMS for its computations. Generally, flow through a sub-area can be classified as sheet flow, shallow concentrated flow, and concentrated (channel or pipe) flow. Sheet flow lengths were limited by land characteristics (i.e. land use, slope, etc) and maximum lengths from Table 3-2 in the San Diego County Hydrology Manual. Channel and pipe flow time of concentrations were estimated from velocities using Manning's equation. The Bentley System's FlowMaster (version 8.11) software program was used to perform these computations. Sheet flow and shallow concentrated flow were calculated using the relationships shown below.

Sheet Flow Equation (Overton and Meadows)

$$t = [0.007(n * L)^{0.8}]/(P_2^{0.5} S^{0.4})$$

where:

t	Travel time (hours)
n	Manning's roughness coefficient
L	Flow path length
P_2	2-Year, 24-Hour rainfall total (inches)
S	Slope (feet per feet)

Shallow Concentrated Flow Equation (NRCS)

$$\text{Unpaved: } V = 16.1345 * S^{0.5}$$
$$\text{Paved: } V = 20.3282 * S^{0.5}$$

where:

V	Average velocity (feet per second)
S	Slope (feet per feet)

and;

$$t = L / V$$

where:

L	Flow path length (feet)
V	Average velocity (feet per second)

Once the time of concentration values were determined, they were converted to NRCS lag values using the following relationships presented in the County of San Diego Hydrology Manual:

$$Lag_{NRCS} = T_p - D/2$$
$$T_p = 0.67T_c$$
$$D = 0.2T_p$$

where: T_p = Time to peak
T_c = Time of concentration
D = Period of effective rainfall

Precipitation data for the storm frequencies of interest were obtained from the Isopluvials available in the County of San Diego Hydrology Manual. For example, the 100-year storm event for the 6-hour and 24-hour durations had precipitation totals of 2.6 inches and 4.5 inches, respectively. Following County methodology for a nested storm, the rainfall totals are distributed over a 24-hour duration, adjusted using a depth-area factor, calculated for incremental change, and then ordered using a 2/3 , 1/3 distribution.

Excess rainfall is calculated using the NRCS curve number methodology. This methodology is principally based on land use, soil type, antecedent moisture condition, storm duration, and volume. Land use classifications were determined from aerial imagery, site visits, and City of Chula Vista data. Based on this review, four major land use classifications were used in the analysis: Streets and Roads, Commercial and Business, Dense Residential, and Natural (poor) cover. The soil group of "D" was selected from the Manual's Hydrologic Soil Group map. Entering Table 4-2 in the County of San Diego Hydrology Manual, curve numbers of 98, 95, 92, and 89, respectively, were chosen to correspond to the aforementioned land uses. Composite curve numbers were then calculated based on a weighted average for each sub-area. These values were adjusted for the Precipitation Zone Number (PZN) of 2.5 since the area is in the Coastal Zone (per Figure C-1 in the County of San Diego Hydrology Manual) and the design storm is above the 35-year return period threshold. These adjustments can be seen in Appendix B.

Finally, the Muskingum-Cunge method was used to route and attenuate flood hydrographs through the sub-basins. This method is appropriate for a variety of channel slopes and mainly relies upon measureable physical input parameters such as channel slope, reach length, and channel geometry.

3.2 Existing Conditions

The 122.8 acre area tributary to the proposed entrance road culvert crossing is mainly located east of Bay Boulevard. The area is almost completely developed as a majority of its land use can be classified as commercial/industrial or dense residential. Consequently, this analysis was based on the existing conditions data provided by the City of Chula Vista. The information used for sub-basin delineations were two-foot contour topography (NAVD 88) based on 2004 orthophotography, aerial imagery, storm drain pipes and inlets, drainage basins, and various site visits. The topography and aerial imagery were acquired from the City of Chula Vista Geographical Information Systems Department while the storm drain information was publicly available on the City's website.

The sub-basin areas and major flow path lengths and directions can be seen in Figure 4. Elevations range from 56 feet at the headwaters to approximately 13 feet near the culvert. Sub-area runoff generally travels overland, in a westerly direction, before being capture by various storm drain inlets. Flow then continues westerly via underground storm drain pipes before discharging into the drainage ditch on the western side of Bay Boulevard. The drainage ditch directs flow to the south and ultimately, through the proposed culvert.

The resultant peak 100-year, 24-hour discharge rates upstream and downstream of the culvert are approximately 326.3 cfs and 335.3 cfs, respectively. All input parameters and HEC-HMS model results are located in Appendix B.

4.0 HYDRAULICS

4.1 Water Quality Basin Analysis

The proposed water quality basin located along the western side of the site functions both as a water quality and flood control basin. This report is principally concerned with evaluating the proposed water quality basin from a flood control perspective in order to mitigate peak post-project discharge values. This analysis was performed using Pondpack and requires an inflow hydrograph, basin volume, an outflow mechanism, and infiltration characteristics as input requirements.

The inflow hydrograph was developed from the AES analysis described in Section 2.3. The results from this analysis, which included time of concentration, 6-hour rainfall, basin area, composite runoff coefficient, and peak discharge, were required to generate the 6-hour hydrograph.

The available volume for the basin was calculated on an elevation per area basis using the proposed grading. The area (acres) at each contour (one-foot intervals) was calculated and a rating curve was developed from the invert (13 feet) of the basin to its maximum height (16 feet). Pondpack then interpolates linearly between these contours to compute the storage volume.

Due to the hydromodification requirements presented in the City of San Diego Hydromodification Management Plan (May 2009), the basin has an 18-inch thick minimum soil mixture that is designed to maintain a five-inch-per-hour infiltration rate. This infiltration rate was converted into a volumetric flow rate of 3.5 cfs using the basin bottom of 30,270 square-feet. Three, eight-inch perforated PVC underdrains are proposed at a 0.11 percent slope to capture the infiltrated runoff. Using Manning's equation, it was determined that each pipe can accommodate 0.37 cfs for a total of 1.11 cfs. When compared to the soil infiltration rate, this value would be considered the limiting flow rate. Thus, 1.11 cfs was the input value used for the model infiltration parameter.

The primary outflow structure for the basin is a one foot long contracted weir. The weir is located on the southern side of the basin and is at an elevation of 14 feet. The weir geometry is input into Pondpack which calculates the outflow based upon the computed head using the standard weir equation and free outfall assumption.

The 100-year, 6-hour peak inflow and volume to the basin were approximately 38.8 cfs and 1.7 acre-feet, respectively. Approximately 1.3 acre-feet of stormwater discharges via infiltration, while the remaining 0.4 acre-feet is conveyed through the weir structure. Approximately 2.1 cfs passes over the weir before it confluences with the unmitigated on-site flow. The spillway is concrete lined to protect against erosion during large storm events. In the event the primary outlet weir is not functioning, an emergency spillway located approximately 0.75 feet above the primary spillway will release stormwater into the outflow channel.

The water quality basin drains in approximately 15 hours and has a maximum 100-year ponded water surface elevation of 14.6 feet, providing approximately 1.4 feet of freeboard. When considering only the emergency spillway, the 100-year water surface elevation is 14.8 feet, providing approximately 1.2 feet of freeboard. The results of the water quality basin analysis are included in Appendix C and summarized in Table 3.

Table 3: Water Quality Basin Outflow Summary

Storm event (6-Hour)	100-Year
Weir (cfs)	2.1
Underdrain (cfs)	1.1

4.2 Entrance Road Culvert Analysis

[COMPLETED AT A LATER DATE]

4.3 On-site Access Road Culvert Analysis

The drainage swale that conveys flows in a southerly direction along the eastern substation pad toe of slope crosses the three access roads entrance locations to the pad. Labeled from north to south using the hydrologic nodes, these locations are at Node 108 (Access Road A), 109 (Access Road B), and 110 (Access Road C) (see Figure 3). Extending east, Access Road C turns into Access Road D, the main entrance road, which crosses a culvert to eventually confluence with the drainage swale along the substation pad.

Using the appropriate 100-year peak discharge value and downstream boundary condition (based on normal depth calculations), high-density polyethylene (HDPE) culverts with headwalls (0.5 entrance loss coefficient) were sized using Bentley System's CulvertMaster (version 3.3). CulverMaster uses the Federal Highway Administraton's (FHWA) Hydraulic Design of Highway Culverts (HDS-5) inlet and outlet control computation procedures to determine headwater elevation. This is consistent with the methodology presented in the County of San Diego's Drainage Design Manual.

The results of this analysis support the use of 18-inch, 24-inch, 24-inch, and 18-inch diameter culverts located at Nodes 108, 109, 110, and 103, respectively. Using these dimensions, headwater elevations do not pond above the top of the culvert.

The results of these analyses are included in Appendix E.

4.4 Screen Wall Slot Analysis

There are four proposed screen wall slots at various locations around the substation pad. Three of these locations are along the western side of the screen wall and allow discharge generated from the pad into the water quality basin. Looking at Figure 3 from north to south, these locations have been labeled 202, 214, and 223. The fourth location near 111, is in the southeast corner of the substation and drains approximately 0.6 acres to the swale that ultimately discharges at the Southwest Corner outlet.

Location 202, 214, and 223 were analyzed as rectangular orifices using FlowMaster. At location 111, an orifice and weir calculation were performed because the flow type transition from weir to orifice is ambiguous. Thus, a precise ponded water elevation is difficult to predict, but can generally be estimated at no greater than 0.85 feet (weir equation headwater depth).

Geometry was determined from incremental 8”x16” blocks. Because debris bars are proposed at each slot, a 50 percent blockage factor was applied to the calculations by bulking the applicable flow by 100 percent. Appendix F includes the FlowMaster summary tables.

The following dimensions (Length x Height) for the wall slots were ultimately proposed:

Location 202: 32” x 8”
Location 214: 192” x 8”
Location 223: 80” x 8”
Location 111/Area 112: 16” x 8”

5.0 CONCLUSIONS

When evaluating the hydrologic impacts of the proposed Bay Boulevard substation, the Northwest Corner and Southwest Corner outfall nodes are considered the points of comparison. At the Northwest Corner, when considering the 100-year flow, the post-project conditions increase the discharge by approximately 3.0 cfs. At the Southwest Corner, the 100-year flow increases by approximately 4.3 cfs.

Ultimately, the water quality basin attenuates a large portion of the flow generated from the substation pad. However, the channelization of runoff around the substation pad perimeter toe of slope generally increased velocities and thus, decreased the time of concentration. This decrease in time of concentration, which is associated with an increase in rainfall intensity, combined with an increase in the composite runoff coefficient, increases the peak flow rate prior to its confluence with the water quality basin outflow. This increase is enough that despite the significant mitigation from the water quality basin, flow increases compared to the pre-project conditions.

It should be noted that the ultimate destination for the Southwest Corner discharge is the salt evaporation ponds and by extension, San Diego Bay. Additionally, the Northwest Corner eventually discharges to the San Diego Bay. Due to the extremely large volume of water present within San Diego Bay, it is the opinion of this report that this small increase will not impact the water surface elevation of the Bay.

6.0 REFERENCES

1. Automatic Engineering Systems (AES) Rational Method Analysis. Version 20.0, June 2013

2. Bentley CulvertMaster. Bentley Systems Inc., Version 3.3, November 2009.

3. Bentley FlowMaster V8i. Bentley Systems Inc., Version 8.11, November 2009.

4. Bentley PondPack V8i. Bentley Systems Inc., Version 8.11, March 2012

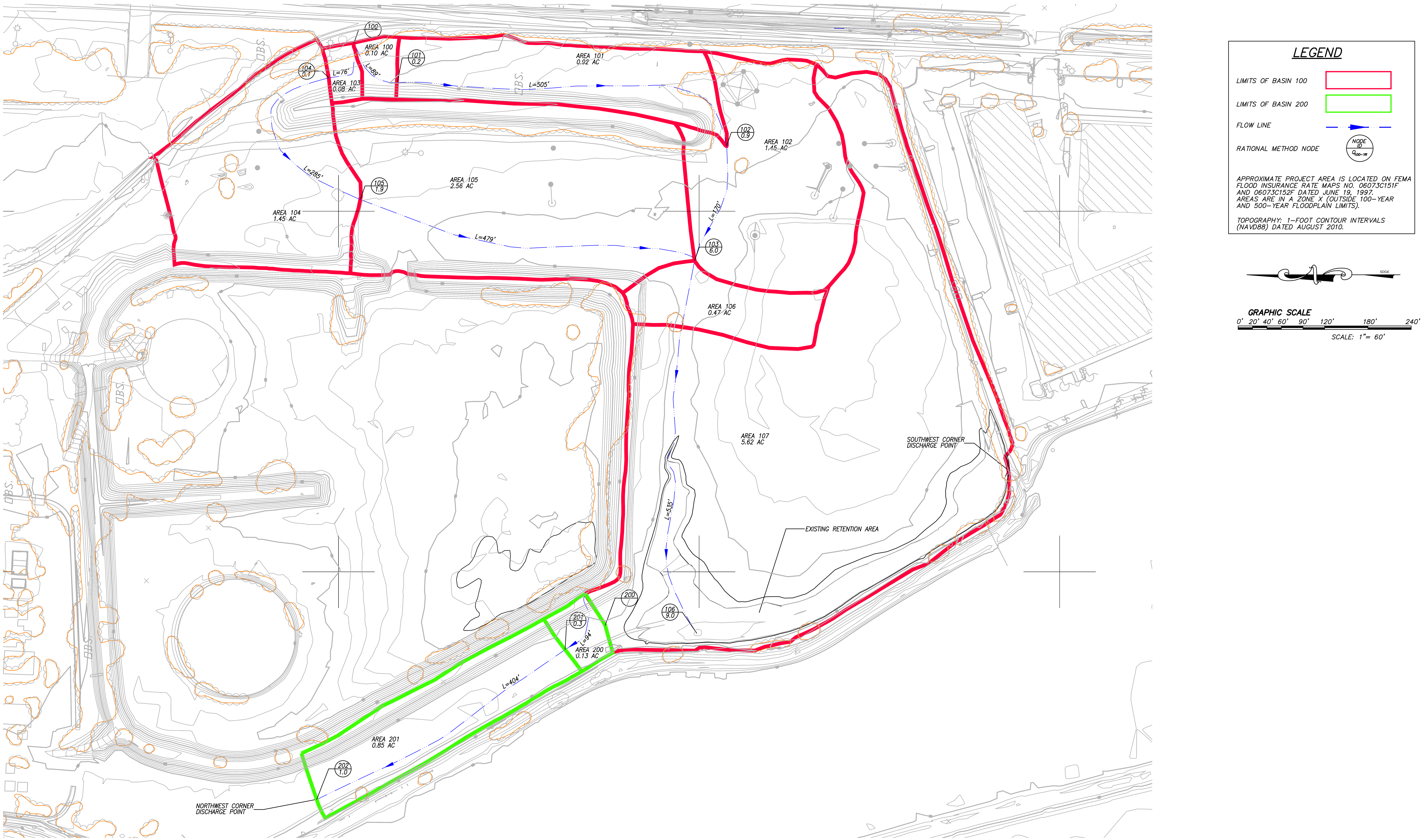
5. City of Chula Vista Subdivision Manual. City of Chula Vista, July 2002

6. Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS). U.S. Army Corps of Engineers, Version 3.5, August 2010.

7. Hydrologic Engineering Center River Analysis System (HEC-RAS). U.S. Army Corps of Engineers, Version 4.1.0, January 2010.

8. San Diego County Drainage Design Manual. County of San Diego Department of Public Works, July 2005.

9. San Diego County Hydrology Manual. County of San Diego Department of Public Works, June 2003.



NV5
BEYOND ENGINEERING

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP

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ON-SITE HYDROLOGY WORKMAP
FIGURE 2: PRE-PROJECT CONDITIONS

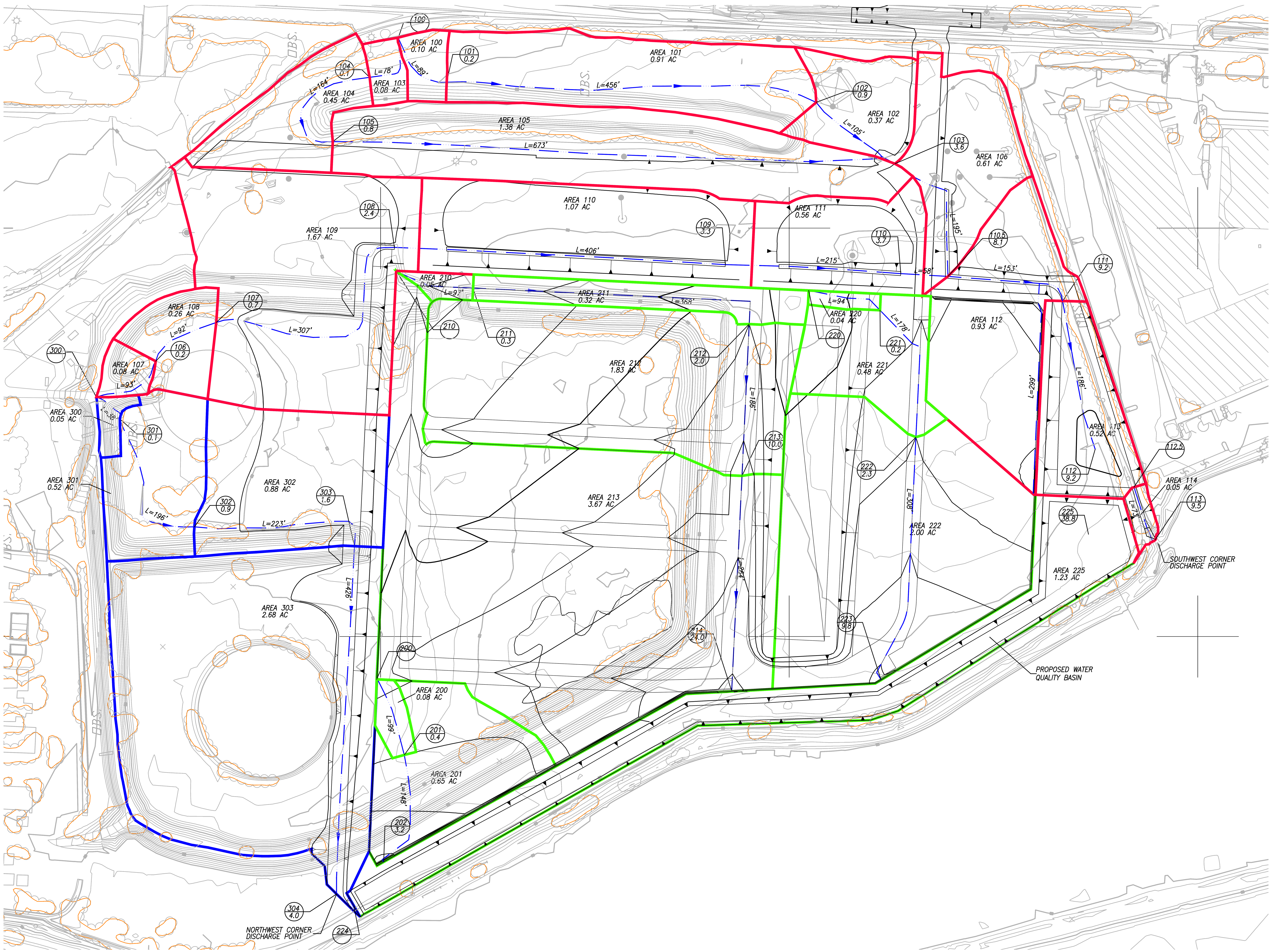
SAN DIEGO GAS & ELECTRIC COMPANY
SAN DIEGO, CALIFORNIA

BAY BOULEVARD SUBSTATION

DRAWN BY: B&V RCF | DATE: 03/20/12 | SCALE: 1"=60' | W.O. | REV. 12/10/2013
CHECKED BY: | DATE:
APPROVED BY: | DATE:
CAD NO.: | PLOT SCALE: 1" = 1'

SDB058900

12/10/13



LEGEND

LIMITS OF BASIN 100

LIMITS OF BASIN 200

LIMITS OF BASIN 300

FLOW LINE

RATIONAL METHOD NODE

APPROXIMATE PROJECT AREA IS LOCATED ON FEMA FLOOD INSURANCE RATE MAP NOs. 06073C2151F AND 06073C2152F DATED JUNE 19, 1997. AREAS ARE IN AN UNSHADED ZONE X (OUTSIDE 500-YEAR FLOODPLAIN LIMITS).

GRAPHIC SCALE

0' 20' 40' 60' 90' 120' 180' 240'

SCALE: 1"= 60'

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ON-SITE HYDROLOGY WORKMAP
FIGURE 3: POST-PROJECT CONDITIONS

SAN DIEGO GAS & ELECTRIC COMPANY
SAN DIEGO, CALIFORNIA

BAY BOULEVARD SUBSTATION

DRAWN BY: B&V RCF | DATE: 03/20/12 | SCALE: 1"=60' | W.O. | REV. 12/10/2013
CHECKED BY: | DATE:
APPROVED BY: | DATE:
CAD NO.: | PLOT SCALE: 1" = 1'

SDB058900

12/10/13

LEGEND

LIMITS OF BASIN	
ROUTING FLOW LINE	
HEC–HMS NODE	NODE ID $Q_{100\text{-}YR}$
STORM DRAIN LINE	
STORM DRAIN INLET	

GRAPHIC SCALE

0' 200' 400' 600' 800'

SCALE: 1"= 200'

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OFF-SITE HYDROLOGY WORKMAP

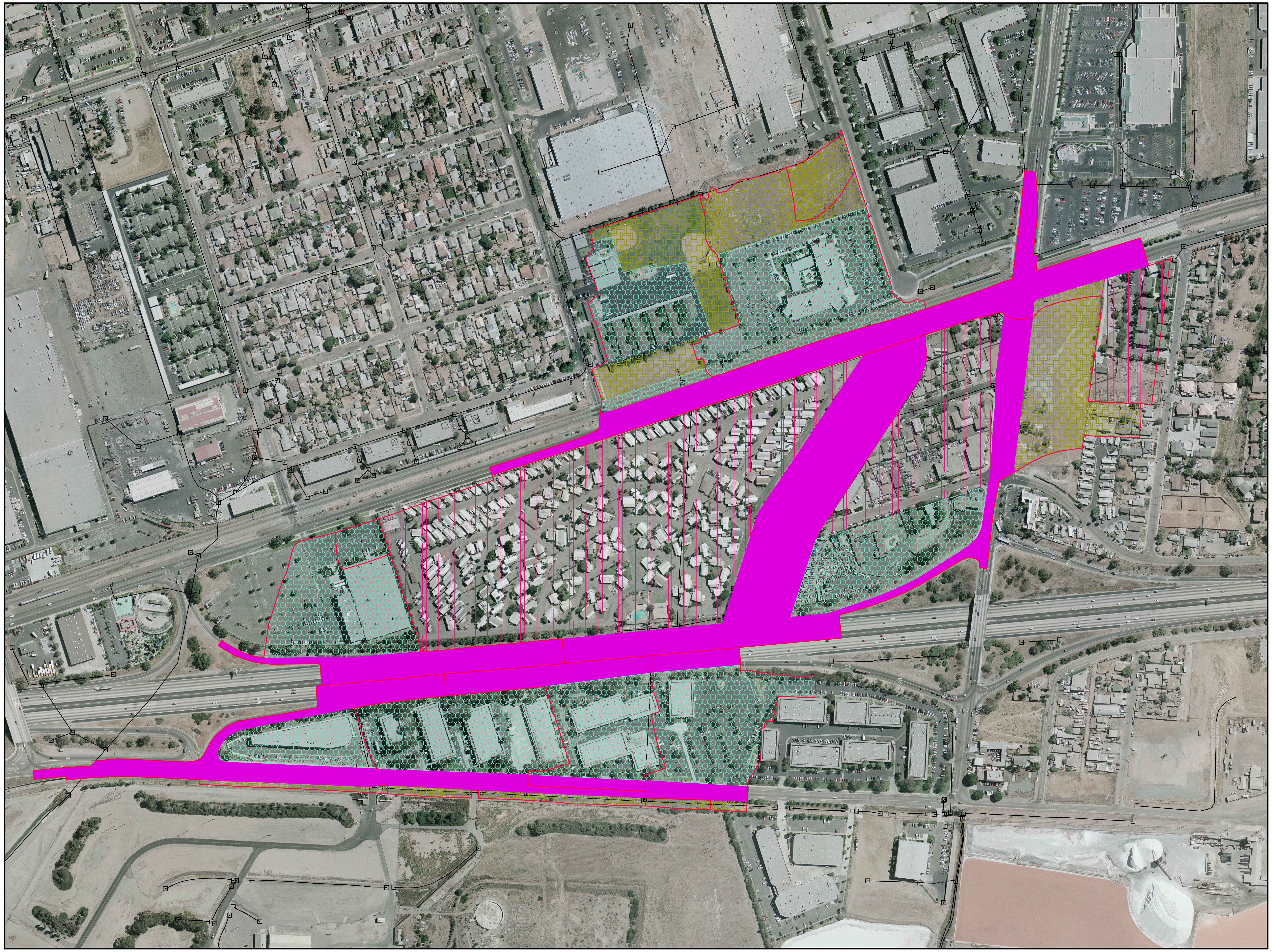
FIGURE 4: OFF-SITE CONDITIONS

SAN DIEGO GAS & ELECTRIC COMPANY
SAN DIEGO, CALIFORNIA

BAY BOULEVARD SUBSTATION

DRAWN BY: B&V RCF	DATE: 03/20/12	SCALE: 1"=200'	W.O.	REV. 12/10/2013
CHECKED BY:	DATE:		SDB058900	
APPROVED BY:	DATE:			
CAD NO.:	PLOT SCALE: 1' = 1'			

12/10/13



LEGEND

- STREET & ROADS
- COMMERCIAL & BUSINESS
- NATURAL (POOR) COVER
- DENSE RESIDENTIAL

GRAPHIC SCALE

0' 200' 400' 600' 800'

SCALE: 1"= 200'

N|V|5
BEYOND ENGINEERING

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP

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OFF-SITE HYDROLOGY WORKMAP

FIGURE 5: OFF-SITE LAND USE MAP

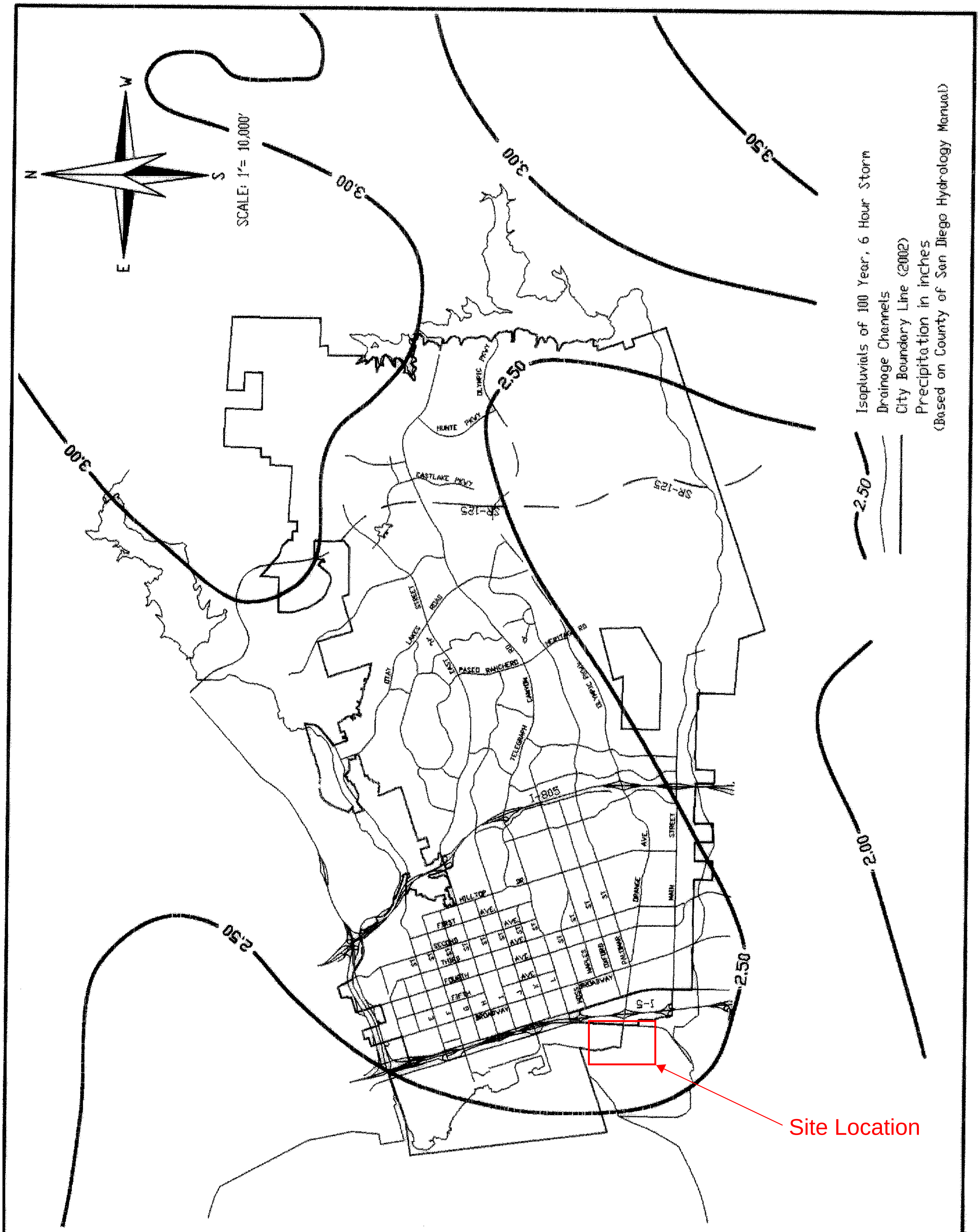
SAN DIEGO GAS & ELECTRIC COMPANY
SAN DIEGO, CALIFORNIA

BAY BOULEVARD SUBSTATION

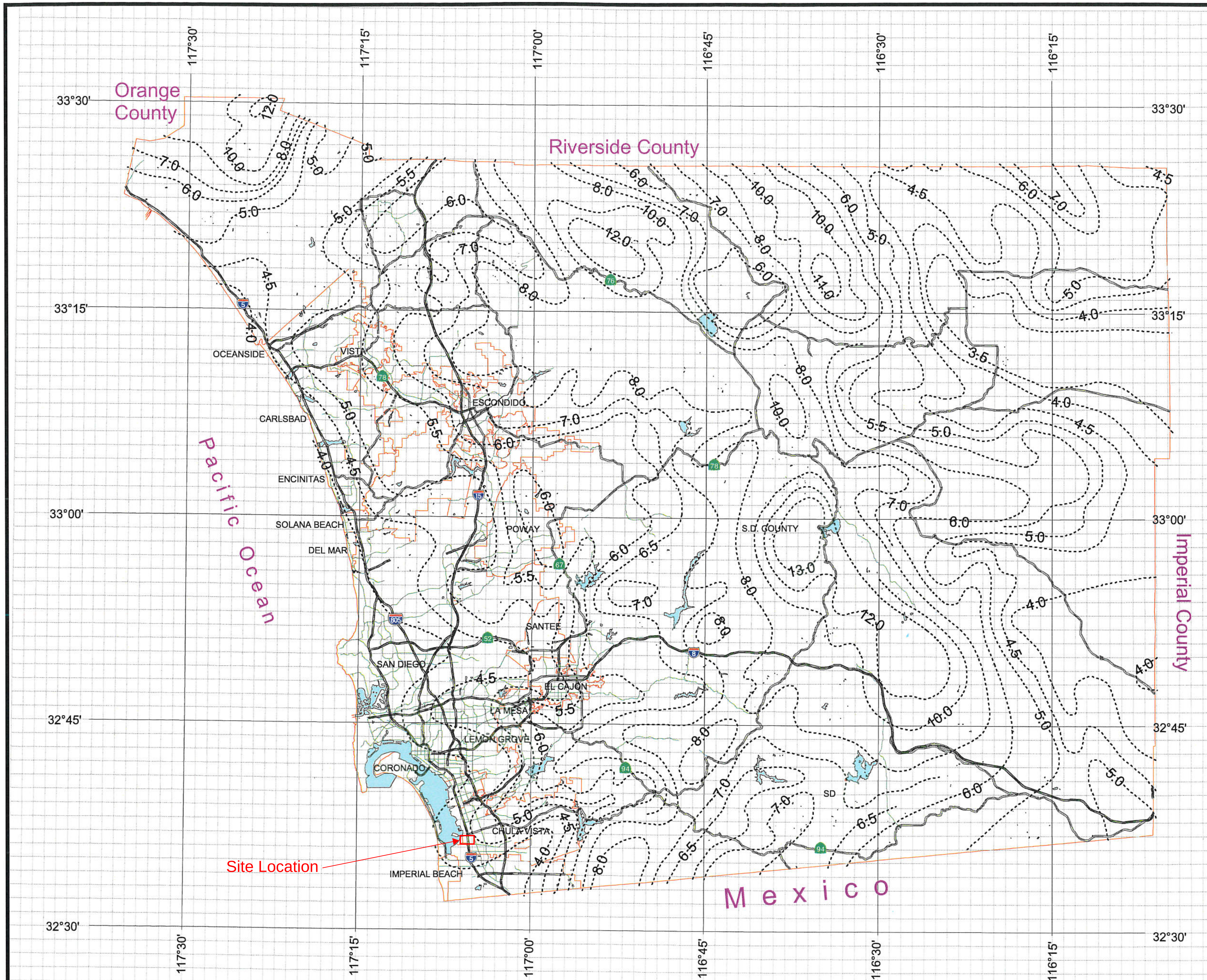
DRAWN BY: B&V RCF	DATE: 03/20/12	SCALE: 1"=200'	W.O.	REV. 12/10/2013
CHECKED BY:	DATE:		SDB058900	
APPROVED BY:	DATE:			
CAD NO.:	PLOT SCALE: 1' = 1'			

12/10/13

APPENDIX A



Revised:	Original approval date: 01-29-02	CITY OF CHULA VISTA PUBLIC WORKS DEPARTMENT
M.P.M 2-02	Redrawn By: C.V.M. Date: 01-29-02	
	CITY ENGINEER Date: 11-7-02	100 YEAR, 6 HOUR PRECIPITATION — CVD-DR05



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

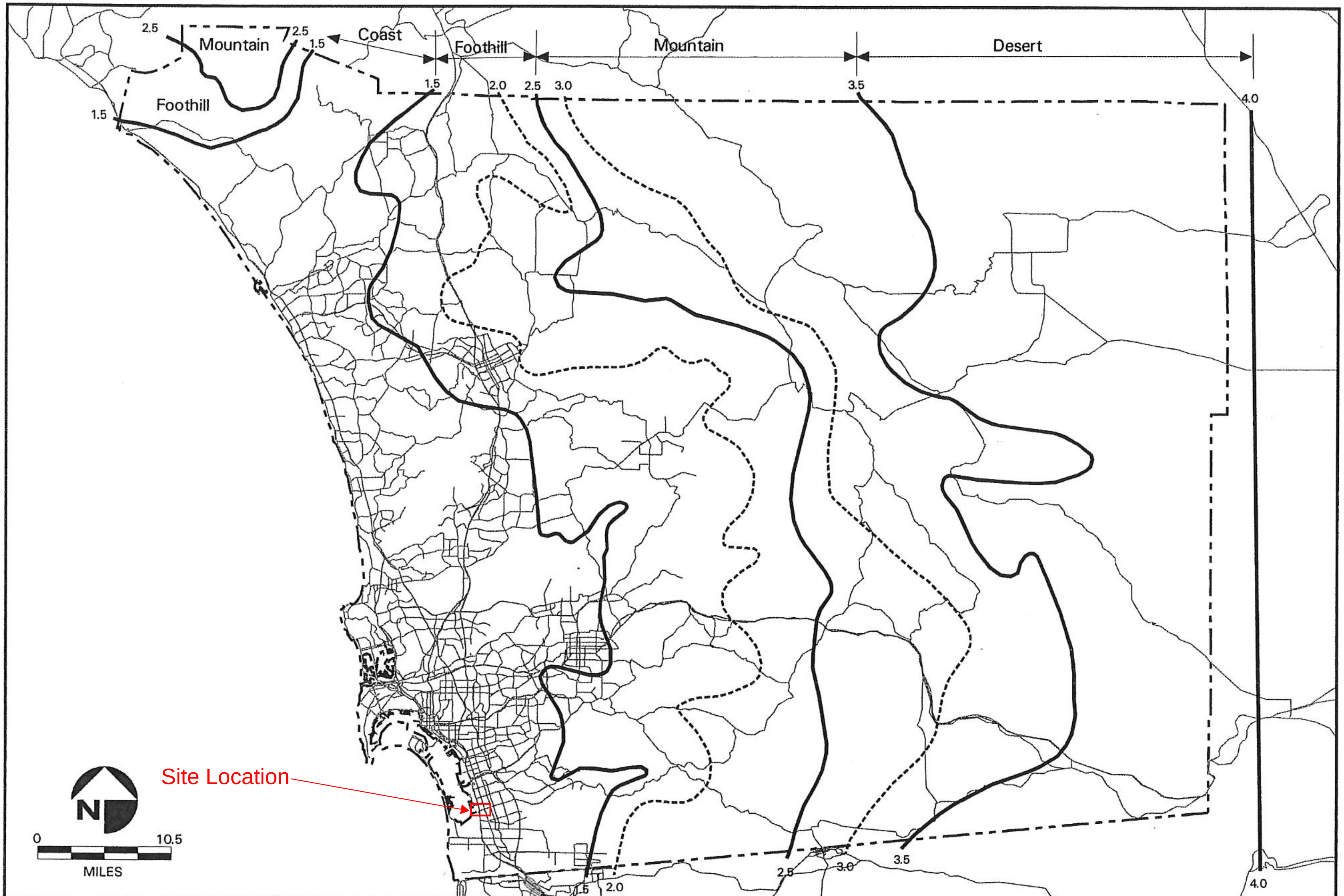
Isopluvial (inches)

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N
W E
S

3 0 3 Miles



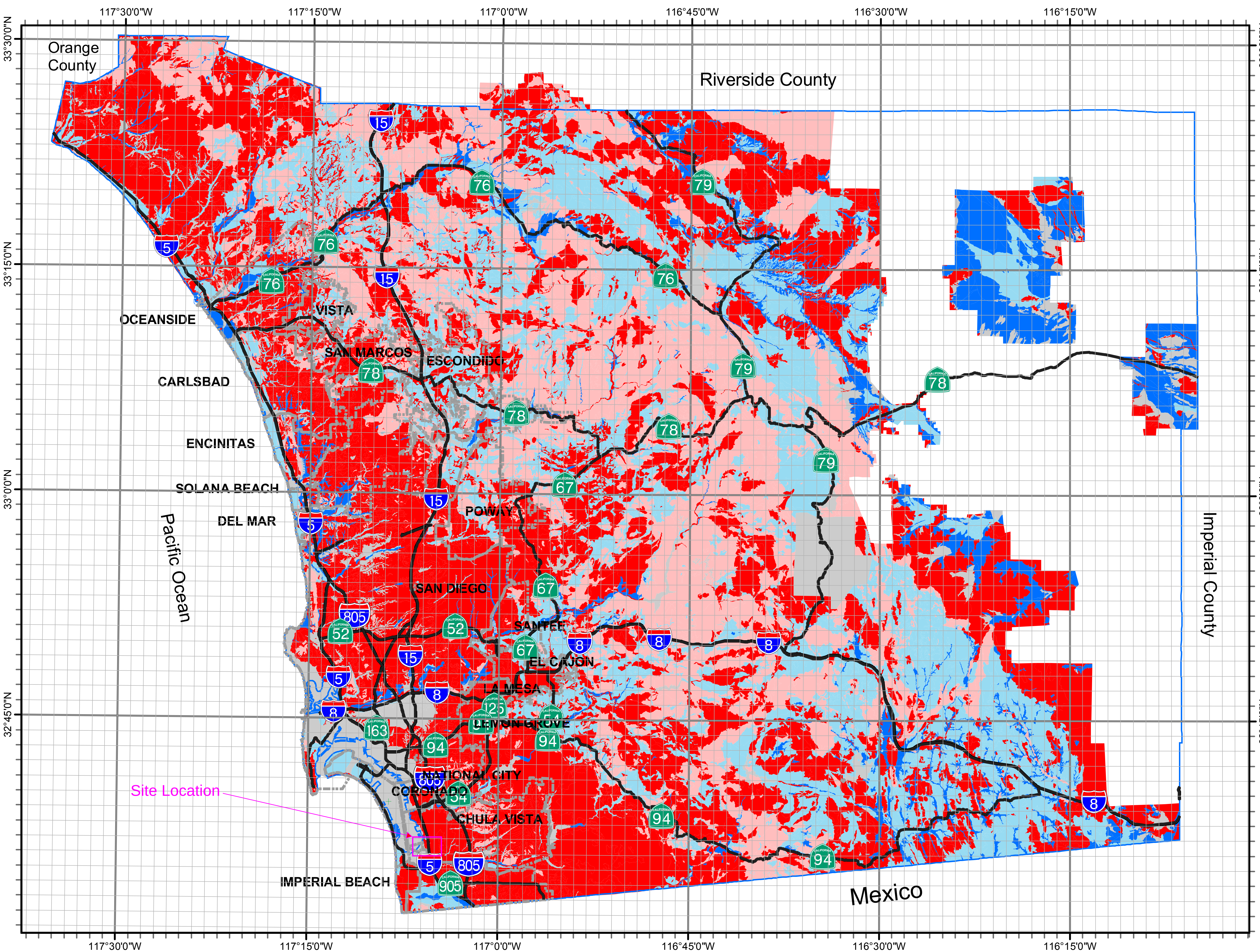
FIGURE

C-1

County of San Diego Hydrology Manual

Precipitation Zone Numbers (PZN)

County of San Diego Hydrology Manual Soil Hydrologic Group



Legend

- Major Roads
- Incorporated City Bdy

HYDROLOGIC SOIL GROUP

- Hydrologic Group Undefined
- Hydrologic Group A
- Hydrologic Group B
- Hydrologic Group C
- Hydrologic Group D
- No Soil Data

Note: Soil Data Source
USDA/NRCS
SSURGO Soils 2007

N

3 1.5 0 3 Miles

RATIONAL METHOD INPUT DATA - PRE-PROJECT CONDITIONS

Subarea	Area (ft^2)	Area (Acres)	Upstream Node	Downstream Node	Upstream Elevation (ft)	Downstream Elevation (ft)	Length (ft)	Natural Cover Area	AC Paved Area	Commercial Area	Dense Residential	C-Value
100	4441.45	0.10	100	101	21.8	20	89	0.10	0.00	0.00	0.00	0.35
101	40292.70	0.92	101	102	20	15.7	505	0.92	0.00	0.00	0.00	0.35
102	63103.12	1.45	102	103	15.7	14.2	170	1.45	0.00	0.00	0.00	0.35
103	3488.07	0.08	100	104	21.8	20.5	76	0.08	0.00	0.00	0.00	0.35
104	63199.77	1.45	104	105	20.5	16	285	1.45	0.00	0.00	0.00	0.35
105	111486.12	2.56	105	103	16	14.2	479	2.56	0.00	0.00	0.00	0.35
106	20489.70	0.47	NA	NA	NA	NA	NA	0.47	0.00	0.00	0.00	0.35
107	244618.21	5.62	103	106	14.2	12	535	5.62	0.00	0.00	0.00	0.35
200	5581.54	0.13	200	201	21	14.6	94	0.13	0.00	0.00	0.00	0.35
201	36972.04	0.85	201	202	14.6	13.6	404	0.85	0.00	0.00	0.00	0.35

```
********************************************************************************

             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
             Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                          2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2009 Advanced Engineering Software (aes)
              Ver. 16.0 Release Date: 04/01/2009  License ID 1504

                           Analysis prepared by:

                           Nolte Associates, Inc.
                          15070 Avenue of Science
                                 Suite 100
                            San Diego, CA 92128

--------------------------------------------------------------------------------
  FILE NAME: PRE100.DAT
  TIME/DATE OF STUDY: 09:37 09/07/2010
--------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.600
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

********************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    89.00
  UPSTREAM ELEVATION(FEET) =     21.80
  DOWNSTREAM ELEVATION(FEET) =     20.00
  ELEVATION DIFFERENCE(FEET) =      1.80
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.562
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.22
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.509
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.16
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     20.00  DOWNSTREAM(FEET) =     15.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   505.00   CHANNEL SLOPE =  0.0085
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.493
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.58
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =  14.41
  Tc(MIN.) =   23.97
  SUBAREA AREA(ACRES) =     0.92       SUBAREA RUNOFF(CFS) =    0.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.0         PEAK FLOW RATE(CFS) =       0.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   0.66
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     594.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     15.70  DOWNSTREAM(FEET) =     14.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   170.00   CHANNEL SLOPE =  0.0088
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.259
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.72
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   3.95
  Tc(MIN.) =   27.92
  SUBAREA AREA(ACRES) =     1.45       SUBAREA RUNOFF(CFS) =    1.15
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       1.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   0.79
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     764.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.10 TO NODE    103.10 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    104.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    76.00
  UPSTREAM ELEVATION(FEET) =     21.80
  DOWNSTREAM ELEVATION(FEET) =     20.50
  ELEVATION DIFFERENCE(FEET) =      1.30
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.819
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.66
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.433
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     20.50  DOWNSTREAM(FEET) =     16.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   285.00   CHANNEL SLOPE =  0.0158
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =  30.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.515
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.12
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   4.25
  Tc(MIN.) =   14.07
  SUBAREA AREA(ACRES) =     1.45       SUBAREA RUNOFF(CFS) =    1.78
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =       1.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   1.34
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     361.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     16.00  DOWNSTREAM(FEET) =     14.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   479.00   CHANNEL SLOPE =  0.0038
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.417
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.72
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =  11.08
  Tc(MIN.) =   25.15
  SUBAREA AREA(ACRES) =     2.56       SUBAREA RUNOFF(CFS) =    2.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        4.1        PEAK FLOW RATE(CFS) =       3.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   0.75
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     840.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    103.20 TO NODE    103.20 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        3.46    25.15       2.417        4.09
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.20 =    840.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        1.95    27.92       2.259        2.47
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.20 =    764.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1       5.22      25.15        2.417
     2       5.19      27.92        2.259

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.22   Tc(MIN.) =   25.15
  TOTAL AREA(ACRES) =        6.6

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.417
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    0.47   SUBAREA RUNOFF(CFS) =    0.40
  TOTAL AREA(ACRES) =        7.0   TOTAL RUNOFF(CFS) =       5.95
  TC(MIN.) =   25.15

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     14.20  DOWNSTREAM(FEET) =     12.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   535.00   CHANNEL SLOPE =  0.0041
  CHANNEL BASE(FEET) =   25.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.030
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.14
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   7.81
  Tc(MIN.) =   32.96
  SUBAREA AREA(ACRES) =     5.62       SUBAREA RUNOFF(CFS) =    3.99
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =       12.6         PEAK FLOW RATE(CFS) =       8.99
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   1.18
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =    1375.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       12.6  TC(MIN.) =     32.96
  PEAK FLOW RATE(CFS)   =       8.99
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

♀
```

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 9/7/2010
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 33 MIN.
6 HOUR RAINFALL 2.6 INCHES
BASIN AREA 12.6 ACRES
RUNOFF COEFFICIENT 0.35
PEAK DISCHARGE 8.99 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 33	DISCHARGE (CFS) = 0.7
TIME (MIN) = 66	DISCHARGE (CFS) = 0.8
TIME (MIN) = 99	DISCHARGE (CFS) = 0.9
TIME (MIN) = 132	DISCHARGE (CFS) = 1.1
TIME (MIN) = 165	DISCHARGE (CFS) = 1.2
TIME (MIN) = 198	DISCHARGE (CFS) = 1.8
TIME (MIN) = 231	DISCHARGE (CFS) = 2.4
TIME (MIN) = 264	DISCHARGE (CFS) = 8.99
TIME (MIN) = 297	DISCHARGE (CFS) = 1.4
TIME (MIN) = 330	DISCHARGE (CFS) = 1
TIME (MIN) = 363	DISCHARGE (CFS) = 0.7
TIME (MIN) = 396	DISCHARGE (CFS) = 0

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
100-year, 6-hour	Watershed - 100	0	0.954	4.400	8.99

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Out 10	Watershed - 100	0	0.624	4.590	6.34

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Node 106 (IN)	Watershed - 100	0	0.954	4.400	8.99	(N/A)	(N/A)
Node 106 (OUT)	Watershed - 100	0	0.624	4.590	6.34	14.25	0.528

```
********************************************************************************

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             Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                          2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 17.0 Release Date: 07/01/2010  License ID 1504

                            Analysis prepared by:

                            Nolte Associates, Inc.
                           15070 Avenue of Science
                                 Suite 100
                             San Diego, CA 92128

--------------------------------------------------------------------------------
  FILE NAME: PRE200.DAT
  TIME/DATE OF STUDY: 14:52 12/08/2010
--------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.600
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

********************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    94.00
  UPSTREAM ELEVATION(FEET) =     21.00
  DOWNSTREAM ELEVATION(FEET) =     14.60
  ELEVATION DIFFERENCE(FEET) =      6.40
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.906
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.562
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.25

********************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  51
--------------------------------------------------------------------------------
```

```
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =     14.60  DOWNSTREAM(FEET) =     13.60
CHANNEL LENGTH THRU SUBAREA(FEET) =   404.00   CHANNEL SLOPE =  0.0025
CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  20.000
MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.955
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .3500
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.72
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.59
AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =  11.50
Tc(MIN.) =   18.41
SUBAREA AREA(ACRES) =     0.85       SUBAREA RUNOFF(CFS) =    0.88
AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
TOTAL AREA(ACRES) =       1.0        PEAK FLOW RATE(CFS) =       1.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   0.65
LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =    498.00 FEET.
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =       1.0  TC(MIN.) =     18.41
PEAK FLOW RATE(CFS)   =      1.01
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS

♀
```

RATIONAL METHOD INPUT DATA - POST-PROJECT CONDITIONS

Subarea	Area (ft^2)	Area (Acres)	Upstream Node	Downstream Node	Upstream Elevation (ft)	Downstream Elevation (ft)	Length (ft)	Natural Cover Area	DG Cover Area	AC Paved Area	C-Value
100	4457.31	0.10	100	101	21.8	20	89	0.10	0.00	0.00	0.35
101	39639.21	0.91	101	102	20	16	456	0.91	0.00	0.00	0.35
102	15900.01	0.37	102	103	16	13.3	105	0.37	0.00	0.00	0.35
103	3488.07	0.08	100	104	21.8	20.5	78	0.08	0.00	0.00	0.35
104	19569.30	0.45	104	105	20.5	18	164	0.35	0.10	0.00	0.44
105	59978.57	1.38	105	103	18	13.3	673	0.86	0.31	0.21	0.52
106	26519.30	0.61	103	110.5	13.3	12.1	195	0.46	0.00	0.15	0.49
107	3568.98	0.08	300	106	24.5	17	93	0.08	0.00	0.00	0.35
108	11122.61	0.26	106	107	17	16	92	0.20	0.00	0.06	0.48
109	72732.59	1.67	107	108	16	15.5	307	1.54	0.06	0.07	0.39
110	46817.03	1.07	108	109	15.5	13.5	406	0.95	0.07	0.05	0.40
111	24430.73	0.56	109	110	13.5	12.4	215	0.46	0.00	0.10	0.45
111pipe	NA	NA	110	110.5	12.4	12.1	58	NA	NA	NA	NA
112	40387.23	0.93	110.5	111	12.1	11.3	153	0.35	0.58	0.00	0.60
113	22731.33	0.52	111	112	11.3	9.3	186	0.52	0.00	0.00	0.35
114	2132.53	0.05	112.5	113	10.25	10	73	0.05	0.00	0.00	0.35
200	3314.67	0.08	200	201	19.1	18	99	0.00	0.08	0.00	0.75
201	28438.32	0.65	201	202	18	16	148	0.00	0.65	0.00	0.75
210	2302.12	0.05	210	211	22.6	21.6	97	0.00	0.00	0.05	0.90
211	13991.06	0.32	211	212	21.6	19	368	0.00	0.05	0.27	0.88
212	79905.39	1.83	212	213	19	17.8	186	0.00	1.40	0.43	0.79
213	160073.49	3.67	213	214	17.8	16	264	0.00	2.39	1.28	0.80
220	1731.88	0.04	220	221	20	19.5	94	0.00	0.04	0.00	0.75
221	20725.29	0.48	221	222	19.5	18	178	0.00	0.31	0.17	0.80
222	87335.27	2.00	222	223	18	16	308	0.00	1.31	0.69	0.80
225	53466.73	1.23	224	225	13.7	12.6	NA	0.69	0.00	0.54	0.59
300	2294.38	0.05	300	301	24.5	15.3	38	0.08	0.00	0.00	0.35
301	22539.75	0.52	301	302	15.3	15	196	0.42	0.00	0.07	0.43
302	38541.54	0.88	302	303	15	14.6	223	0.82	0.00	0.06	0.39
303	116857.62	2.68	303	304	14.6	13.1	426	2.18	0.00	0.50	0.45

```
****************************************************************************

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                           Analysis prepared by:

                                    NV5
                          15070 Avenue of Science
                                 Suite 100
                            San Diego, CA 92128

 ************************** DESCRIPTION OF STUDY **************************
* BAY BOULEVARD SUBSTATION                                                 *
* ONSITE HYDROLOGY: POST-PROJECT CONDITIONS                                *
* 100-YEAR STORM EVENT                                                     *
 **************************************************************************

  FILE NAME: POST100.DAT
  TIME/DATE OF STUDY: 16:13 12/05/2013
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.600
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    89.00
  UPSTREAM ELEVATION(FEET) =     21.80
  DOWNSTREAM ELEVATION(FEET) =     20.00
  ELEVATION DIFFERENCE(FEET) =      1.80
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.562
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    80.22
```

```
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.509
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     20.00  DOWNSTREAM(FEET) =     16.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   456.00   CHANNEL SLOPE =  0.0088
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.613
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.60
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =  12.72
  Tc(MIN.) =   22.28
  SUBAREA AREA(ACRES) =     0.91       SUBAREA RUNOFF(CFS) =    0.83
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       0.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   0.69
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     545.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     16.00  DOWNSTREAM(FEET) =     13.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   105.00   CHANNEL SLOPE =  0.0257
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.483
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.95
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   1.83
  Tc(MIN.) =   24.12
  SUBAREA AREA(ACRES) =     0.37       SUBAREA RUNOFF(CFS) =    0.32
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       1.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   0.87
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    100.00 TO NODE    104.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    78.00
  UPSTREAM ELEVATION(FEET) =     21.80
  DOWNSTREAM ELEVATION(FEET) =     20.50
  ELEVATION DIFFERENCE(FEET) =      1.30
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.861
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.420
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     20.50  DOWNSTREAM(FEET) =     18.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   164.00   CHANNEL SLOPE =  0.0152
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =  30.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.687
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4400
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.85
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   13.06
  SUBAREA AREA(ACRES) =     0.45       SUBAREA RUNOFF(CFS) =    0.73
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.426
  TOTAL AREA(ACRES) =        0.5        PEAK FLOW RATE(CFS) =       0.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.04
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     242.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     18.00  DOWNSTREAM(FEET) =     13.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   673.00   CHANNEL SLOPE =  0.0070
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.807
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5200
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.63
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   6.87
  Tc(MIN.) =   19.93
  SUBAREA AREA(ACRES) =     1.38       SUBAREA RUNOFF(CFS) =    2.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.494
```

```
  TOTAL AREA(ACRES) =        1.9         PEAK FLOW RATE(CFS) =       2.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   1.87
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     915.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        2.65    19.93       2.807        1.91
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     915.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        1.20    24.12       2.483        1.38
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     650.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1        3.64      19.93         2.807
     2        3.54      24.12         2.483

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.64   Tc(MIN.) =   19.93
  TOTAL AREA(ACRES) =        3.3

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    110.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     13.30  DOWNSTREAM(FEET) =     12.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   195.00   CHANNEL SLOPE =  0.0062
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.675
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.09
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   1.56
  Tc(MIN.) =   21.49
  SUBAREA AREA(ACRES) =     0.61       SUBAREA RUNOFF(CFS) =    0.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.442
  TOTAL AREA(ACRES) =        3.9         PEAK FLOW RATE(CFS) =       4.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   2.18
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.50 =    1110.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.50 TO NODE    110.50 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
```

```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    106.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    93.00
  UPSTREAM ELEVATION(FEET) =     24.50
  DOWNSTREAM ELEVATION(FEET) =     17.00
  ELEVATION DIFFERENCE(FEET) =      7.50
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.493
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.788
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     17.00  DOWNSTREAM(FEET) =     16.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    92.00   CHANNEL SLOPE =  0.0109
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.600
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4800
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.55
  AVERAGE FLOW DEPTH(FEET) =   0.02   TRAVEL TIME(MIN.) =   2.78
  Tc(MIN.) =    9.27
  SUBAREA AREA(ACRES) =     0.26       SUBAREA RUNOFF(CFS) =    0.57
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.449
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   0.63
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    107.00 =     185.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     16.00  DOWNSTREAM(FEET) =     15.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   307.00   CHANNEL SLOPE =  0.0016
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.023
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.60
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   8.50
  Tc(MIN.) =   17.77
  SUBAREA AREA(ACRES) =     1.67       SUBAREA RUNOFF(CFS) =    1.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.400
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       2.43
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   0.68
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    108.00 =    492.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     15.50  DOWNSTREAM(FEET) =     13.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   406.00   CHANNEL SLOPE =  0.0049
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.660
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.73
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   3.90
  Tc(MIN.) =   21.67
  SUBAREA AREA(ACRES) =     1.07       SUBAREA RUNOFF(CFS) =    1.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.400
  TOTAL AREA(ACRES) =        3.1         PEAK FLOW RATE(CFS) =      3.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   1.80
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    109.00 =    898.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     13.50  DOWNSTREAM(FEET) =     12.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   215.00   CHANNEL SLOPE =  0.0051
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.519
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.87
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   1.92
  Tc(MIN.) =   23.59
  SUBAREA AREA(ACRES) =     0.56       SUBAREA RUNOFF(CFS) =    0.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.408
  TOTAL AREA(ACRES) =        3.6         PEAK FLOW RATE(CFS) =      3.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   1.90
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    110.00 =   1113.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.50 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    12.40  DOWNSTREAM(FEET) =    12.10
  FLOW LENGTH(FEET) =    58.00   MANNING'S N =  0.015
```

```
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.72
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        3.74
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   23.85
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    110.50 =    1171.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.50 TO NODE    110.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1         3.74    23.85       2.501        3.64
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    110.50 =    1171.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1         4.62    21.49       2.675        3.90
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.50 =    1110.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1        7.98      21.49        2.675
     2        8.05      23.85        2.501

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.05   Tc(MIN.) =   23.85
  TOTAL AREA(ACRES) =        7.5

****************************************************************************
  FLOW PROCESS FROM NODE    110.50 TO NODE    111.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     12.10  DOWNSTREAM(FEET) =     11.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   153.00   CHANNEL SLOPE =  0.0052
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.435
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.55
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   1.00
  Tc(MIN.) =   24.85
  SUBAREA AREA(ACRES) =     0.93       SUBAREA RUNOFF(CFS) =    1.36
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.445
  TOTAL AREA(ACRES) =        8.5         PEAK FLOW RATE(CFS) =       9.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   2.59
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    111.00 =    1324.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     11.30  DOWNSTREAM(FEET) =      9.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   186.00   CHANNEL SLOPE =  0.0108
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.290
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.25
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.48
  Tc(MIN.) =   27.33
  SUBAREA AREA(ACRES) =     0.52       SUBAREA RUNOFF(CFS) =    0.42
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.439
  TOTAL AREA(ACRES) =        9.0         PEAK FLOW RATE(CFS) =       9.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOW VELOCITY(FEET/SEC.) =   1.22
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    112.00 =   1510.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        9.0  TC(MIN.) =     27.33
  PEAK FLOW RATE(CFS)   =       9.18
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

♀
```

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BASIN 100

N DATE 12/6/2013
DROGRAPH FILE NAME Text1
IE OF CONCENTRATION 27 MIN.
OUR RAINFALL 2.6 INCHES
SIN AREA 9.03 ACRES
NOFF COEFFICIENT 0.44
AK DISCHARGE 9.18 CFS

IE (MIN) = 0	DISCHARGE (CFS) = 0
IE (MIN) = 27	DISCHARGE (CFS) = 0
IE (MIN) = 54	DISCHARGE (CFS) = 0.7
IE (MIN) = 81	DISCHARGE (CFS) = 0.7
IE (MIN) = 108	DISCHARGE (CFS) = 0.8
IE (MIN) = 135	DISCHARGE (CFS) = 0.9
IE (MIN) = 162	DISCHARGE (CFS) = 1.1
IE (MIN) = 189	DISCHARGE (CFS) = 1.2
IE (MIN) = 216	DISCHARGE (CFS) = 1.8
IE (MIN) = 243	DISCHARGE (CFS) = 2.6
IE (MIN) = 270	DISCHARGE (CFS) = 9.18
IE (MIN) = 297	DISCHARGE (CFS) = 1.5
IE (MIN) = 324	DISCHARGE (CFS) = 1
IE (MIN) = 351	DISCHARGE (CFS) = 0.8
IE (MIN) = 378	DISCHARGE (CFS) = 0

Subsection: Elevation-Area Volume Curve | Return Event: 100 years
Label: Wetland Area | Storm Event:

Elevation (ft)	Planimeter (ft²)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
9.25	0.0	0.000	0.000	0.000	0.000
10.00	0.0	0.062	0.062	0.016	0.016
11.00	0.0	0.253	0.440	0.147	0.162
12.00	0.0	0.355	0.907	0.302	0.465

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Node 112 100-year, 6-hour	Watershed - 100	0	0.829	4.500	9.18

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Out 10	Watershed - 100	0	0.793	4.610	7.38

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Wetland Area (IN)	Watershed - 100	0	0.829	4.500	9.18	(N/A)	(N/A)
Wetland Area (OUT)	Watershed - 100	0	0.793	4.610	7.38	10.95	0.150

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2013 Advanced Engineering Software (aes)
              Ver. 20.0 Release Date: 06/01/2013  License ID 1504

                          Analysis prepared by:

                                   NV5
                         15070 Avenue of Science
                                Suite 100
                           San Diego, CA 92128

 ************************** DESCRIPTION OF STUDY **************************
* BAY BOULEVARD SUBSTATION                                                 *
* ONSITE HYDROLOGY: POST-PROJECT CONDITIONS                                *
* 100=YEAR STORM EVENT                                                     *
 **************************************************************************

  FILE NAME: POST200.DAT
  TIME/DATE OF STUDY: 16:16 12/05/2013
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.600
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .7500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    99.00
  UPSTREAM ELEVATION(FEET) =     19.10
  DOWNSTREAM ELEVATION(FEET) =     18.00
  ELEVATION DIFFERENCE(FEET) =      1.10
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.777
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    61.67
```

```
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.850
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.41
 TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     18.00  DOWNSTREAM(FEET) =     16.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   148.00   CHANNEL SLOPE =  0.0135
 CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  60.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.881
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .7500
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.84
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.58
 AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   1.56
 Tc(MIN.) =    6.33
 SUBAREA AREA(ACRES) =     0.65       SUBAREA RUNOFF(CFS) =    2.87
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.750
 TOTAL AREA(ACRES) =        0.7         PEAK FLOW RATE(CFS) =       3.22

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   1.80
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     247.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .9000
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.00
 UPSTREAM ELEVATION(FEET) =     22.60
 DOWNSTREAM ELEVATION(FEET) =     21.60
 ELEVATION DIFFERENCE(FEET) =      1.00
 URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.767
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    60.31
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.850
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.31
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
 FLOW PROCESS FROM NODE    211.00 TO NODE    212.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     21.60  DOWNSTREAM(FEET) =     19.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   368.00   CHANNEL SLOPE =  0.0071
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   9.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.250
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8800
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.05
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =    5.76
  SUBAREA AREA(ACRES) =     0.32       SUBAREA RUNOFF(CFS) =    1.76
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.883
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       2.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   2.39
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    212.00 =     465.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    213.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     19.00  DOWNSTREAM(FEET) =     17.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   186.00   CHANNEL SLOPE =  0.0065
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   9.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.620
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .7900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.00
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.03
  Tc(MIN.) =    6.80
  SUBAREA AREA(ACRES) =     1.83       SUBAREA RUNOFF(CFS) =    8.13
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.806
  TOTAL AREA(ACRES) =        2.2         PEAK FLOW RATE(CFS) =       9.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) =   3.41
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    213.00 =     651.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    214.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     17.80  DOWNSTREAM(FEET) =     16.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   264.00   CHANNEL SLOPE =  0.0068
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   9.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.101
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.99
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   1.10
  Tc(MIN.) =    7.90
```

```
  SUBAREA AREA(ACRES) =     3.67       SUBAREA RUNOFF(CFS) =   14.98
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.802
  TOTAL AREA(ACRES) =        5.9         PEAK FLOW RATE(CFS) =      24.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   4.35
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    214.00 =     915.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .7500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    94.00
  UPSTREAM ELEVATION(FEET) =     20.00
  DOWNSTREAM ELEVATION(FEET) =     19.50
  ELEVATION DIFFERENCE(FEET) =      0.50
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.533
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.64
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.417
  SUBAREA RUNOFF(CFS) =      0.19
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.19

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    222.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     19.50  DOWNSTREAM(FEET) =     18.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   178.00   CHANNEL SLOPE =  0.0084
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   9.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.599
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.28
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   1.30
  Tc(MIN.) =    6.84
  SUBAREA AREA(ACRES) =     0.48       SUBAREA RUNOFF(CFS) =    2.15
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.796
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       2.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   2.58
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    222.00 =     272.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    223.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     18.00  DOWNSTREAM(FEET) =     16.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   308.00   CHANNEL SLOPE =  0.0065
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   9.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.858
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.05
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.68
  Tc(MIN.) =    8.52
  SUBAREA AREA(ACRES) =     2.00       SUBAREA RUNOFF(CFS) =    7.77
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.799
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       9.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   3.45
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    223.00 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    223.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
==============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    224.00 TO NODE    225.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.858
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5900
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7306
  SUBAREA AREA(ACRES) =    1.23   SUBAREA RUNOFF(CFS) =    3.53
  TOTAL AREA(ACRES) =        3.8   TOTAL RUNOFF(CFS) =      13.31
  TC(MIN.) =    8.52

****************************************************************************
  FLOW PROCESS FROM NODE    225.00 TO NODE    225.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        13.31     8.52       4.858        3.75
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    225.00 =     580.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1         3.22     6.33       5.881        0.73
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    225.00 =     247.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      13.11       6.33         5.881
     2      15.97       8.52         4.858
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.97   Tc(MIN.) =    8.52
  TOTAL AREA(ACRES) =        4.5

****************************************************************************
  FLOW PROCESS FROM NODE    225.00 TO NODE    225.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       15.97     8.52       4.858         4.48
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    225.00 =     580.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       24.02     7.90       5.101         5.87
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    225.00 =     915.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      38.82       7.90        5.101
     2      38.84       8.52        4.858

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      38.84   Tc(MIN.) =    8.52
  TOTAL AREA(ACRES) =       10.4
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       10.4  TC(MIN.) =      8.52
  PEAK FLOW RATE(CFS)    =      38.84
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

♀
```

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****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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                           Analysis prepared by:

                                    NV5
                          15070 Avenue of Science
                                 Suite 100
                            San Diego, CA 92128

 ************************** DESCRIPTION OF STUDY **************************
* BAY BOULEVARD SUBSTATION                                                 *
* ONSITE HYDROLOGY: POST-PROJECT CONDITIONS - NW DISCHARGE                 *
* 100-YEAR STORM EVENT                                                     *
 **************************************************************************

  FILE NAME: POST300.DAT
  TIME/DATE OF STUDY: 09:08 12/06/2013
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.600
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.  (FT)     (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    38.00
  UPSTREAM ELEVATION(FEET) =     24.50
  DOWNSTREAM ELEVATION(FEET) =     15.30
  ELEVATION DIFFERENCE(FEET) =      9.20
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.863
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.850
```

```
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     15.30  DOWNSTREAM(FEET) =     15.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   196.00   CHANNEL SLOPE =  0.0015
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  60.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.642
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4300
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.35
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   9.45
  Tc(MIN.) =   13.32
  SUBAREA AREA(ACRES) =     0.52       SUBAREA RUNOFF(CFS) =    0.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.423
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       0.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   0.40
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     234.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     15.00  DOWNSTREAM(FEET) =     14.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   223.00   CHANNEL SLOPE =  0.0018
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  60.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.730
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.50
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   7.50
  Tc(MIN.) =   20.81
  SUBAREA AREA(ACRES) =     0.88       SUBAREA RUNOFF(CFS) =    0.94
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.403
  TOTAL AREA(ACRES) =        1.5        PEAK FLOW RATE(CFS) =       1.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   0.50
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     457.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     14.60  DOWNSTREAM(FEET) =     13.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   426.00   CHANNEL SLOPE =  0.0035
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
```

```
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.250
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.97
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   7.29
  Tc(MIN.) =   28.10
  SUBAREA AREA(ACRES) =     2.68       SUBAREA RUNOFF(CFS) =    2.71
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.433
  TOTAL AREA(ACRES) =        4.1         PEAK FLOW RATE(CFS) =       4.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   1.11
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    304.00 =    883.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        4.1  TC(MIN.) =    28.10
  PEAK FLOW RATE(CFS)   =       4.03
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

♀
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****************************************************************************

             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
             Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                          2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 20.0 Release Date: 06/01/2013  License ID 1504

                           Analysis prepared by:





 ************************** DESCRIPTION OF STUDY **************************
* BAY BOULEVARD SUBSTATION                                                  *
* ONSITE HYDROLOGY: POST-PROJECT CONDITIONS - SW DISCHARGE                  *
* 100-YEAR STORM EVENT                                                      *
 **************************************************************************

  FILE NAME: POST100A.DAT
  TIME/DATE OF STUDY: 12:10 12/10/2013
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.600
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    225.00 TO NODE    225.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  34.32   RAIN INTENSITY(INCH/HOUR) =  1.98
  TOTAL AREA(ACRES) =    10.36   TOTAL RUNOFF(CFS) =      2.12

****************************************************************************
  FLOW PROCESS FROM NODE    225.10 TO NODE    225.10 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  33.93   RAIN INTENSITY(INCH/HOUR) =  1.99
  TOTAL AREA(ACRES) =     9.03   TOTAL RUNOFF(CFS) =     7.38

****************************************************************************
  FLOW PROCESS FROM NODE    112.50 TO NODE    113.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     10.25  DOWNSTREAM(FEET) =     10.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    73.00   CHANNEL SLOPE =  0.0034
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.025   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.970
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.09
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   0.58
  Tc(MIN.) =   34.51
  SUBAREA AREA(ACRES) =     0.05       SUBAREA RUNOFF(CFS) =    0.03
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.410
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =       7.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   2.09
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE    113.00 =      73.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        7.38    34.51       1.970        9.08
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE    113.00 =      73.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        2.12    34.32       1.978       10.36
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE    113.00 =       0.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       9.46      34.32         1.978
      2       9.49      34.51         1.970

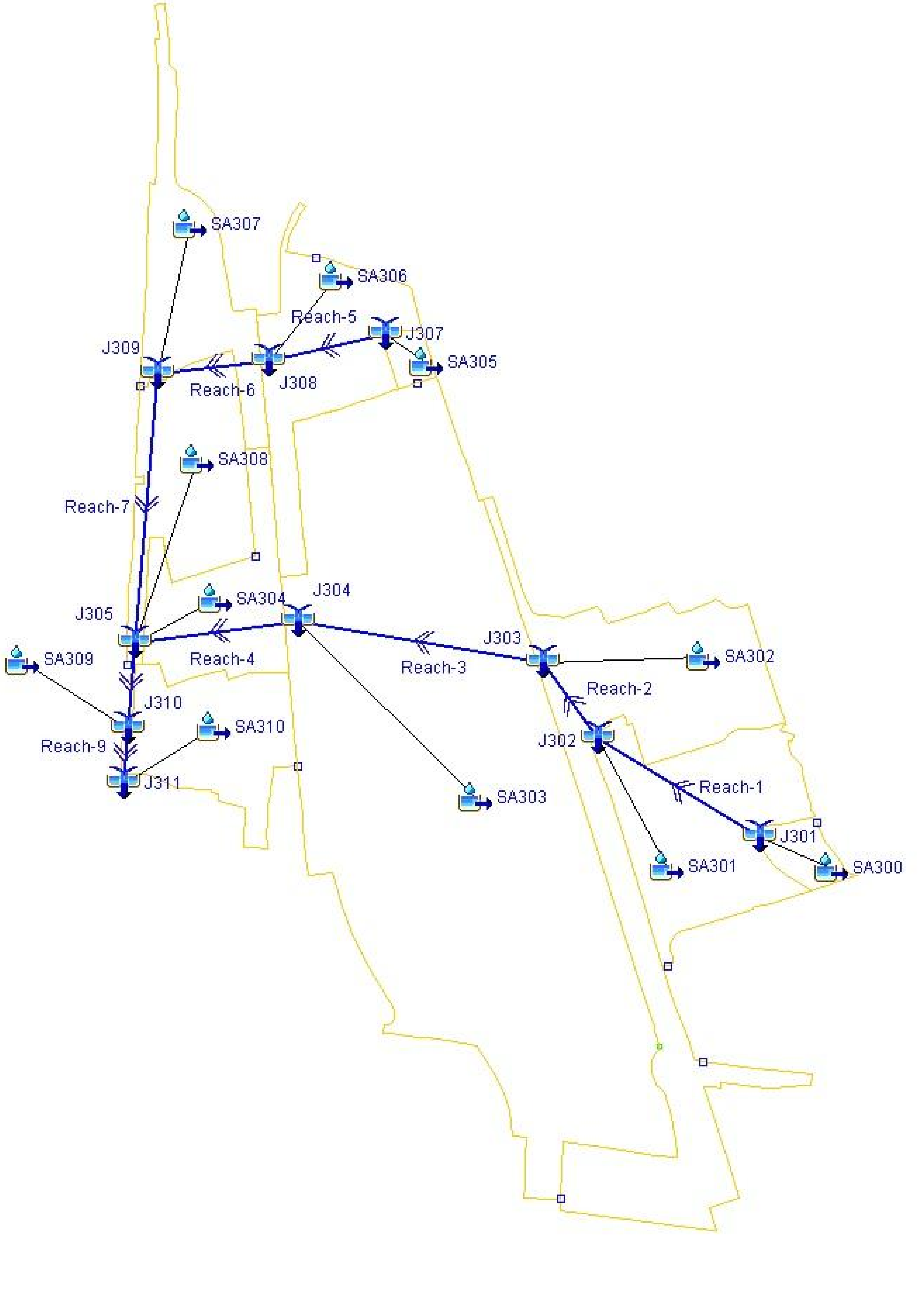
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.49   Tc(MIN.) =   34.51
  TOTAL AREA(ACRES) =      19.4
============================================================================
```

```
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       19.4  TC(MIN.) =     34.51
  PEAK FLOW RATE(CFS)   =       9.49
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

♀
```

APPENDIX B

HEC-HMS Model Schematic



NRCS INPUT DATA - EXISTING CONDITIONS (OFFSITE)

Subarea	Area (ft^2)	Area (Acres)	Area (mi^2)	Upstream Node	Downstream Node	Routing Upstream Elevation (ft)	Routing Downstream Elevation (ft)	Routing Length (ft)	Routing Slope (ft/ft)	Dirt (Acres)	AC Paved Area	Commercial Area	Dense Residential	$CN_{2.0}$	$CN_{2.5}$
300	57500.90	1.32	0.0020626	NA	NA	NA	NA	NA	NA	1.32	0.00	0.00	0.00	89	93
301	443306.38	10.18	0.0159014	301	302	46	38	859	0.00931	2.53	0.00	7.65	0.00	94	96
302	823001.14	18.89	0.0295211	302	303	38	37.9	292	0.00034	6.28	5.19	4.18	3.24	93	96
303	2478448.52	56.90	0.0889021	303	304	37.9	28	997	0.00993	4.64	12.46	4.80	35.00	93	96
NA	NA	NA	NA	304	305	28	15	702	0.01852	NA	NA	NA	NA	NA	NA
304	257480.01	5.91	0.0092358	NA	NA	NA	NA	NA	NA	0.00	2.11	3.80	0.00	96	98
305	31077.82	0.71	0.0011148	NA	NA	NA	NA	NA	NA	0.00	0.00	0.71	0.00	95	97
306	338338.19	7.77	0.0121362	307	308	33	32	502	0.00199	0.00	2.57	5.20	0.00	96	98
307	290938.99	6.68	0.0104360	308	309	32	23	600	0.01500	0.38	3.83	2.47	0.00	96	98
308	336034.60	7.71	0.0120536	309	305	23	15	1057	0.00757	0.80	1.26	5.65	0.00	95	97
309	9891.99	0.23	0.0003548	305	310	15	13.3	273	0.00623	0.23	0.00	0.00	0.00	89	93
310	282403.39	6.48	0.0101298	310	311	13.3	13	148	0.00203	0.14	1.20	5.14	0.00	95	97

HEC-HMS Basin Input

					Overland						Shallow Concentrated						Concentrated: Pipe						Concentrated: Channel/Swale							
Subarea	Area (ft^2)	Area (acres)	Area (mi^2)	L_{Total} (ft)	$Elev_1$ (ft)	$Elev_{Overland}$ (ft)	$L_{Overland}$ (ft)	$Slope_{Overland}$ (%)	"n" value	Sheet Flow (min)	$Elev_{Overland}$ (ft)	$Elev_2$ (ft)	$L_{ShallowConc}$ (ft)	$Slope_{Overland}$ (%)	Paved/Unpaved?	Shallow Conc Flow (min)	Pipe $Elev_A$ (ft)	Pipe $Elev_B$ (ft)	Pipe $L_{(A-B)}$ (ft)	Pipe Slope (%)	Pipe Velocity (ft/s)	Pipe Flow Time (min)	Swale $Elev_A$ (ft)	Swale $Elev_B$ (ft)	Swale $L_{(A-B)}$ (ft)	Swale Slope (%)	Swale Velocity (ft/s)	Swale Flow Time (min)	Total Time (min)	NRCS lag=Tc*0.6
300	57500.90	1.32	0.00206	431	52.3	50.0	80.0	2.875	0.050	3.9	50.0	46.0	351.0	1.140	Unpaved	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	4.4
301	443306.38	10.18	0.01590	1252	51.0	49.0	80.0	2.500	0.050	4.2	49.0	38.0	1172.0	0.939	Unpaved	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.6	10.0
302	823001.14	18.89	0.02952	2594	59.6	59.0	60.0	1.000	0.020	2.3	59.0	52.0	800.0	0.875	Paved	7.0	52.0	50.0	242.0	0.8	5.8	0.7	50.0	38.0	1491.0	0.8	2.9	8.6	18.6	11.1
303	2478448.52	56.90	0.08890	2707	58.0	57.0	70.0	1.429	0.050	4.7	57.0	50.0	524.0	1.336	Unpaved	4.7	50.0	28.0	2112.0	1.0	7.5	4.7	0.0	0.0	0.0	0.0	0.0	0.0	14.0	8.4
304	257480.01	5.91	0.00924	2712	37.5	36.0	75.0	2.000	0.020	2.1	36.0	34.0	835.0	0.240	Paved	14.0	34.0	15.0	524.0	3.6	7.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	17.3	10.4
305	31077.82	0.71	0.00111	278	36.0	35.5	60.0	0.833	0.020	2.5	35.5	33.0	218.0	1.147	Paved	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	2.5
306	338338.19	7.77	0.01214	576	36.0	35.0	70.0	1.429	0.020	2.2	35.0	32.0	505.0	0.594	Paved	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	4.6
307	290938.99	6.68	0.01044	1455	52.0	51.0	75.0	1.333	0.020	2.4	51.0	30.0	652.0	3.221	Paved	3.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	23.0	725.0	1.0	1.8	6.7	12.1	7.3
308	336034.60	7.71	0.01205	1416	35.0	30.0	35.0	14.286	0.050	1.1	30.0	20.0	903.0	1.107	Paved	7.0	0.0	0.0	0.0	0.0	0.00	0.0	20.0	15.0	478.0	1.0	3.5	2.3	10.4	6.2
309	9891.99	0.23	0.00035	273	21.0	15.0	15.0	40.000	0.050	0.4	NA	0.0	0.0	#VALUE!	Unpaved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	13.3	258.0	0.7	1.1	3.9	4.3	2.6
310	282403.39	6.48	0.01013	1094	36.0	34.5	70.0	2.143	0.02	1.9	34.5	13.0	1060.0	2.028	Paved	6.1	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	4.8

Bay BLVD 100-Yr 24-hour rainfall dist

```
KM NESTED STORM PER COUNTY OF SAN DIEGO HYDROLOGY MANUAL
KM COPYRIGHT 2003 RICK ENGINEERING COMPANY
KM THE FOLLOWING IT CARD MUST BE USED IN YOUR DATA SET
KM IT 5 01JAN90 1200 300
KM 6HR RAINFALL IS  2.6  INCHES
KM 24HR RAINFALL IS  4.5  INCHES
KM DAR30 =  .9977751
KM DAR60 =  .9988492
KM DAR180 =  .9992328
KM DAR360 =  .9994246
KM DAR1440 =  .9996164
KM BASIN AREA IS  .1918  SQUARE MILES
IN 5 01JAN90 1200 300
PI .00618  .0062  .00622  .00625  .00626  .00629  .0063  .00633  .00634  .00637
PI .00638  .00641  .00643  .00646  .00647  .0065  .00652  .00655  .00656  .00659
PI .00661  .00664  .00665  .00669  .0067  .00673  .00675  .00678  .0068  .00684
PI .00685  .00689  .0069  .00694  .00696  .00699  .00701  .00705  .00707  .0071
PI .00712  .00716  .00718  .00722  .00724  .00728  .0073  .00734  .00736  .0074
PI .00743  .00747  .00749  .00753  .00756  .0076  .00762  .00767  .00769  .00774
PI .00776  .00781  .00784  .00789  .00791  .00796  .00799  .00804  .00807  .00812
PI .00815  .0082  .00823  .00829  .00831  .00837  .0084  .00846  .00849  .00855
PI .00858  .00865  .00868  .00874  .00878  .00884  .00888  .00895  .00898  .00905
PI .00909  .00916  .0092  .00928  .00931  .00939  .00943  .00951  .00955  .00964
PI .00968  .00977  .00981  .0099  .00995  .01004  .01009  .01019  .01024  .01034
PI .01039  .01049  .01055  .01066  .01071  .01083  .01088  .011  .01106  .01119
PI .01125  .01138  .01145  .01158  .01165  .0118  .01187  .01202  .0121  .01225
PI .01233  .0125  .01259  .01276  .01285  .01304  .01313  .01333  .01343  .01364
PI .01375  .01397  .01408  .01291  .01303  .01327  .0134  .01366  .0138  .01408
PI .01423  .01453  .01469  .01502  .0152  .01556  .01575  .01615  .01636  .0168
PI .01703  .01752  .01778  .01833  .01862  .01923  .01956  .02029  .02066  .02147
PI .02191  .02285  .02337  .02449  .0251  .02645  .02721  .02889  .02983  .03198
PI .03322  .03611  .03781  .04214  .04466  .05113  .0554  .06744  .07681  .11278
PI .15891  .56959  .09046  .06073  .04761  .03973  .03459  .03086  .02801  .02575
PI .02391  .02237  .02106  .01991  .01892  .01805  .01727  .01658  .01595  .01538
PI .01485  .01438  .01394  .01353  .01315  .0142  .01386  .01353  .01323  .01294
PI .01267  .01242  .01217  .01194  .01172  .01151  .01132  .01113  .01094  .01077
PI .0106  .01044  .01029  .01014  .00999  .00986  .00972  .0096  .00947  .00935
PI .00924  .00912  .00902  .00891  .00881  .00871  .00861  .00852  .00843  .00834
PI .00826  .00817  .00809  .00801  .00794  .00786  .00779  .00772  .00765  .00758
PI .00751  .00745  .00738  .00732  .00726  .0072  .00714  .00709  .00703  .00698
PI .00692  .00687  .00682  .00677  .00672  .00667  .00662  .00658  .00653  .00648
PI .00644  .0064  .00635  .00631  .00627  .00623  .00619  0  0  0
PI 0  0  0  0  0  0  0  0  0  0
PI 0  0
```

Ordinate	Date/Time	100-Year Discharge (cfs)	
		J310	J311
1	31 Dec 09, 24:00	0	0
2	01 Jan 10, 00:05	0	0
3	01 Jan 10, 00:10	0	0
4	01 Jan 10, 00:15	0	0
5	01 Jan 10, 00:20	0	0
6	01 Jan 10, 00:25	0.01	0.01
7	01 Jan 10, 00:30	0.05	0.05
8	01 Jan 10, 00:35	0.15	0.14
9	01 Jan 10, 00:40	0.31	0.32
10	01 Jan 10, 00:45	0.49	0.52
11	01 Jan 10, 00:50	0.73	0.78
12	01 Jan 10, 00:55	1.09	1.13
13	01 Jan 10, 01:00	1.54	1.57
14	01 Jan 10, 01:05	2.04	2.08
15	01 Jan 10, 01:10	2.56	2.63
16	01 Jan 10, 01:15	3.07	3.18
17	01 Jan 10, 01:20	3.55	3.7
18	01 Jan 10, 01:25	4.02	4.2
19	01 Jan 10, 01:30	4.45	4.67
20	01 Jan 10, 01:35	4.86	5.11
21	01 Jan 10, 01:40	5.24	5.52
22	01 Jan 10, 01:45	5.6	5.9
23	01 Jan 10, 01:50	5.94	6.27
24	01 Jan 10, 01:55	6.25	6.61
25	01 Jan 10, 02:00	6.55	6.93
26	01 Jan 10, 02:05	6.84	7.23
27	01 Jan 10, 02:10	7.1	7.51
28	01 Jan 10, 02:15	7.36	7.78
29	01 Jan 10, 02:20	7.6	8.04
30	01 Jan 10, 02:25	7.82	8.28
31	01 Jan 10, 02:30	8.04	8.5
32	01 Jan 10, 02:35	8.24	8.72
33	01 Jan 10, 02:40	8.43	8.93
34	01 Jan 10, 02:45	8.62	9.12
35	01 Jan 10, 02:50	8.79	9.31
36	01 Jan 10, 02:55	8.96	9.48
37	01 Jan 10, 03:00	9.11	9.65
38	01 Jan 10, 03:05	9.27	9.81
39	01 Jan 10, 03:10	9.41	9.96
40	01 Jan 10, 03:15	9.55	10.11
41	01 Jan 10, 03:20	9.68	10.25
42	01 Jan 10, 03:25	9.81	10.38
43	01 Jan 10, 03:30	9.93	10.51
44	01 Jan 10, 03:35	10.04	10.63
45	01 Jan 10, 03:40	10.15	10.75
46	01 Jan 10, 03:45	10.26	10.86
47	01 Jan 10, 03:50	10.36	10.96
48	01 Jan 10, 03:55	10.46	11.07
49	01 Jan 10, 04:00	10.55	11.17
50	01 Jan 10, 04:05	10.64	11.26
51	01 Jan 10, 04:10	10.73	11.35
52	01 Jan 10, 04:15	10.81	11.44
53	01 Jan 10, 04:20	10.89	11.53

Ordinate	Date/Time	100-Year Discharge (cfs)	
		J310	J311
54	01 Jan 10, 04:25	10.97	11.61
55	01 Jan 10, 04:30	11.04	11.69
56	01 Jan 10, 04:35	11.12	11.76
57	01 Jan 10, 04:40	11.19	11.84
58	01 Jan 10, 04:45	11.25	11.91
59	01 Jan 10, 04:50	11.32	11.97
60	01 Jan 10, 04:55	11.38	12.04
61	01 Jan 10, 05:00	11.44	12.1
62	01 Jan 10, 05:05	11.5	12.16
63	01 Jan 10, 05:10	11.55	12.22
64	01 Jan 10, 05:15	11.61	12.28
65	01 Jan 10, 05:20	11.66	12.34
66	01 Jan 10, 05:25	11.71	12.39
67	01 Jan 10, 05:30	11.76	12.44
68	01 Jan 10, 05:35	11.81	12.49
69	01 Jan 10, 05:40	11.86	12.54
70	01 Jan 10, 05:45	11.9	12.59
71	01 Jan 10, 05:50	11.95	12.63
72	01 Jan 10, 05:55	11.99	12.68
73	01 Jan 10, 06:00	12.03	12.72
74	01 Jan 10, 06:05	12.07	12.76
75	01 Jan 10, 06:10	12.11	12.8
76	01 Jan 10, 06:15	12.14	12.84
77	01 Jan 10, 06:20	12.18	12.88
78	01 Jan 10, 06:25	12.22	12.92
79	01 Jan 10, 06:30	12.25	12.96
80	01 Jan 10, 06:35	12.28	12.99
81	01 Jan 10, 06:40	12.32	13.02
82	01 Jan 10, 06:45	12.35	13.06
83	01 Jan 10, 06:50	12.38	13.09
84	01 Jan 10, 06:55	12.41	13.12
85	01 Jan 10, 07:00	12.44	13.15
86	01 Jan 10, 07:05	12.47	13.18
87	01 Jan 10, 07:10	12.5	13.21
88	01 Jan 10, 07:15	12.52	13.24
89	01 Jan 10, 07:20	12.55	13.27
90	01 Jan 10, 07:25	12.57	13.29
91	01 Jan 10, 07:30	12.6	13.32
92	01 Jan 10, 07:35	12.62	13.35
93	01 Jan 10, 07:40	12.65	13.37
94	01 Jan 10, 07:45	12.67	13.4
95	01 Jan 10, 07:50	12.69	13.42
96	01 Jan 10, 07:55	12.72	13.44
97	01 Jan 10, 08:00	12.74	13.46
98	01 Jan 10, 08:05	12.76	13.49
99	01 Jan 10, 08:10	12.78	13.51
100	01 Jan 10, 08:15	12.8	13.53
101	01 Jan 10, 08:20	12.82	13.55
102	01 Jan 10, 08:25	12.84	13.57
103	01 Jan 10, 08:30	12.86	13.59
104	01 Jan 10, 08:35	12.87	13.61
105	01 Jan 10, 08:40	12.89	13.63
106	01 Jan 10, 08:45	12.91	13.65

Ordinate	Date/Time	100-Year Discharge (cfs)	
		J310	J311
107	01 Jan 10, 08:50	12.93	13.66
108	01 Jan 10, 08:55	12.94	13.68
109	01 Jan 10, 09:00	12.96	13.7
110	01 Jan 10, 09:05	12.98	13.71
111	01 Jan 10, 09:10	12.99	13.73
112	01 Jan 10, 09:15	13.01	13.75
113	01 Jan 10, 09:20	13.02	13.76
114	01 Jan 10, 09:25	13.04	13.78
115	01 Jan 10, 09:30	13.05	13.79
116	01 Jan 10, 09:35	13.07	13.81
117	01 Jan 10, 09:40	13.08	13.82
118	01 Jan 10, 09:45	13.09	13.84
119	01 Jan 10, 09:50	13.11	13.85
120	01 Jan 10, 09:55	13.12	13.86
121	01 Jan 10, 10:00	13.13	13.88
122	01 Jan 10, 10:05	13.14	13.89
123	01 Jan 10, 10:10	13.16	13.9
124	01 Jan 10, 10:15	13.17	13.92
125	01 Jan 10, 10:20	13.18	13.93
126	01 Jan 10, 10:25	13.19	13.94
127	01 Jan 10, 10:30	13.2	13.95
128	01 Jan 10, 10:35	13.21	13.96
129	01 Jan 10, 10:40	13.22	13.97
130	01 Jan 10, 10:45	13.24	13.99
131	01 Jan 10, 10:50	13.25	14
132	01 Jan 10, 10:55	13.26	14.01
133	01 Jan 10, 11:00	13.27	14.02
134	01 Jan 10, 11:05	13.28	14.03
135	01 Jan 10, 11:10	13.29	14.04
136	01 Jan 10, 11:15	13.3	14.05
137	01 Jan 10, 11:20	13.3	14.06
138	01 Jan 10, 11:25	13.31	14.07
139	01 Jan 10, 11:30	13.32	14.08
140	01 Jan 10, 11:35	13.33	14.09
141	01 Jan 10, 11:40	13.34	14.1
142	01 Jan 10, 11:45	13.35	14.1
143	01 Jan 10, 11:50	13.36	14.11
144	01 Jan 10, 11:55	13.37	14.12
145	01 Jan 10, 12:00	13.37	14.13
146	01 Jan 10, 12:05	13.38	14.14
147	01 Jan 10, 12:10	13.39	14.15
148	01 Jan 10, 12:15	13.4	14.15
149	01 Jan 10, 12:20	13.4	14.16
150	01 Jan 10, 12:25	13.41	14.17
151	01 Jan 10, 12:30	13.42	14.18
152	01 Jan 10, 12:35	13.43	14.19
153	01 Jan 10, 12:40	13.43	14.19
154	01 Jan 10, 12:45	13.44	14.2
155	01 Jan 10, 12:50	14.48	15.34
156	01 Jan 10, 12:55	17.59	18.37
157	01 Jan 10, 13:00	21.29	22.05
158	01 Jan 10, 13:05	23.93	24.93
159	01 Jan 10, 13:10	25.42	26.65

Ordinate	Date/Time	100-Year Discharge (cfs)	
		J310	J311
160	01 Jan 10, 13:15	26.19	27.56
161	01 Jan 10, 13:20	26.6	28.04
162	01 Jan 10, 13:25	26.82	28.3
163	01 Jan 10, 13:30	26.95	28.45
164	01 Jan 10, 13:35	27.03	28.54
165	01 Jan 10, 13:40	27.07	28.6
166	01 Jan 10, 13:45	27.11	28.63
167	01 Jan 10, 13:50	27.14	28.66
168	01 Jan 10, 13:55	27.16	28.69
169	01 Jan 10, 14:00	27.18	28.71
170	01 Jan 10, 14:05	27.2	28.73
171	01 Jan 10, 14:10	27.22	28.75
172	01 Jan 10, 14:15	27.24	28.77
173	01 Jan 10, 14:20	27.25	28.79
174	01 Jan 10, 14:25	27.27	28.8
175	01 Jan 10, 14:30	27.29	28.84
176	01 Jan 10, 14:35	28.37	30.07
177	01 Jan 10, 14:40	31.58	33.22
178	01 Jan 10, 14:45	35.37	36.99
179	01 Jan 10, 14:50	38.05	39.88
180	01 Jan 10, 14:55	39.53	41.58
181	01 Jan 10, 15:00	40.3	42.48
182	01 Jan 10, 15:05	40.7	42.95
183	01 Jan 10, 15:10	42.02	44.46
184	01 Jan 10, 15:15	45.41	47.85
185	01 Jan 10, 15:20	49.29	51.72
186	01 Jan 10, 15:25	52	54.65
187	01 Jan 10, 15:30	54.62	57.67
188	01 Jan 10, 15:35	59.86	63.2
189	01 Jan 10, 15:40	68.55	72.14
190	01 Jan 10, 15:45	79.8	83.83
191	01 Jan 10, 15:50	94.86	99.86
192	01 Jan 10, 15:55	120.76	127.85
193	01 Jan 10, 16:00	208.36	223.98
194	01 Jan 10, 16:05	326.33	335.25
195	01 Jan 10, 16:10	321.75	330.5
196	01 Jan 10, 16:15	237.18	251.5
197	01 Jan 10, 16:20	161.8	174.83
198	01 Jan 10, 16:25	112.28	121.81
199	01 Jan 10, 16:30	81.32	88.15
200	01 Jan 10, 16:35	62.84	67.94
201	01 Jan 10, 16:40	52.67	56.62
202	01 Jan 10, 16:45	46.26	49.31
203	01 Jan 10, 16:50	40.16	42.85
204	01 Jan 10, 16:55	35.01	37.49
205	01 Jan 10, 17:00	31.66	33.83
206	01 Jan 10, 17:05	29.81	31.71
207	01 Jan 10, 17:10	28.87	30.61
208	01 Jan 10, 17:15	28.41	30.06
209	01 Jan 10, 17:20	28.18	29.78
210	01 Jan 10, 17:25	28.06	29.64
211	01 Jan 10, 17:30	27.98	29.54
212	01 Jan 10, 17:35	26.87	28.27

Ordinate	Date/Time	100-Year Discharge (cfs)	
		J310	J311
213	01 Jan 10, 17:40	23.62	25.11
214	01 Jan 10, 17:45	19.81	21.36
215	01 Jan 10, 17:50	17.11	18.45
216	01 Jan 10, 17:55	15.59	16.69
217	01 Jan 10, 18:00	14.8	15.75
218	01 Jan 10, 18:05	14.4	15.27
219	01 Jan 10, 18:10	14.19	15.01
220	01 Jan 10, 18:15	14.08	14.88
221	01 Jan 10, 18:20	14.02	14.81
222	01 Jan 10, 18:25	13.99	14.78
223	01 Jan 10, 18:30	13.98	14.76
224	01 Jan 10, 18:35	13.97	14.75
225	01 Jan 10, 18:40	13.97	14.75
226	01 Jan 10, 18:45	13.97	14.75
227	01 Jan 10, 18:50	13.97	14.75
228	01 Jan 10, 18:55	13.97	14.75
229	01 Jan 10, 19:00	13.97	14.75
230	01 Jan 10, 19:05	13.97	14.75
231	01 Jan 10, 19:10	13.97	14.75
232	01 Jan 10, 19:15	13.97	14.75
233	01 Jan 10, 19:20	13.97	14.75
234	01 Jan 10, 19:25	13.97	14.75
235	01 Jan 10, 19:30	13.97	14.75
236	01 Jan 10, 19:35	13.97	14.75
237	01 Jan 10, 19:40	13.97	14.75
238	01 Jan 10, 19:45	13.97	14.75
239	01 Jan 10, 19:50	13.97	14.75
240	01 Jan 10, 19:55	13.97	14.75
241	01 Jan 10, 20:00	13.97	14.75
242	01 Jan 10, 20:05	13.97	14.75
243	01 Jan 10, 20:10	13.97	14.75
244	01 Jan 10, 20:15	13.97	14.75
245	01 Jan 10, 20:20	13.97	14.75
246	01 Jan 10, 20:25	13.97	14.75
247	01 Jan 10, 20:30	13.97	14.75
248	01 Jan 10, 20:35	13.97	14.75
249	01 Jan 10, 20:40	13.97	14.76
250	01 Jan 10, 20:45	13.97	14.76
251	01 Jan 10, 20:50	13.98	14.76
252	01 Jan 10, 20:55	13.98	14.76
253	01 Jan 10, 21:00	13.98	14.76
254	01 Jan 10, 21:05	13.98	14.76
255	01 Jan 10, 21:10	13.98	14.76
256	01 Jan 10, 21:15	13.98	14.76
257	01 Jan 10, 21:20	13.98	14.76
258	01 Jan 10, 21:25	13.98	14.76
259	01 Jan 10, 21:30	13.98	14.76
260	01 Jan 10, 21:35	13.98	14.76
261	01 Jan 10, 21:40	13.98	14.76
262	01 Jan 10, 21:45	13.98	14.76
263	01 Jan 10, 21:50	13.98	14.76
264	01 Jan 10, 21:55	13.98	14.76
265	01 Jan 10, 22:00	13.98	14.76

Ordinate	Date/Time	100-Year Discharge (cfs)	
		J310	J311
266	01 Jan 10, 22:05	13.98	14.76
267	01 Jan 10, 22:10	13.98	14.76
268	01 Jan 10, 22:15	13.98	14.76
269	01 Jan 10, 22:20	13.98	14.76
270	01 Jan 10, 22:25	13.98	14.76
271	01 Jan 10, 22:30	13.98	14.76
272	01 Jan 10, 22:35	13.98	14.76
273	01 Jan 10, 22:40	13.98	14.76
274	01 Jan 10, 22:45	13.98	14.77
275	01 Jan 10, 22:50	13.98	14.77
276	01 Jan 10, 22:55	13.98	14.77
277	01 Jan 10, 23:00	13.99	14.77
278	01 Jan 10, 23:05	13.99	14.77
279	01 Jan 10, 23:10	13.99	14.77
280	01 Jan 10, 23:15	13.99	14.77
281	01 Jan 10, 23:20	13.99	14.77
282	01 Jan 10, 23:25	13.99	14.77
283	01 Jan 10, 23:30	13.99	14.77
284	01 Jan 10, 23:35	13.99	14.77
285	01 Jan 10, 23:40	13.99	14.77
286	01 Jan 10, 23:45	13.99	14.77
287	01 Jan 10, 23:50	13.99	14.77
288	01 Jan 10, 23:55	13.99	14.76
289	01 Jan 10, 24:00	12.91	13.59
290	02 Jan 10, 00:05	9.71	10.56

APPENDIX C

PYRIGHT 1992, 2001 RICK ENGINEERING COMPANY BASIN 200

N DATE 12/6/2013
DROGRAPH FILE NAME Text1
IE OF CONCENTRATION 9 MIN.
OUR RAINFALL 2.6 INCHES
SIN AREA 10.36 ACRES
NOFF COEFFICIENT 0.77
AK DISCHARGE 38.84 CFS

IE (MIN) = 0	DISCHARGE (CFS) = 0
IE (MIN) = 9	DISCHARGE (CFS) = 0
IE (MIN) = 18	DISCHARGE (CFS) = 1.3
IE (MIN) = 27	DISCHARGE (CFS) = 1.3
IE (MIN) = 36	DISCHARGE (CFS) = 1.3
IE (MIN) = 45	DISCHARGE (CFS) = 1.4
IE (MIN) = 54	DISCHARGE (CFS) = 1.4
IE (MIN) = 63	DISCHARGE (CFS) = 1.4
IE (MIN) = 72	DISCHARGE (CFS) = 1.5
IE (MIN) = 81	DISCHARGE (CFS) = 1.5
IE (MIN) = 90	DISCHARGE (CFS) = 1.6
IE (MIN) = 99	DISCHARGE (CFS) = 1.6
IE (MIN) = 108	DISCHARGE (CFS) = 1.7
IE (MIN) = 117	DISCHARGE (CFS) = 1.8
IE (MIN) = 126	DISCHARGE (CFS) = 1.9
IE (MIN) = 135	DISCHARGE (CFS) = 2
IE (MIN) = 144	DISCHARGE (CFS) = 2.1
IE (MIN) = 153	DISCHARGE (CFS) = 2.2
IE (MIN) = 162	DISCHARGE (CFS) = 2.4
IE (MIN) = 171	DISCHARGE (CFS) = 2.5
IE (MIN) = 180	DISCHARGE (CFS) = 2.7
IE (MIN) = 189	DISCHARGE (CFS) = 2.9
IE (MIN) = 198	DISCHARGE (CFS) = 3.3
IE (MIN) = 207	DISCHARGE (CFS) = 3.6
IE (MIN) = 216	DISCHARGE (CFS) = 4.4
IE (MIN) = 225	DISCHARGE (CFS) = 5
IE (MIN) = 234	DISCHARGE (CFS) = 7.4
IE (MIN) = 243	DISCHARGE (CFS) = 9
IE (MIN) = 252	DISCHARGE (CFS) = 38.84
IE (MIN) = 261	DISCHARGE (CFS) = 5.9
IE (MIN) = 270	DISCHARGE (CFS) = 4
IE (MIN) = 279	DISCHARGE (CFS) = 3.1
IE (MIN) = 288	DISCHARGE (CFS) = 2.6
IE (MIN) = 297	DISCHARGE (CFS) = 2.3
IE (MIN) = 306	DISCHARGE (CFS) = 2
IE (MIN) = 315	DISCHARGE (CFS) = 1.8
IE (MIN) = 324	DISCHARGE (CFS) = 1.7
IE (MIN) = 333	DISCHARGE (CFS) = 1.6
IE (MIN) = 342	DISCHARGE (CFS) = 1.5
IE (MIN) = 351	DISCHARGE (CFS) = 1.4
IE (MIN) = 360	DISCHARGE (CFS) = 1.3
IE (MIN) = 369	DISCHARGE (CFS) = 0

Subsection: Elevation-Area Volume Curve — Return Event: 100 years
Label: Node 225 — Storm Event:

Elevation (ft)	Planimeter (ft²)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
13.00	0.0	0.304	0.000	0.000	0.000
14.00	0.0	0.765	1.552	0.517	0.517
15.00	0.0	0.846	2.415	0.805	1.322
16.00	0.0	0.927	2.659	0.886	2.208

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
100-year, 6-hour	Watershed - 100	0	1.701	4.200	38.84

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Out 10	Watershed - 100	0	0.371	4.630	2.12

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Node 225 (IN)	Watershed - 100	0	1.701	4.200	38.84	(N/A)	(N/A)
Node 225 (OUT)	Watershed - 100	0	0.371	4.630	2.12	14.62	1.008

Subsection: Time vs. Elevation | Return Event: 100 years
Label: Node 225 (IN) | Storm Event:

Time vs. Elevation (ft)

Output Time increment = 0.010 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	13.00	13.00	13.00	13.00	13.00
0.050	13.00	13.00	13.00	13.00	13.00
0.100	13.00	13.00	13.00	13.00	13.00
0.150	13.00	13.00	13.00	13.00	13.00
0.200	13.00	13.00	13.00	13.00	13.00
0.250	13.01	13.01	13.01	13.01	13.01
0.300	13.01	13.01	13.01	13.01	13.01
0.350	13.01	13.01	13.01	13.01	13.01
0.400	13.01	13.01	13.02	13.02	13.02
0.450	13.02	13.02	13.02	13.02	13.02
0.500	13.02	13.02	13.02	13.02	13.02
0.550	13.02	13.02	13.02	13.02	13.02
0.600	13.02	13.02	13.03	13.03	13.03
0.650	13.03	13.03	13.03	13.03	13.03
0.700	13.03	13.03	13.03	13.03	13.03
0.750	13.03	13.03	13.04	13.04	13.04
0.800	13.04	13.04	13.04	13.04	13.04
0.850	13.04	13.04	13.04	13.04	13.04
0.900	13.05	13.05	13.05	13.05	13.05
0.950	13.05	13.05	13.05	13.05	13.05
1.000	13.05	13.05	13.05	13.05	13.06
1.050	13.06	13.06	13.06	13.06	13.06
1.100	13.06	13.06	13.06	13.06	13.06
1.150	13.06	13.07	13.07	13.07	13.07
1.200	13.07	13.07	13.07	13.07	13.07
1.250	13.07	13.08	13.08	13.08	13.08
1.300	13.08	13.08	13.08	13.08	13.08
1.350	13.08	13.08	13.09	13.09	13.09
1.400	13.09	13.09	13.09	13.09	13.09
1.450	13.09	13.10	13.10	13.10	13.10
1.500	13.10	13.10	13.10	13.10	13.10
1.550	13.11	13.11	13.11	13.11	13.11
1.600	13.11	13.11	13.11	13.12	13.12
1.650	13.12	13.12	13.12	13.12	13.12
1.700	13.12	13.12	13.13	13.13	13.13
1.750	13.13	13.13	13.13	13.13	13.14
1.800	13.14	13.14	13.14	13.14	13.14
1.850	13.14	13.15	13.15	13.15	13.15
1.900	13.15	13.15	13.15	13.16	13.16
1.950	13.16	13.16	13.16	13.16	13.17
2.000	13.17	13.17	13.17	13.17	13.17
2.050	13.18	13.18	13.18	13.18	13.18
2.100	13.18	13.19	13.19	13.19	13.19

Time vs. Elevation (ft)

Output Time increment = 0.010 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
2.150	13.19	13.19	13.20	13.20	13.20
2.200	13.20	13.20	13.21	13.21	13.21
2.250	13.21	13.21	13.21	13.22	13.22
2.300	13.22	13.22	13.22	13.23	13.23
2.350	13.23	13.23	13.23	13.24	13.24
2.400	13.24	13.24	13.25	13.25	13.25
2.450	13.25	13.25	13.26	13.26	13.26
2.500	13.26	13.26	13.27	13.27	13.27
2.550	13.27	13.28	13.28	13.28	13.28
2.600	13.28	13.29	13.29	13.29	13.29
2.650	13.30	13.30	13.30	13.30	13.31
2.700	13.31	13.31	13.31	13.32	13.32
2.750	13.32	13.32	13.33	13.33	13.33
2.800	13.33	13.34	13.34	13.34	13.34
2.850	13.35	13.35	13.35	13.35	13.36
2.900	13.36	13.36	13.37	13.37	13.37
2.950	13.37	13.38	13.38	13.38	13.39
3.000	13.39	13.39	13.39	13.40	13.40
3.050	13.40	13.41	13.41	13.41	13.41
3.100	13.42	13.42	13.42	13.43	13.43
3.150	13.43	13.44	13.44	13.44	13.45
3.200	13.45	13.45	13.46	13.46	13.46
3.250	13.47	13.47	13.47	13.48	13.48
3.300	13.48	13.49	13.49	13.49	13.50
3.350	13.50	13.51	13.51	13.51	13.52
3.400	13.52	13.52	13.53	13.53	13.54
3.450	13.54	13.54	13.55	13.55	13.56
3.500	13.56	13.56	13.57	13.57	13.58
3.550	13.58	13.59	13.59	13.60	13.60
3.600	13.61	13.61	13.62	13.62	13.63
3.650	13.63	13.64	13.64	13.65	13.65
3.700	13.66	13.66	13.67	13.67	13.68
3.750	13.68	13.69	13.69	13.70	13.71
3.800	13.71	13.72	13.73	13.73	13.74
3.850	13.75	13.75	13.76	13.77	13.78
3.900	13.78	13.79	13.80	13.81	13.82
3.950	13.83	13.83	13.84	13.85	13.86
4.000	13.87	13.88	13.89	13.90	13.90
4.050	13.91	13.92	13.94	13.95	13.97
4.100	13.99	14.01	14.03	14.05	14.08
4.150	14.11	14.14	14.17	14.21	14.24
4.200	14.28	14.32	14.35	14.39	14.42
4.250	14.44	14.47	14.49	14.51	14.53

Time vs. Elevation (ft)

Output Time increment = 0.010 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
4.300	14.55	14.56	14.57	14.58	14.58
4.350	14.59	14.59	14.59	14.60	14.60
4.400	14.60	14.60	14.61	14.61	14.61
4.450	14.61	14.61	14.61	14.61	14.62
4.500	14.62	14.62	14.62	14.62	14.62
4.550	14.62	14.62	14.62	14.62	14.62
4.600	14.62	14.62	14.62	14.62	14.62
4.650	14.62	14.62	14.62	14.62	14.62
4.700	14.62	14.62	14.62	14.62	14.62
4.750	14.62	14.62	14.62	14.62	14.62
4.800	14.62	14.62	14.62	14.61	14.61
4.850	14.61	14.61	14.61	14.61	14.61
4.900	14.61	14.61	14.61	14.61	14.61
4.950	14.61	14.60	14.60	14.60	14.60
5.000	14.60	14.60	14.60	14.60	14.60
5.050	14.60	14.60	14.59	14.59	14.59
5.100	14.59	14.59	14.59	14.59	14.59
5.150	14.59	14.58	14.58	14.58	14.58
5.200	14.58	14.58	14.58	14.58	14.58
5.250	14.57	14.57	14.57	14.57	14.57
5.300	14.57	14.57	14.57	14.57	14.56
5.350	14.56	14.56	14.56	14.56	14.56
5.400	14.56	14.56	14.56	14.55	14.55
5.450	14.55	14.55	14.55	14.55	14.55
5.500	14.55	14.54	14.54	14.54	14.54
5.550	14.54	14.54	14.54	14.54	14.54
5.600	14.53	14.53	14.53	14.53	14.53
5.650	14.53	14.53	14.53	14.52	14.52
5.700	14.52	14.52	14.52	14.52	14.52
5.750	14.52	14.52	14.51	14.51	14.51
5.800	14.51	14.51	14.51	14.51	14.51
5.850	14.51	14.50	14.50	14.50	14.50
5.900	14.50	14.50	14.50	14.50	14.49
5.950	14.49	14.49	14.49	14.49	14.49
6.000	14.49	14.49	14.48	14.48	14.48
6.050	14.48	14.48	14.48	14.48	14.47
6.100	14.47	14.47	14.47	14.47	14.46
6.150	14.46	14.46	14.46	14.45	14.45
6.200	14.45	14.45	14.44	14.44	14.44
6.250	14.44	14.43	14.43	14.43	14.43
6.300	14.43	14.42	14.42	14.42	14.42
6.350	14.41	14.41	14.41	14.41	14.41
6.400	14.40	14.40	14.40	14.40	14.40

Time vs. Elevation (ft)

Output Time increment = 0.010 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
6.450	14.39	14.39	14.39	14.39	14.39
6.500	14.38	14.38	14.38	14.38	14.37
6.550	14.37	14.37	14.37	14.37	14.36
6.600	14.36	14.36	14.36	14.36	14.36
6.650	14.35	14.35	14.35	14.35	14.35
6.700	14.34	14.34	14.34	14.34	14.34
6.750	14.33	14.33	14.33	14.33	14.33
6.800	14.32	14.32	14.32	14.32	14.32
6.850	14.32	14.31	14.31	14.31	14.31
6.900	14.31	14.30	14.30	14.30	14.30
6.950	14.30	14.30	14.29	14.29	14.29
7.000	14.29	14.29	14.29	14.28	14.28
7.050	14.28	14.28	14.28	14.28	14.27
7.100	14.27	14.27	14.27	14.27	14.27
7.150	14.26	14.26	14.26	14.26	14.26
7.200	14.26	14.25	14.25	14.25	14.25
7.250	14.25	14.25	14.24	14.24	14.24
7.300	14.24	14.24	14.24	14.24	14.23
7.350	14.23	14.23	14.23	14.23	14.23
7.400	14.22	14.22	14.22	14.22	14.22
7.450	14.22	14.22	14.21	14.21	14.21
7.500	14.21	14.21	14.21	14.20	14.20
7.550	14.20	14.20	14.20	14.20	14.20
7.600	14.19	14.19	14.19	14.19	14.19
7.650	14.19	14.19	14.18	14.18	14.18
7.700	14.18	14.18	14.18	14.18	14.17
7.750	14.17	14.17	14.17	14.17	14.17
7.800	14.17	14.16	14.16	14.16	14.16
7.850	14.16	14.16	14.16	14.15	14.15
7.900	14.15	14.15	14.15	14.15	14.15
7.950	14.15	14.14	14.14	14.14	14.14
8.000	14.14	14.14	14.14	14.13	14.13
8.050	14.13	14.13	14.13	14.13	14.13
8.100	14.13	14.12	14.12	14.12	14.12
8.150	14.12	14.12	14.12	14.11	14.11
8.200	14.11	14.11	14.11	14.11	14.11
8.250	14.11	14.10	14.10	14.10	14.10
8.300	14.10	14.10	14.10	14.10	14.09
8.350	14.09	14.09	14.09	14.09	14.09
8.400	14.09	14.09	14.08	14.08	14.08
8.450	14.08	14.08	14.08	14.08	14.07
8.500	14.07	14.07	14.07	14.07	14.07
8.550	14.07	14.07	14.06	14.06	14.06

Subsection: Time vs. Elevation | Return Event: 100 years
Label: Node 225 (IN) | Storm Event:

Time vs. Elevation (ft)

Output Time increment = 0.010 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
8.600	14.06	14.06	14.06	14.06	14.06
8.650	14.06	14.05	14.05	14.05	14.05
8.700	14.05	14.05	14.05	14.05	14.04
8.750	14.04	14.04	14.04	14.04	14.04
8.800	14.04	14.04	14.03	14.03	14.03
8.850	14.03	14.03	14.03	14.03	14.03
8.900	14.02	14.02	14.02	14.02	14.02
8.950	14.02	14.02	14.02	14.01	14.01
9.000	14.01	14.01	14.01	14.01	14.01
9.050	14.01	14.01	14.00	14.00	14.00
9.100	14.00	14.00	14.00	14.00	14.00
9.150	13.99	13.99	13.99	13.99	13.99
9.200	13.99	13.99	13.99	13.98	13.98
9.250	13.98	13.98	13.98	13.98	13.98
9.300	13.98	13.98	13.97	13.97	13.97
9.350	13.97	13.97	13.97	13.97	13.97
9.400	13.96	13.96	13.96	13.96	13.96
9.450	13.96	13.96	13.96	13.95	13.95
9.500	13.95	13.95	13.95	13.95	13.95
9.550	13.95	13.94	13.94	13.94	13.94
9.600	13.94	13.94	13.94	13.94	13.93
9.650	13.93	13.93	13.93	13.93	13.93
9.700	13.93	13.93	13.92	13.92	13.92
9.750	13.92	13.92	13.92	13.92	13.92
9.800	13.91	13.91	13.91	13.91	13.91
9.850	13.91	13.91	13.90	13.90	13.90
9.900	13.90	13.90	13.90	13.90	13.90
9.950	13.89	13.89	13.89	13.89	13.89
10.000	13.89	13.89	13.89	13.88	13.88
10.050	13.88	13.88	13.88	13.88	13.88
10.100	13.87	13.87	13.87	13.87	13.87
10.150	13.87	13.87	13.87	13.86	13.86
10.200	13.86	13.86	13.86	13.86	13.86
10.250	13.85	13.85	13.85	13.85	13.85
10.300	13.85	13.85	13.85	13.84	13.84
10.350	13.84	13.84	13.84	13.84	13.84
10.400	13.83	13.83	13.83	13.83	13.83
10.450	13.83	13.83	13.83	13.82	13.82
10.500	13.82	13.82	13.82	13.82	13.82
10.550	13.81	13.81	13.81	13.81	13.81
10.600	13.81	13.81	13.80	13.80	13.80
10.650	13.80	13.80	13.80	13.80	13.79
10.700	13.79	13.79	13.79	13.79	13.79

Time vs. Elevation (ft)

Output Time increment = 0.010 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
10.750	13.79	13.78	13.78	13.78	13.78
10.800	13.78	13.78	13.78	13.77	13.77
10.850	13.77	13.77	13.77	13.77	13.77
10.900	13.76	13.76	13.76	13.76	13.76
10.950	13.76	13.76	13.75	13.75	13.75
11.000	13.75	13.75	13.75	13.75	13.74
11.050	13.74	13.74	13.74	13.74	13.74
11.100	13.74	13.73	13.73	13.73	13.73
11.150	13.73	13.73	13.73	13.72	13.72
11.200	13.72	13.72	13.72	13.72	13.71
11.250	13.71	13.71	13.71	13.71	13.71
11.300	13.71	13.70	13.70	13.70	13.70
11.350	13.70	13.70	13.70	13.69	13.69
11.400	13.69	13.69	13.69	13.69	13.68
11.450	13.68	13.68	13.68	13.68	13.68
11.500	13.68	13.67	13.67	13.67	13.67
11.550	13.67	13.67	13.66	13.66	13.66
11.600	13.66	13.66	13.66	13.66	13.65
11.650	13.65	13.65	13.65	13.65	13.65
11.700	13.64	13.64	13.64	13.64	13.64
11.750	13.64	13.63	13.63	13.63	13.63
11.800	13.63	13.63	13.62	13.62	13.62
11.850	13.62	13.62	13.62	13.61	13.61
11.900	13.61	13.61	13.61	13.61	13.61
11.950	13.60	13.60	13.60	13.60	13.60
12.000	13.60	13.59	13.59	13.59	13.59
12.050	13.59	13.59	13.58	13.58	13.58
12.100	13.58	13.58	13.58	13.57	13.57
12.150	13.57	13.57	13.57	13.56	13.56
12.200	13.56	13.56	13.56	13.56	13.55
12.250	13.55	13.55	13.55	13.55	13.55
12.300	13.54	13.54	13.54	13.54	13.54
12.350	13.54	13.53	13.53	13.53	13.53
12.400	13.53	13.53	13.52	13.52	13.52
12.450	13.52	13.52	13.51	13.51	13.51
12.500	13.51	13.51	13.51	13.50	13.50
12.550	13.50	13.50	13.50	13.49	13.49
12.600	13.49	13.49	13.49	13.49	13.48
12.650	13.48	13.48	13.48	13.48	13.47
12.700	13.47	13.47	13.47	13.47	13.47
12.750	13.46	13.46	13.46	13.46	13.46
12.800	13.45	13.45	13.45	13.45	13.45
12.850	13.44	13.44	13.44	13.44	13.44

Time vs. Elevation (ft)

Output Time increment = 0.010 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
12.900	13.44	13.43	13.43	13.43	13.43
12.950	13.43	13.42	13.42	13.42	13.42
13.000	13.42	13.41	13.41	13.41	13.41
13.050	13.41	13.40	13.40	13.40	13.40
13.100	13.40	13.39	13.39	13.39	13.39
13.150	13.39	13.38	13.38	13.38	13.38
13.200	13.38	13.37	13.37	13.37	13.37
13.250	13.37	13.36	13.36	13.36	13.36
13.300	13.36	13.35	13.35	13.35	13.35
13.350	13.35	13.34	13.34	13.34	13.34
13.400	13.33	13.33	13.33	13.33	13.33
13.450	13.32	13.32	13.32	13.32	13.32
13.500	13.31	13.31	13.31	13.31	13.30
13.550	13.30	13.30	13.30	13.30	13.29
13.600	13.29	13.29	13.29	13.29	13.28
13.650	13.28	13.28	13.28	13.27	13.27
13.700	13.27	13.27	13.26	13.26	13.26
13.750	13.26	13.26	13.25	13.25	13.25
13.800	13.25	13.24	13.24	13.24	13.24
13.850	13.24	13.23	13.23	13.23	13.23
13.900	13.22	13.22	13.22	13.22	13.21
13.950	13.21	13.21	13.21	13.20	13.20
14.000	13.20	13.20	13.19	13.19	13.19
14.050	13.19	13.18	13.18	13.18	13.18
14.100	13.18	13.17	13.17	13.17	13.17
14.150	13.16	13.16	13.16	13.16	13.15
14.200	13.15	13.15	13.14	13.14	13.14
14.250	13.14	13.13	13.13	13.13	13.13
14.300	13.12	13.12	13.12	13.12	13.11
14.350	13.11	13.11	13.11	13.10	13.10
14.400	13.10	13.09	13.09	13.09	13.09
14.450	13.08	13.08	13.08	13.08	13.07
14.500	13.07	13.07	13.06	13.06	13.06
14.550	13.06	13.05	13.05	13.05	13.04
14.600	13.04	13.04	13.04	13.03	13.03
14.650	13.03	13.02	13.02	13.02	13.02
14.700	13.01	13.01	13.01	13.01	13.00
14.750	13.00	13.00	13.00	13.00	13.00
14.800	13.00	13.00	13.00	13.00	13.00
14.850	13.00	13.00	13.00	13.00	13.00
14.900	13.00	13.00	13.00	13.00	13.00
14.950	13.00	13.00	13.00	13.00	13.00
15.000	13.00	13.00	13.00	13.00	13.00

Single 8" Underdrain Perforated Pipe

Project Description

Friction Method	Manning Formula	
Solve For	Normal Depth	

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.00113	ft/ft
Diameter	0.67	ft
Discharge	0.37	ft³/s

Results

Normal Depth	0.58	ft
Flow Area	0.32	ft²
Wetted Perimeter	1.61	ft
Hydraulic Radius	0.20	ft
Top Width	0.44	ft
Critical Depth	0.28	ft
Percent Full	87.5	%
Critical Slope	0.00888	ft/ft
Velocity	1.14	ft/s
Velocity Head	0.02	ft
Specific Energy	0.60	ft
Froude Number	0.23	
Maximum Discharge	0.38	ft³/s
Discharge Full	0.35	ft³/s
Slope Full	0.00125	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	87.53	%
Downstream Velocity	Infinity	ft/s

Single 8" Underdrain Perforated Pipe

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.58	ft
Critical Depth	0.28	ft
Channel Slope	0.00113	ft/ft
Critical Slope	0.00888	ft/ft

EMERGENCY SPILLWAY

Subsection: Master Network Summary

Catchments Summary

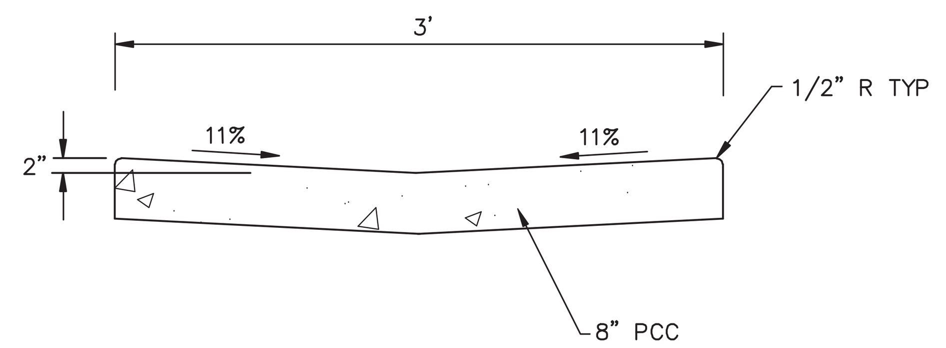
Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
100-year, 6-hour	Watershed - 100	0	1.701	4.200	38.84

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Out 10	Watershed - 100	0	0.010	6.010	0.14

Pond Summary

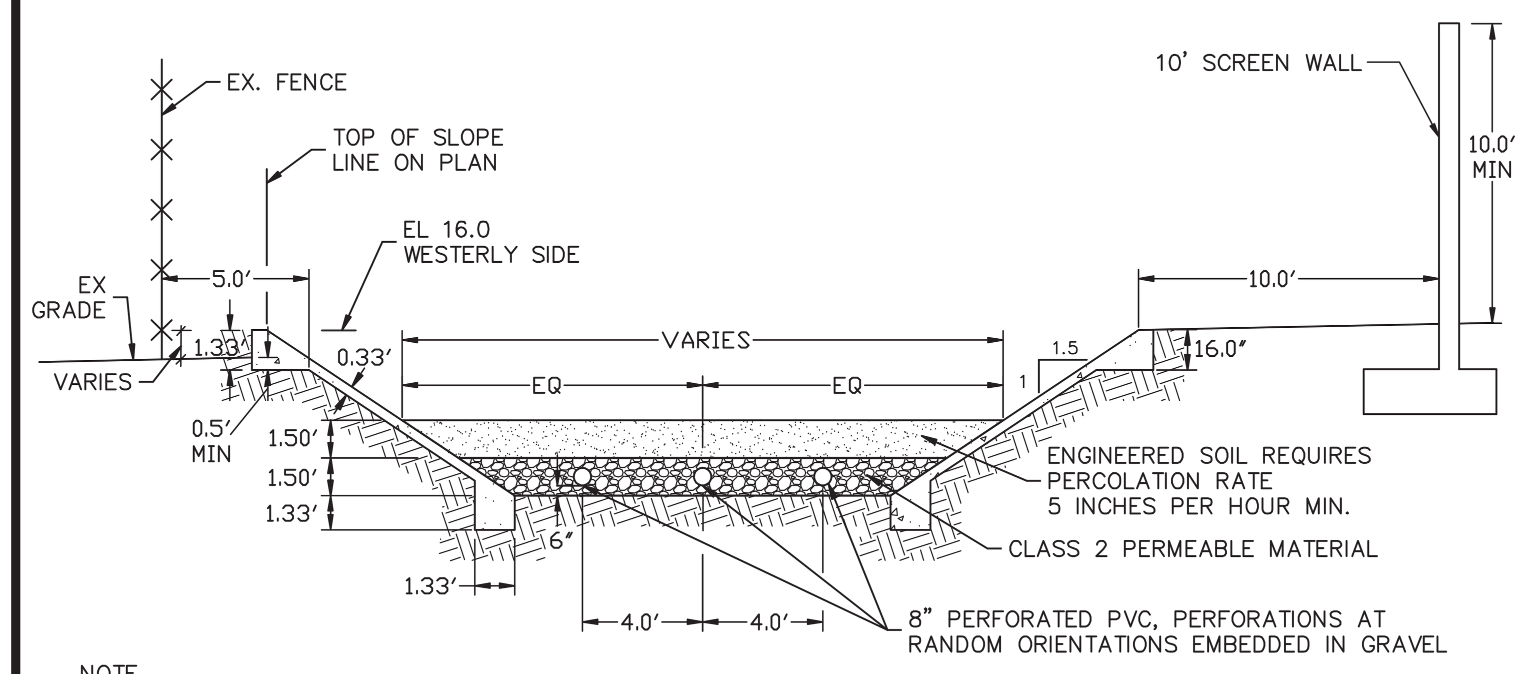
Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Node 225 (IN)	Watershed - 100	0	1.701	4.200	38.84	(N/A)	(N/A)
Node 225 (OUT)	Watershed - 100	0	0.010	6.010	0.14	14.80	1.158



NOTES:
TRANSVERSE WEAKENED PLANE JOINT EVERY 15'.
TRANSVERSE EXPANSION JOINT EVERY 45'.

(A) RIBBON GUTTER

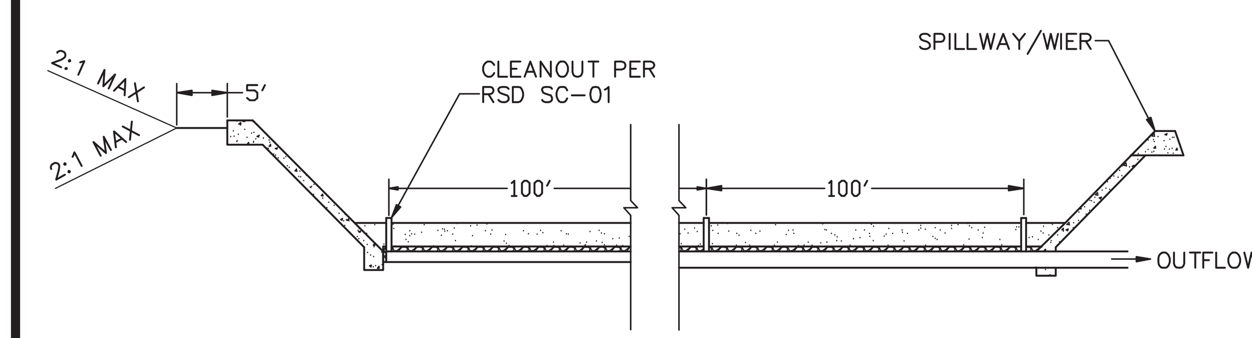
NO SCALE



NOTE
USE RSD D-70 FOR CONCRETE, EXPANSION JOINTS, WEAKENED PLANE JOINTS, AND TYPICAL REINFORCEMENT. WRAP W.W.F. TO TOP OF SLOPE.

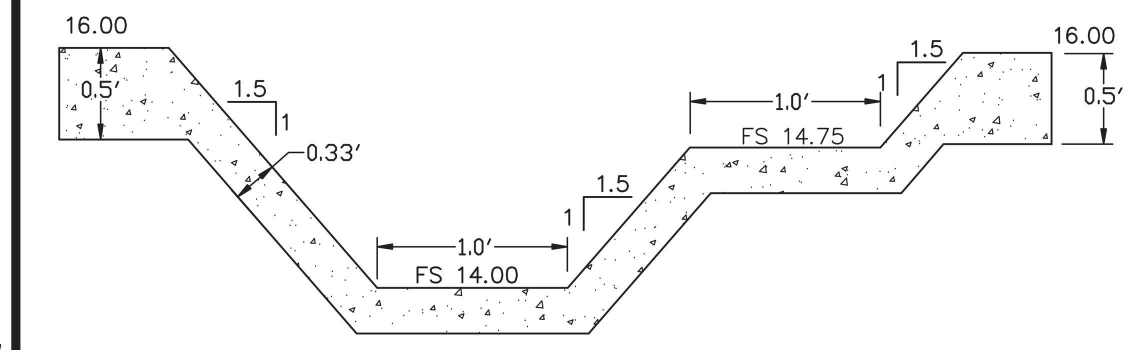
(B) BIORETENTION BASIN SECTION

NO SCALE



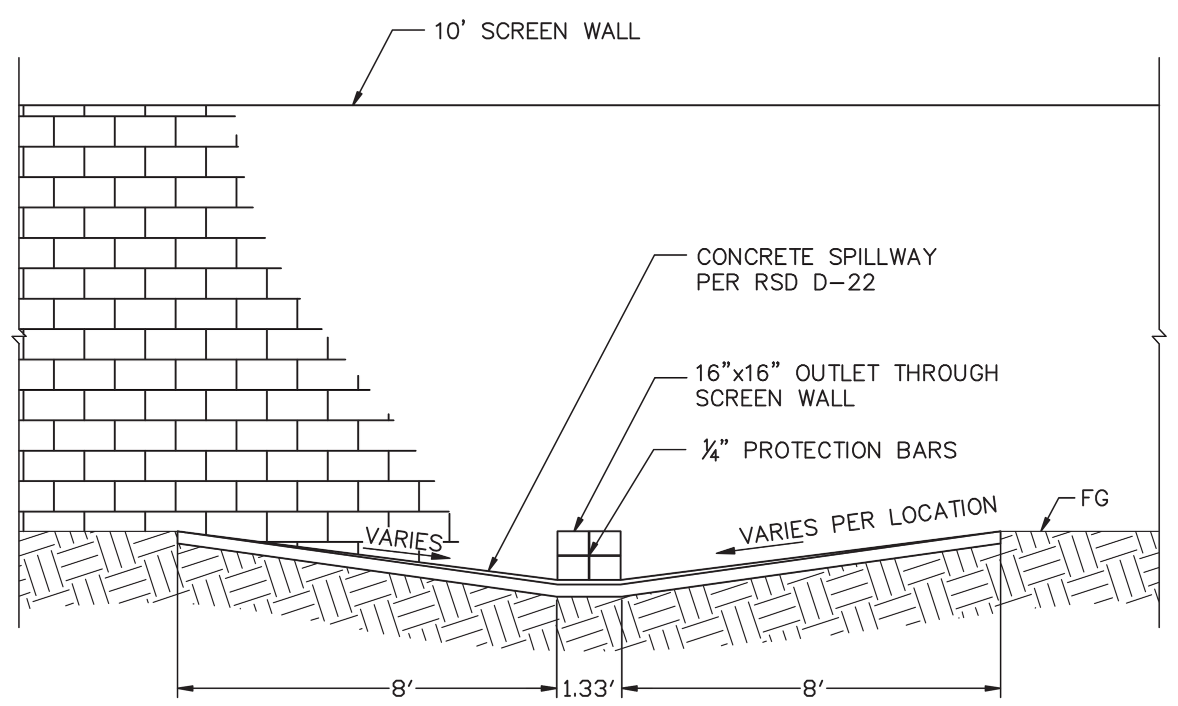
(C) BIORETENTION BASIN

NO SCALE

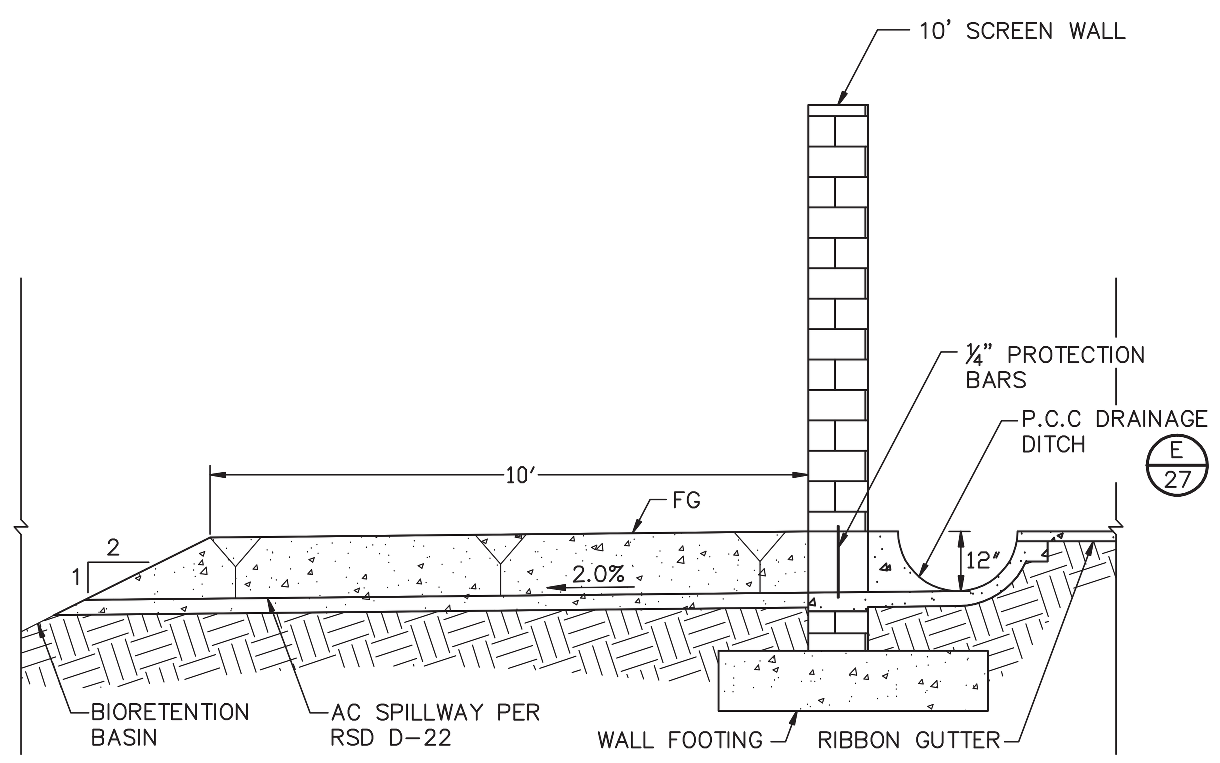


(D) EMERGENCY SPILLWAY AND WEIR

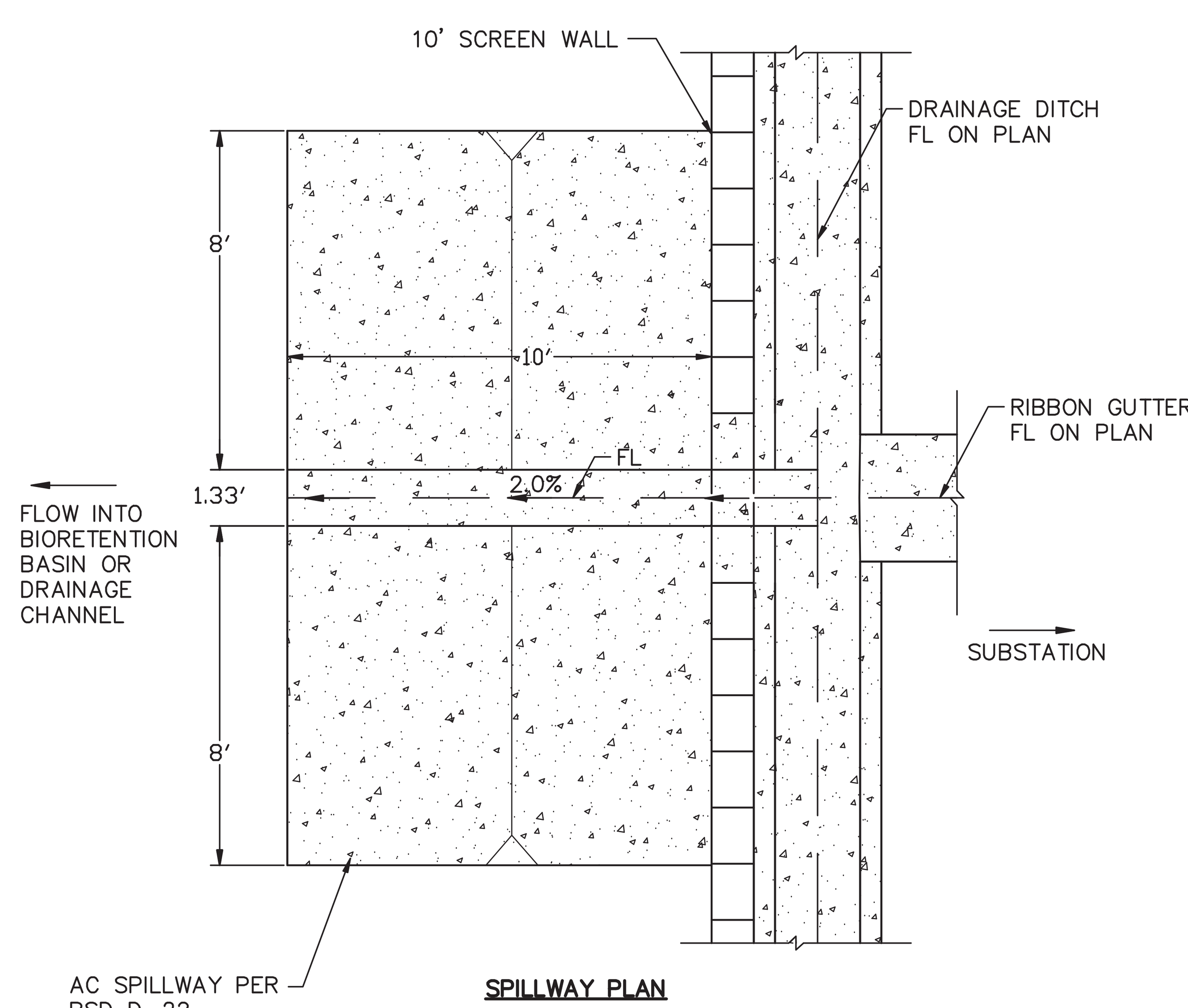
NO SCALE



SPILLWAY ELEVATION–OUTSIDE WALL



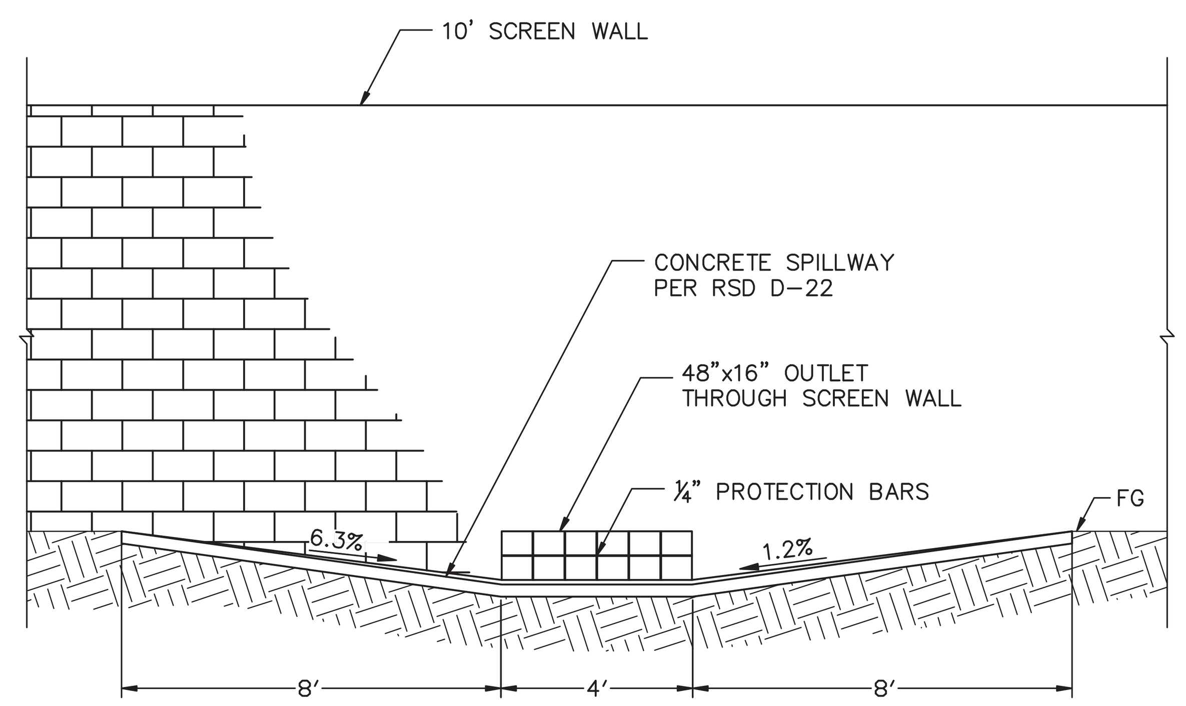
SPILLWAY SECTION



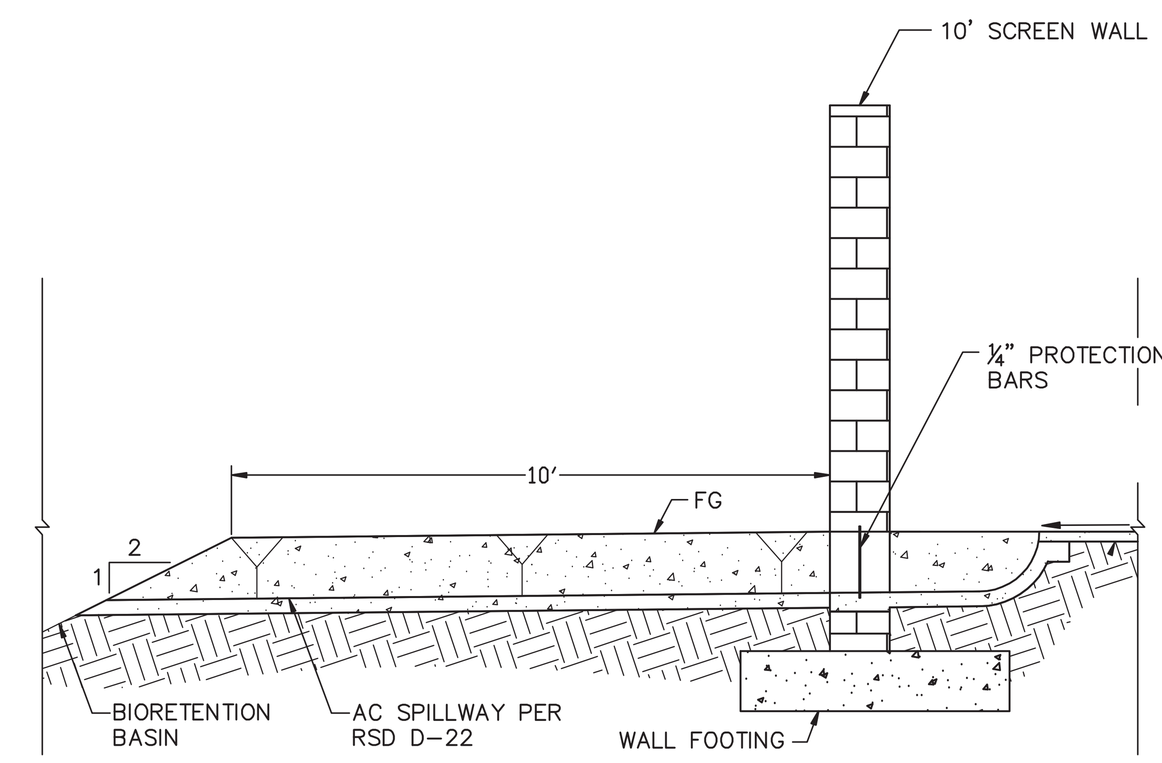
SPILLWAY PLAN

(F) WALL OUTLET SPILLWAY

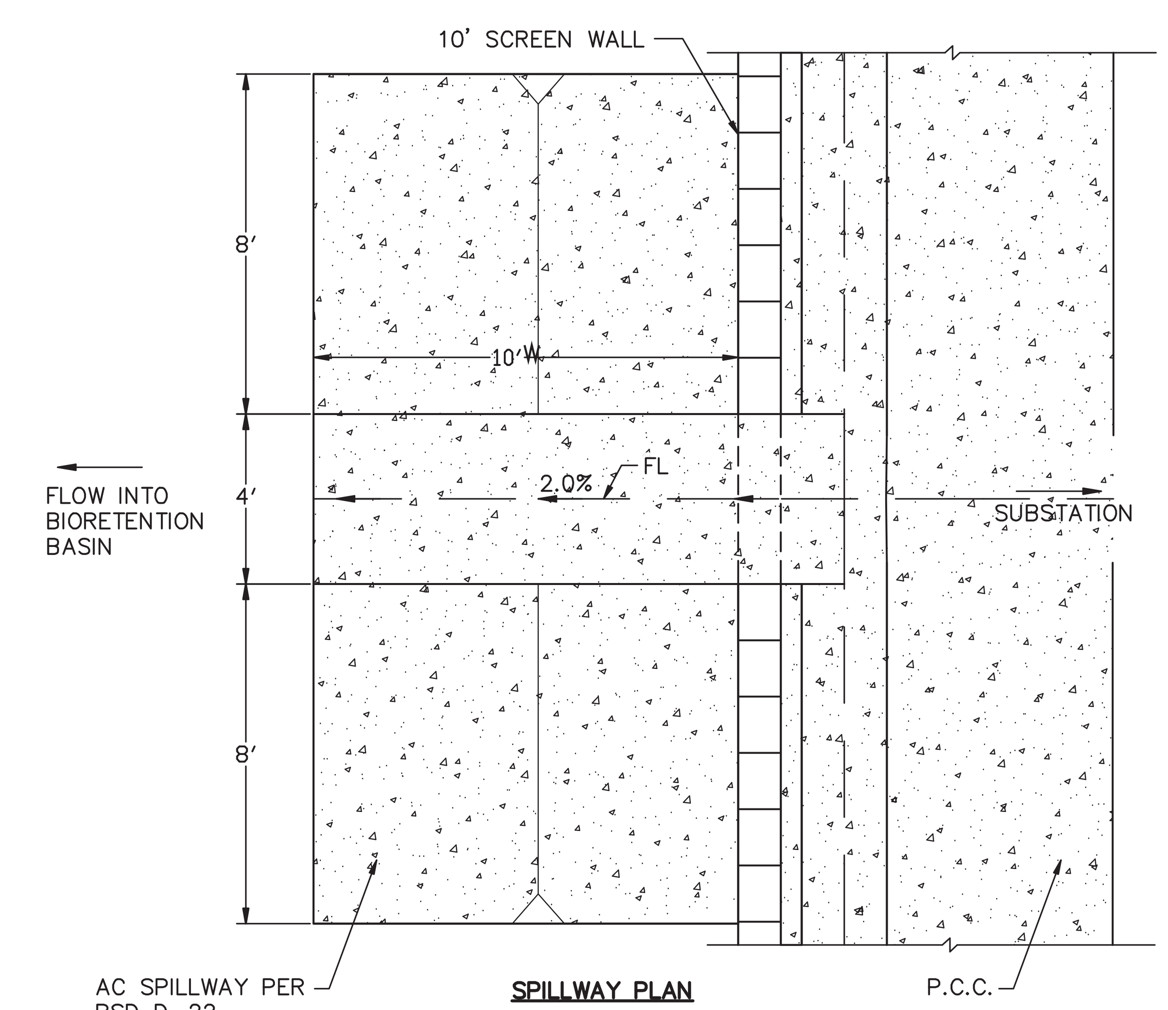
NO SCALE



SPILLWAY ELEVATION–OUTSIDE WALL



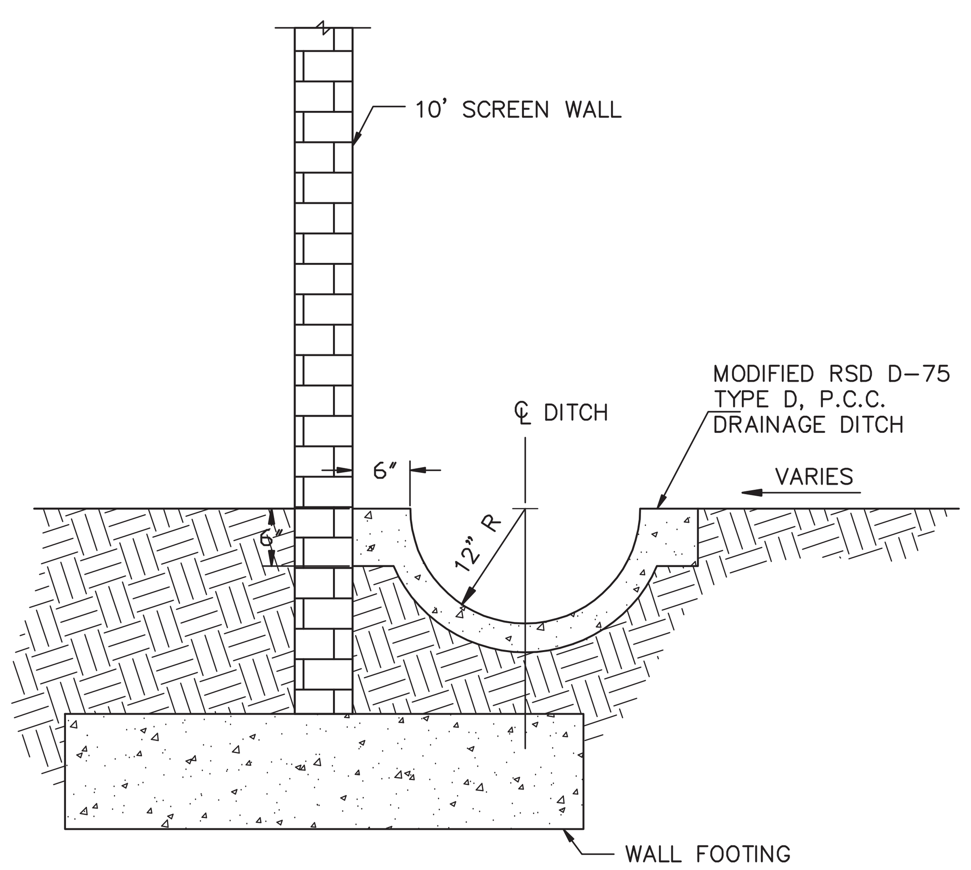
SPILLWAY SECTION



SPILLWAY PLAN

(G) LARGE WALL OUTLET SPILLWAY

NO SCALE



(E) DRAINAGE DITCH AT SCREEN WALL

NO SCALE

NV5
BEYOND ENGINEERING

REVISIONS

NO.	WORK DONE	DATE:	BY:	APP'D:
A	90% SDG&E REVIEW SET	03/20/12	RCF	SRV

SAN DIEGO GAS & ELECTRIC COMPANY
SAN DIEGO, CALIFORNIA

SDG&E BAY BOULEVARD SUBSTATION SITE DEVELOPMENT
DETAILS

DRAWN BY: RCF	DATE: 03/20/12	SCALE: 1"=20'	W.O.:	REV.: 5/7/2012
CHECKED BY: SRV	DATE: 03/20/12			
APPROVED BY: ---	DATE: 03/20/12	SHEET 27 OF 27	BB-C-027	
CAD NO.: GP27	PLOT SCALE: 1' = 1'			

11/16/12

XREFS:

APPENDIX D

APPENDIX E

Culvert Calculator Report
Access Road A

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	22.75	ft	Headwater Depth/Height	0.60	
Computed Headwater Eleva	16.42	ft	Discharge	2.43	cfs
Inlet Control HW Elev.	16.34	ft	Tailwater Elevation	15.51	ft
Outlet Control HW Elev.	16.42	ft	Control Type	Outlet Control	

Grades

Upstream Invert	15.51	ft	Downstream Invert	15.19	ft
Length	63.90	ft	Constructed Slope	0.005008	ft/ft

Hydraulic Profile

Profile	M2		Depth, Downstream	0.59	ft
Slope Type	Mild		Normal Depth	0.64	ft
Flow Regime	Subcritical		Critical Depth	0.59	ft
Velocity Downstream	3.76	ft/s	Critical Slope	0.006671	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.015	
Section Material	Corrugated HDPE (Smooth Interior)		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	16.42	ft	Upstream Velocity Head	0.18	ft
Ke	0.50		Entrance Loss	0.09	ft

Inlet Control Properties

Inlet Control HW Elev.	16.34	ft	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	1.8	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Access Road B

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	20.80	ft	Headwater Depth/Height	0.48	
Computed Headwater Eleva	14.45	ft	Discharge	3.28	cfs
Inlet Control HW Elev.	14.35	ft	Tailwater Elevation	13.51	ft
Outlet Control HW Elev.	14.45	ft	Control Type	Outlet Control	

Grades

Upstream Invert	13.48	ft	Downstream Invert	13.16	ft
Length	65.73	ft	Constructed Slope	0.004868	ft/ft

Hydraulic Profile

Profile	M2		Depth, Downstream	0.63	ft
Slope Type	Mild		Normal Depth	0.67	ft
Flow Regime	Subcritical		Critical Depth	0.63	ft
Velocity Downstream	3.84	ft/s	Critical Slope	0.005938	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.015	
Section Material	Corrugated HDPE (Smooth Interior)		Span	2.00	ft
Section Size	24 inch		Rise	2.00	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	14.45	ft	Upstream Velocity Head	0.20	ft
Ke	0.50		Entrance Loss	0.10	ft

Inlet Control Properties

Inlet Control HW Elev.	14.35	ft	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	3.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Access Road C

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	19.21	ft	Headwater Depth/Height	0.52	
Computed Headwater Eleva	13.43	ft	Discharge	3.74	cfs
Inlet Control HW Elev.	13.32	ft	Tailwater Elevation	12.72	ft
Outlet Control HW Elev.	13.43	ft	Control Type	Outlet Control	

Grades

Upstream Invert	12.39	ft	Downstream Invert	12.14	ft
Length	50.11	ft	Constructed Slope	0.004989	ft/ft

Hydraulic Profile

Profile	M2		Depth, Downstream	0.68	ft
Slope Type	Mild		Normal Depth	0.71	ft
Flow Regime	Subcritical		Critical Depth	0.68	ft
Velocity Downstream	3.99	ft/s	Critical Slope	0.005957	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.015	
Section Material	Corrugated HDPE (Smooth Interior)		Span	2.00	ft
Section Size	24 inch		Rise	2.00	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	13.43	ft	Upstream Velocity Head	0.22	ft
Ke	0.50		Entrance Loss	0.11	ft

Inlet Control Properties

Inlet Control HW Elev.	13.32	ft	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	3.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Access Road D

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	16.45	ft	Headwater Depth/Height	0.76	
Computed Headwater Eleva	14.43	ft	Discharge	3.64	cfs
Inlet Control HW Elev.	14.34	ft	Tailwater Elevation	13.28	ft
Outlet Control HW Elev.	14.43	ft	Control Type	Outlet Control	

Grades

Upstream Invert	13.29	ft	Downstream Invert	12.91	ft
Length	75.91	ft	Constructed Slope	0.005006	ft/ft

Hydraulic Profile

Profile	M2		Depth, Downstream	0.73	ft
Slope Type	Mild		Normal Depth	0.81	ft
Flow Regime	Subcritical		Critical Depth	0.73	ft
Velocity Downstream	4.27	ft/s	Critical Slope	0.007059	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.015	
Section Material	Corrugated HDPE (Smooth Interior)		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	14.43	ft	Upstream Velocity Head	0.22	ft
Ke	0.50		Entrance Loss	0.11	ft

Inlet Control Properties

Inlet Control HW Elev.	14.34	ft	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	1.8	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

APPENDIX F

Node 202 - 50% (2 Blocks)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge	6.44	ft³/s
Centroid Elevation	0.33	ft
Tailwater Elevation	0.33	ft
Discharge Coefficient	0.60	
Opening Width	2.66	ft
Opening Height	0.67	ft

Results

Headwater Elevation	0.90	ft
Headwater Height Above Centroid	0.56	ft
Tailwater Height Above Centroid	0.00	ft
Flow Area	1.78	ft²
Velocity	3.61	ft/s

Node 214 - 50% (12 Blocks)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge	48.04	ft^3/s
Centroid Elevation	0.33	ft
Tailwater Elevation	0.33	ft
Discharge Coefficient	0.60	
Opening Width	16.00	ft
Opening Height	0.67	ft

Results

Headwater Elevation	1.20	ft
Headwater Height Above Centroid	0.87	ft
Tailwater Height Above Centroid	0.00	ft
Flow Area	10.72	ft^2
Velocity	4.48	ft/s

Node 223 - 50% (5 Blocks)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge	19.56	ft^3/s
Centroid Elevation	0.33	ft
Tailwater Elevation	0.33	ft
Discharge Coefficient	0.60	
Opening Width	6.67	ft
Opening Height	0.67	ft

Results

Headwater Elevation	1.16	ft
Headwater Height Above Centroid	0.83	ft
Tailwater Height Above Centroid	0.00	ft
Flow Area	4.47	ft^2
Velocity	4.38	ft/s

Node 111/Area 112 - 50% (1 Block)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge	2.12	ft³/s
Centroid Elevation	0.33	ft
Tailwater Elevation	0.33	ft
Discharge Coefficient	0.60	
Opening Width	1.33	ft
Opening Height	0.67	ft

Results

Headwater Elevation	0.57	ft
Headwater Height Above Centroid	0.24	ft
Tailwater Height Above Centroid	0.00	ft
Flow Area	0.89	ft²
Velocity	2.38	ft/s

Node 111/Area 112 - 50% Weir (1 Block)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge	2.12	ft^3/s
Crest Elevation	0.00	ft
Tailwater Elevation	0.33	ft
Weir Coefficient	2.60	US
Crest Length	1.33	ft
Number Of Contractions	2	

Results

Headwater Elevation	0.85	ft
Headwater Height Above Crest	0.85	ft
Tailwater Height Above Crest	0.33	ft
Flow Area	1.13	ft^2
Velocity	1.88	ft/s
Wetted Perimeter	3.03	ft
Top Width	1.33	ft

WATER QUALITY TECHNICAL REPORT

WATER QUALITY TECHNICAL REPORT

FOR

BAY BOULEVARD SUBSTATION

Prepared for:
San Diego Gas and Electric Company

Prepared By
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San Diego, CA 92128

April 2, 2014

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

This Water Quality Technical Report is being prepared for the new Bay Boulevard 230/69/12 kV substation as part of SDG&E's South Bay Substation Relocation Project. The new Bay Boulevard Substation will require approximately 15 acres of grading spanning over two parcels. The total graded area includes the substation pad, grading of slopes, driveway and access roads and construction of a bioretention facility to control storm water runoff from the site.

The proposed South Bay Substation Relocation Project is located in the City of Chula Vista, California in the southwesterly portion of San Diego County between Bay Boulevard and the San Diego Bay. The proposed Bay Boulevard Substation is situated approximately two miles south of the City of National City, approximately five miles northeast of the City of Imperial Beach, and approximately seven miles southeast of downtown San Diego (See Attachment A).

1.2 HYDROLOGIC UNIT CONTRIBUTION

According to the San Diego Regional Water Quality Control Board's (RWQCB) San Diego Hydrologic Basin Planning Area Map, the Bay Boulevard Substation project is located within the Otay Valley Hydrologic Area within the Otay Hydrologic Unit (910.2). A copy of the RWQCB Basin Planning Map with the project site denoted is attached (See Attachment B). Elevations across the site range from 10.3 feet to 21.5 feet.

2.0 WATER QUALITY ENVIRONMENT

2.1 Beneficial Uses

The beneficial uses for the hydrologic unit are included in Tables 1 and 2 and their descriptions are listed below. These tables have been extracted from the Water Quality Control Plan for the San Diego Basin.

MUN – Municipal and Domestic Supply: Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
AGR – Agricultural Supply: Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
IND – Industrial Services Supply: Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
PROC – Industrial Process Supply: Includes uses of water for industrial activities that depend primarily on water quality.

GWR – **Ground Water Recharge**: Includes uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
FRSH – **Freshwater Replenishment**: Includes uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).
NAV – Navigation: Includes uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
REC1 – Contact Water Recreation: Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.
REC2 – Non-Contact Recreation: Includes the uses of water for recreational involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
COMM – Commercial and Sport Fishing: Includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
BIOL – Preservation of Biological Habitats of Special Significance: Includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.
EST – Estuarine Habitat: Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
WARM – Warm Freshwater Habitat: Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.
WILD – Wildlife Habitat: Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife, (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
RARE – Rare, Threatened, or Endangered Species: Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.
AQUA – Aquaculture: Includes the uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
SPWN – Spawning, Reproduction, and/or Early Development: Includes uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. This use is applicable only for the protection of anadromous fish.
SHELL – Shellfish Harvesting: Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

MIGR - Migration of Aquatic Organisms: Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
MAR - Marine Habitat: Includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

2.1.1 Coastal Waters

Beneficial uses for San Diego Bay are shown in Table 1.

Table 1: Beneficial Uses of Coastal Waters (San Diego Bay)

Hydrologic Unit Number	IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
910.20	X	X	X	X	X	X	X	X	X	X		X	X		X

2.1.2 Groundwater

Groundwater beneficial uses for Otay Valley include Municipal, Agricultural, and Industrial uses.

Table 2: Beneficial Uses for Groundwater (Otay Valley)

Hydrologic Unit Number	MUN	AGR	IND	PROC	GWR	FRSH
910.20	X	X	X			

2.2 303(d) Status

The project location and watersheds have been compared to the 2008-2010 Approved 303(d) list of impaired water bodies. The nearest water body is the San Diego Bay. The San Diego Bay is impaired for copper at the Chula Vista Marina which is located approximately 0.5 miles from the project location. All of San Diego Bay (10,783 acres) is also on the 303(d) list for PCBs (Polychlorinated biphenyls). Runoff generated within the project area discharges into the San Diego Bay, near the Chula Vista Marina.

3.0 CHARACTERIZATION OF PROJECT RUNOFF

3.1 Existing and Post-Construction Drainage

Substation
The proposed substation will impact three (3) drainage basins. The proposed substation will maintain two existing discharge points, one at the *northwest* corner and one at the *southwest* corner of the site. Two (2) of the basins will drain to the *southwest* corner of the substation into salt evaporation ponds while the third drains to the *northwest* corner of

the substation and then conveyed by an existing channel to the San Diego Bay. There are no proposed impervious areas within the third basin that drains to the existing channel.

The proposed substation will increase the impervious area project footprint to approximately 15-20%, which mostly includes a paved driveway, asphalt concrete access roads, and rooftops within the substation. The substation pads and slopes will be surfaced with Class II base which is permeable and allows some storm water filtration. The remainder of storm water runoff that does not permeate through the Class II base will be directed to the bioretention basin or the existing channel and conveyed to one of the two discharge points. The bioretention basin is designed for post-construction water quality treatment per the requirements of the City of Chula Vista Development Storm Water Manual (January 2011). Existing and proposed drainage patterns and flows can be seen in detail on the Post-Construction BMP map in Appendix C. A separate Drainage Study memorandum entitled "Drainage Study for Bay Boulevard Substation", December 2013 by Nolte Associates (NV5) can be referred to for greater detail on existing and proposed drainage conditions.

3.2 Hydromodification Analysis

The proposed substation is exempt to hydromodification requirements due to the fact that it will discharge directly to the San Diego Bay. The Final Hydromodification Management Plan (FHMP) developed by San Diego County includes exemptions for projects that discharge into the San Diego Bay. A separate Technical Memorandum, "Hydromodification Requirements for Bay Boulevard Substation," February 21, 2014 by Nolte Associates (NV5) can be referenced for more detail on the FHMP and why this project is exempt from requirements. The technical memo is included in Attachment D of this WQTR.

3.3 Post-Construction Expected Discharges

The table below shows the anticipated pollutants expected for the project based on the priority project type and proposed improvements. Anticipated pollutants for the substation include sediment from dirt areas, heavy metals from equipment and vehicles, organic compounds from cleaning fluids or solvents, pesticides and nutrients from landscaped areas, trash and debris from humans, and oil and grease from vehicles.

Table 3: Anticipated and Potential Pollutants by Land Use Type for the Bay Boulevard Substation
*The table is based on Section D.1.d(1) of the Municipal Permit and Section 3, Table 3.1 of the City of Chula Vista Development Stormwater Manual.
(X = anticipated; P= Potential)

Land Use Type	Sediment	Nutrients	Heavy Metals	Organic Compounds	Trash and Debris	Oxygen demanding Substances	Oil and Grease	Bacteria and Viruses	Pesticides
Commercial /Light Industrial	$P^{(1)}$	$P^{(1)}$		$P^{(2)}$	X	$P^{(5)}$	X	$P^{(3)}$	$P^{(5)}$
Streets, Highways, & Freeways	X	$P^{(1)}$	X	$X^{(4)}$	X	$P^{(5)}$	X		

(1) A potential pollutant if landscaping exists on-site
(2) A potential pollutant if the project includes uncovered parking areas
(3) A potential pollutant if land use involves food or animal waste products
(4) Including petroleum hydrocarbons
(5) Including solvents

3.4 Soil Characteristics

The project area contains soils that consist primarily of hydrologic Soil Groups D and averaging 2-9% slopes according to USDA/NRCS Published Soil Maps. According to Chapter 7 of the USDA/NRCS Part 630 Hydrology National Engineering Handbook, Group D soils have a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist mainly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a clay-pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission. Further detailed information concerning the existing soils on site can be found in the Geotechnical Investigation report prepared by GEOCON on July 20, 2007.

4.0 MITIGATION MEASURES TO PROTECT WATER QUALITY

To address water quality for the project, BMPs will be implemented during construction and post-construction.

4.1 Construction BMPs

This project disturbs more than one acre of land and will require preparation of a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Stat's General Construction Permit (Order No. 2009-0009-DWQ and subsequent amendments). Construction BMPs will be included in the project's SWPPP. Some of the potential temporary BMPs that may be included in the SWPPP as part of the construction phase include:

- Silt Fence
- Fiber Rolls
- Desilting Basin
- Gravel Bag Berm

- Street Sweeping and Vacuuming
- Storm Drain Inlet Protection
- Stockpile Management
- Solid Waste Management
- Stabilized Construction Entrance/Exit
- Dewatering Operations
- Vehicle and Equipment Maintenance
- Erosion Control Mats and Spray-on Techniques
- Material Delivery and Storage
- Spill Prevention and Control
- Concrete Waste Management
- Water Conservation Practices
- Paving and Grinding Operations
- Temp. Construction entrance with gravel pad

4.2 Post-Construction BMPs

4.2.1 SITE DESIGN & LOW IMPACT DEVELOPMENT (LID)

To minimize storm water impacts, site design measures have been addressed during the initial planning and design stages. The following checklist referenced from the County of San Diego Stormwater Management Plan template provides options for avoiding or reducing potential impacts during project planning. Those checked as “YES” were used for this project. Further explanation of options is described after Table 4.

Table 4: Site and LID Design Measures

	OPTIONS		YES	NO	N/A
1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?			X	
2.	Is the project designed to minimize impervious footprint?		X		
3.	Is the project conserving natural areas where feasible?		X		
4.	Where landscape is proposed, are rooftops, impervious sidewalks, walkways, trails and patios be drained into adjacent landscaping?			X	
5.	For roadway projects, are structures and bridges designed or located to reduce work in live streams and minimize construction impacts?				X
6.	Can any of the following methods be utilized to minimize erosion from slopes:		X		
	6.a.	Disturbing existing slopes only when necessary?	X		
	6.b.	Minimize cut and fill areas to reduce slope lengths?	X		
	6.c.	Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?			X
	6.d.	Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?			X
	6.e.	Rounding and shaping slopes to reduce concentrated flow?	X		
	6.f.	Collecting concentrated flows in stabilized drains and channels?	X		

1.) The project location has been finalized by the California Public Utilities Commission (CPUC) and the Final Environmental Impact Report (EIR) has been approved.
2.) Class II base will be used at the substation on approximately 80-85% of the pad area and provides some storm water infiltration and water quality treatment.
3.) Yes, to the extent possible. The final project location has been defined in the Project Environmental Assessment (PEA) report and has considered various environmental impacts.
4.) There is some landscaping within the substation footprint but it is minimal and for safety reasons has been designed to be at higher elevation than surrounding road.
5.) This is not a roadway project.
6.) All options were considered in designing slopes except for retaining walls that were not applicable for this project.

LOW IMPACT DEVELOPMENT (LID)

Low Impact Development is a requirement of the City of Chula Vista's Watershed Protection Ordinance and the County of San Diego's Municipal Storm Water Permit. The City currently requires all priority projects that are applying for a grading and/or building permit to incorporate LID measures into project design to the maximum extent practicable. The following LID techniques/measures were incorporated into the project:

- The access roads and site grading have been designed to drain the impervious roadway and graded pads towards a bioretention basin.
- The substation pad will be surfaced with Class II base which will allow some filtration of rain into the existing ground.
- Minimized disturbance to natural drainage by utilizing existing drainage flows and outlets.

4.2.2 SOURCE CONTROL

As indicated by Table 5 on the next page, all source control BMPs were considered during the design phases of this project in accordance with the City of Chula Vista's Stormwater Development Manual (2011). The two source control BMPs that can be utilized for this project include:

1) Storm Drain Inlet stenciling at the curb inlet in Bay Boulevard
2) Design of Efficient Irrigation Systems

Other source control BMPs were considered for the project but were not incorporated because there are no material storage areas or trash storage areas within the project boundaries and because vegetated swales cannot be easily incorporated due to the type of project.

Table 5: Source Control BMP Selection

BMP			YES	NO	N/A
1.	**Provide Storm Drain System Stenciling and Signage**				
	1.a.	Provide stenciling, labeling, or stamping in fresh concrete with "NO DUMPING" signs and maintain legibility of stencils and signs	X		
	1.b.	Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping.			
2.	**Design Outdoors Material Storage Areas to Reduce Pollution Introduction**				X
	2.b.	Place hazardous materials in an enclosure or protect them by secondary containment structures.			
	2.c.	Pave storage areas with impervious pavements graded to prevent site run-on and run-off.			
	2.d.	Provide roof or awning over storage areas.			
3.	**Design Trash Storage Areas to Reduce Pollution Introduction**				X
	3.a.	Pave with an impervious surface, designed not to allow run-on from adjoining areas and screened or walled to prevent off-site transport of trash.			
	3.b.	Provide roof or awning to minimize direct precipitation and prevent run-on.			
4.	**Use Efficient Irrigation Systems & Landscape Design**				
	Design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm drainage system (Best Irrigation Practices). Consider and Implement the following methods:				
	4.a.	Employing rain shutoff devices to prevent irrigation after precipitation.	X		
	4.b.	Designing irrigation systems to each landscape area's specific water requirements.	X		
	4.c.	Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.	X		
	4.d.	Provide water conservation educational materials to future resident/tenants.			
5.	**Private Roads**				X
	The design of private roadway drainage shall use at least one of the following				
	5.a.	Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.			
	5.b.	Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter.			
	5.c.	Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.			

4.2.3 TREATMENT CONTROL

A proposed bioretention swale/basin has been designed for flood control and water quality treatment purposes for this project in accordance with the San Diego County Municipal Permit and the City of Chula Vista Development Storm Water Manual (2011). The majority of impervious area (2.3 acres) will be treated by this bioretention swale.

The substation pad will be graded so the impervious asphalt concrete will drain runoff through three wall cutouts into the bioretention basin on the west side of the substation. The bioretention basin will have 1:1.5 concrete slopes with 18” of engineered soil (sand/compost mix) designed to maintain a five inch per hour infiltration rate and treat storm water runoff. The infiltrated runoff will then drain through a gravel layer, collected by three 8” perforated pipes and carried out to the existing southwest discharge point. Per the San Diego County Standard Urban Stormwater Mitigation Plan (SUSMP) and City of Chula Vista Development Stormwater Manual, bioretention facilities are sized with a surface area at least 0.04 times the effectively impervious tributary area for water quality treatment. Assuming the following runoff coefficients: asphalt concrete roadways have a runoff (C) factor of 1.0 and the Class II base, from on-site drainage analysis, has an assumed runoff factor (C) of 0.75, the following equations were used to determine the minimum surface area for the bioretention facility:

Total impervious tributary area (AC roadway) = 2.3 Acres, C-factor = 1.0
Total pervious tributary areas (Class II Base) = 6.7 Acres, C-factor = 0.75
Total Required Bioretention Facility Surface Area =
[(impervious area)*(C-factor) + (pervious area)*(C-factor)] * (sizing factor) , where sizing factor is assumed to be 0.04.

[(2.3 acres)*(1.0) + (6.7 acres)*(0.75)]*(0.04) = 0.3 acres (required bioretention surface area)
For flood control purposes, the bioretention facility has been designed at 0.7 acres which is greater than the required 0.3 acres that is required for water quality treatment and therefore more than meets the requirements of the County’s MS4 permit and the City of Chula Vista’s Stormwater Design Guidelines.

Bioretention basins are rated highly effective for removing coarse sediment and trash and for removing pollutants that tend to associate with fine particles during treatment and medium effectiveness for pollutants that tend to be dissolved following treatment (see Table 11).

Table 6: Treatment Control BMP Selection Matrix									
Pollutants of Concern	a. Bioretention Facilities (LID)*	b. Settling Basins (Dry Ponds)	c. Wet Ponds and Wetlands	d. Infiltration Facilities or Practices (LID)	e. Media Filters	f. High-rate biofilters	g. High-rate media filters	h. Trash Racks & Hydro-dynamic Devices	i. Vegetated Swales
Coarse Sediment and Trash	High	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low	Medium
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low	Low
Overall Ranking 1 (High) 5 (Low)	**2**	**3**	**2**	**1**	**3**	**4**	**4**	**5**	**4**

Notes on Pollutants of Concern:

In Table 10, Pollutants of Concern are grouped as gross pollutants, pollutants that tend to associate with fine particles, and pollutants that remain dissolved.

Table 7

Pollutant	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment	X	X	
Nutrients		X	X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

5.0 OPERATION AND MAINTENANCE PROGRAM

Long-term maintenance of the bioretention basin will be the responsibility of SDG&E Maintenance staff and any contractors that SDG&E choose to hire to perform the required maintenance. All maintenance activities and frequencies are shown in the tables below. Annual maintenance costs are difficult to predict and are based on the number and size of storm events that occur throughout the year.

Table 8: Bioretention Facility			
Preventative Maintenance and Routine Inspection			
Routine Action	Maintenance Indicator	Measurement Frequency	Maintenance Activity
Inspect underdrains	Evidence of Clogging	Annually prior to start of wet season.	Perform corrective action prior to wet season.
Vegetation Management	Avg. vegetation height greater than 12-inches, emergence of trees or vegetation.	Annually prior to start of wet season.	Cut vegetation to an avg. height of 6 inches and remove any trimmings. Remove any trees or woody vegetation.
Inspect for standing water	Standing Water for more than 96 hours	Annually, 96 hours after a rain event greater than 0.6 inches	Drain Facility. Perform any corrective actions prior to wet season. Consult engineers if immediate solution is not evident.
Sediment Management	Sediment Depth exceeds 10% of the facility design	Annually prior to start of wet season.	Remove and dispose of sediment. Regrade if necessary.
Inspection for trash and debris	Trash and debris are present	Annually prior to start of wet season.	Remove and dispose of trash and debris
Soil repair	Evidence of Erosion	Annually prior to start of wet season.	Reseed/revegetate barren spots prior to wet season.

6.0 SUMMARY/CONCLUSIONS

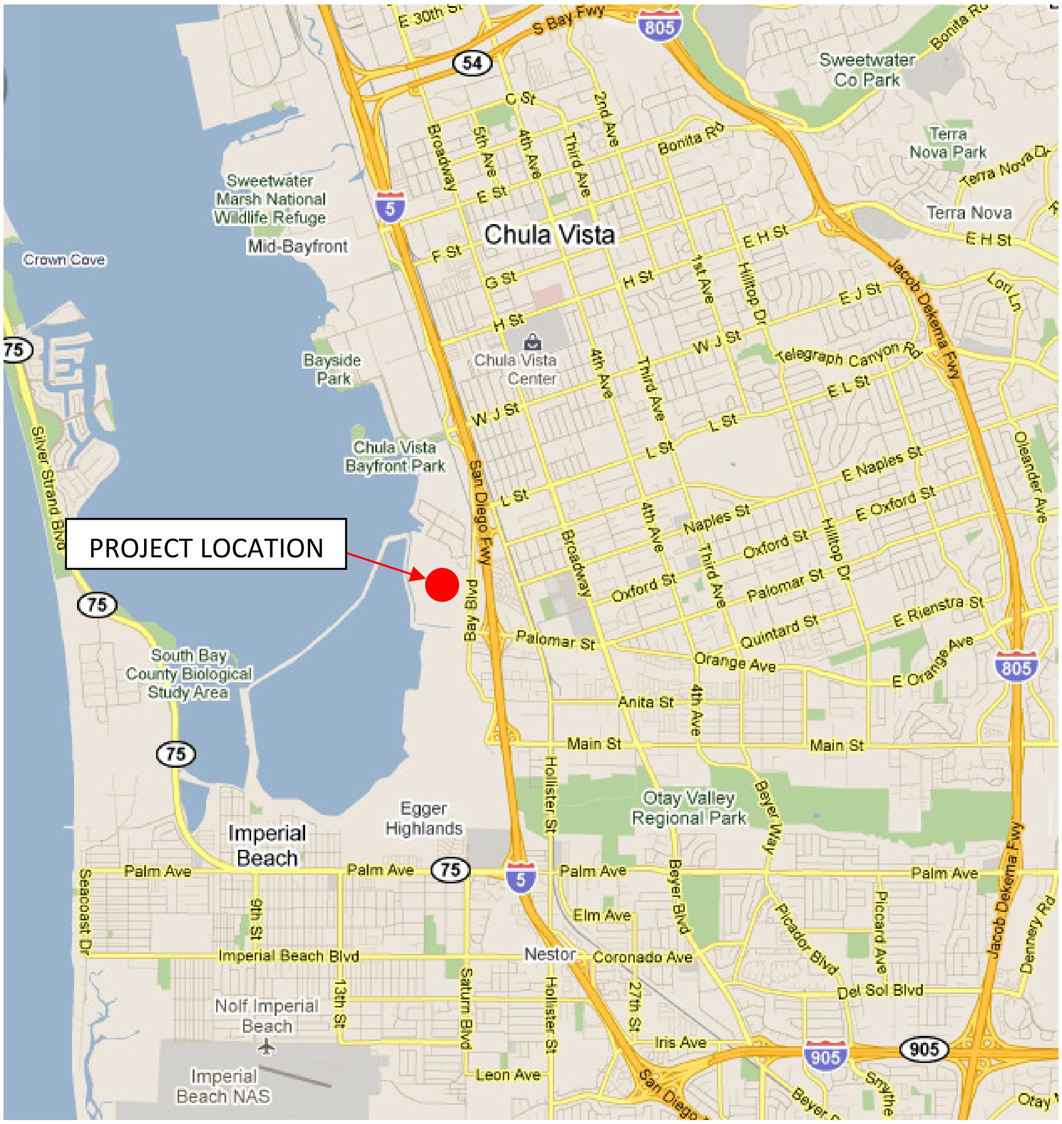
The proposed substation project has potential to introduce pollutants into the San Diego Bay. However, the site's BMPs have been designed to reduce these potential pollutants. The proposed bioretention treatment control facility is designed for sufficient treatment capacity of storm water runoff from the impervious areas of the project. The combination of site control and treatment control BMPs planned for the proposed project will reduce the potential for pollutants being discharged to the Maximum Extent Practicable (MEP). With these BMPs in place, the development will meet the water quality standards by limiting possible storm water impacts. The San Diego Bay will retain the beneficial uses currently identified in the Water Quality Control Plan for the San Diego Basin. The habitat and recreational uses will remain intact and uninterrupted.

ATTACHMENT A

PROJECT LOCATION MAP

VICINITY MAP

BAY BOULEVARD SUBSTATION



ATTACHMENT A

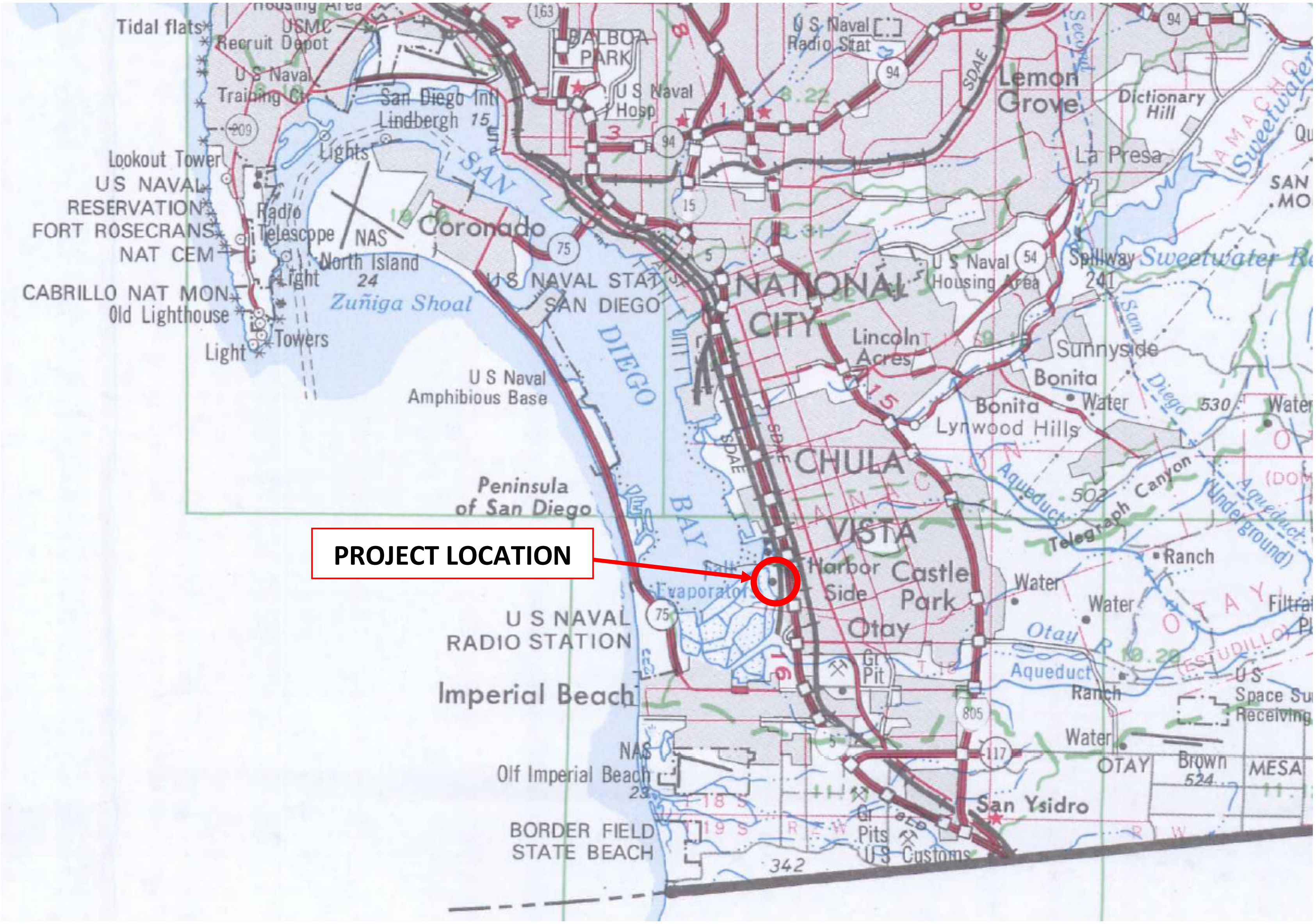
ATTACHMENT B

RWQCB SAN DIEGO BASIN PLANNING MAP

REGIONAL WATER QUALITY CONTROL BOARD

SAN DIEGO REGION (9)

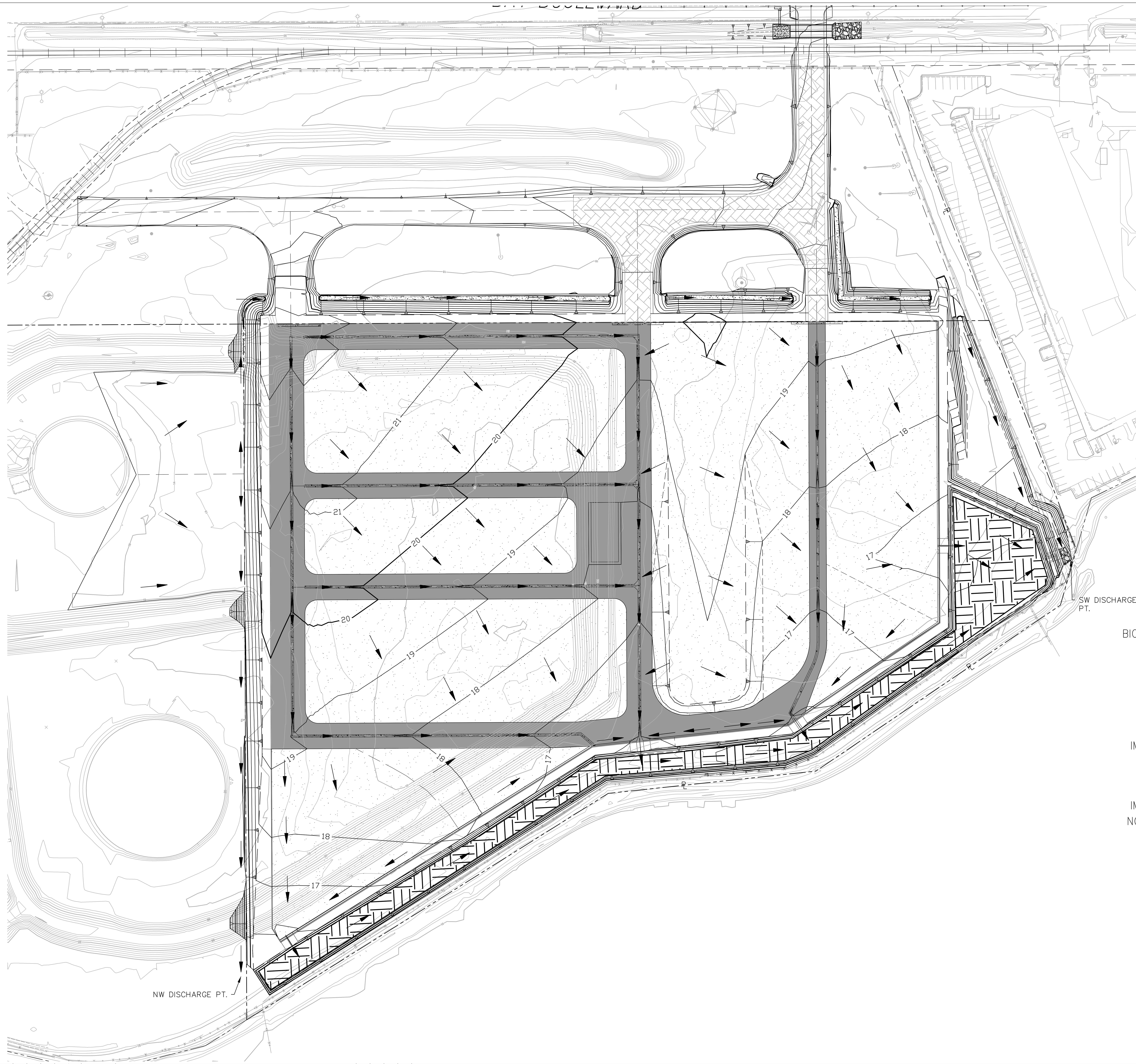
SAN DIEGO HYDOLOGIC BASIN PLANNING AREA (SD)



ATTACHMENT B

ATTACHMENT C

POST-CONSTRUCTION TREATMENT BMP MAP



GRAPHIC SCALE

0' 20' 40' 60' 90' 120' 180' 240'

SCALE: 1"= 60'

LEGEND

BIORETENTION FACILITY 0.9 ac	
PERVIOUS SURFACE TO BIORETENTION 7.3 ac	
IMPERVIOUS SURFACE TO BIORETENTION 2.3 ac	
IMPERVIOUS SURFACE NOT TO BIORETENTION 0.5 ac	
DRAINAGE PATTERN	
SLOPE	

NV5
BEYOND ENGINEERING

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
B	21/MAR/14	ISSUED FOR SDG&E REVIEW	YZ	OA	SRV	SRV	
A	18/DEC/13	ISSUED FOR SDG&E REVIEW	YZ	OA	SRV	SRV	

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B&V PROJECT: 179464

NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

SAN DIEGO GAS & ELECTRIC COMPANY
SAN DIEGO, CALIFORNIA

BAY BOULEVARD SUBSTATION
BMP SITE PLAN

DRAWN BY: NV5	DATE:	SCALE: 1"=60'	W.O.	REV. 3/5/2014
CHECKED BY: SRV	DATE:		BB-S-901	
APPROVED BY:	DATE:	1 OF 28		
CAD NO.:	PLOT SCALE: 1' = 1"			

4/2/14

ATTACHMENT D

HYDROMODIFICATION EXEMPTION SUPPORT DOCUMENTIATION

TECHNICAL MEMORANDUM

TO: File

DATE: February 21, 2014

FROM: Jennifer Peterson (Nolte Associates, Inc. (NV5))
PROJ #: SDB058901

SUBJECT: Hydromodification Exemption Justification for Bay Boulevard Substation

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This technical memorandum has been prepared to explain NV5's basis for determining that the Bay Boulevard substation project is exempt from complying with hydromodification requirements.

Background

The need to address hydromodification and its influence on water quality is included in the San Diego Regional Water Board Order R9-2007-001 (Municipal Permit), Provision D.1.g of California Regional Water Quality Control Board San Diego Region Order R9-2007-0001, which requires the San Diego Stormwater Co-permittees implement a Hydromodification Management Plan (HMP) "…to manage increases in runoff discharge rates and durations from all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force."

Following the adoption of the 2007 Municipal Permit, The County and its Co-permittees (including the City of Chula Vista) developed a Final Hydromodification Plan (HMP) which explains in detail how new and redevlopment projects would be required to analyze hydromodification impacts. The final HMP explains the County and Co-Permittees's plan for incorporating Hydromodification requirements into all priority projects. The Final HMP includes an HMP decision matrix for projects to use for determining their individual requirements.

Bay Boulevard Hydromodification Requirements

The CPUC has approved the project. The City of Chula Vista will review the Grading permit application and issue a grading permit for the site. The City has developed its own Storm Water Manual for Development and Redevelopment Projects (dated January 2011) that provides guidance for projects. Based on the City's Storm Water Manual (2011), the Bay Boulevard substation project has been identified as a Priority Project under the following three development categories:

- Commercial Developments greater than one acre (includes light industrial)
- Streets, roads, highways, and freeways (paved access roads will be developed within the substation property for vehicle access)
- Development Projects that result in the disturbance of one acre or more of land

Page 3-42 of the City's Manual references HMP Applicability Requirements for development projects and refers to Figure 3.2 for determining whether a project may be exempt from Hydromodification. Our reasons for exemption are based on the following two exemption criteria:

- If the proposed project discharges runoff directly to an exempt receiving water such as the Pacific Ocean, San Diego Bay, an exempt river reach, an exempt reservoir, or a tidally-influenced area.
- If the proposed project discharges to a stabilized conveyance system that extends to the Pacific Ocean, San Diego Bay, a tidally-influenced area, an exempt river reach or reservoir.

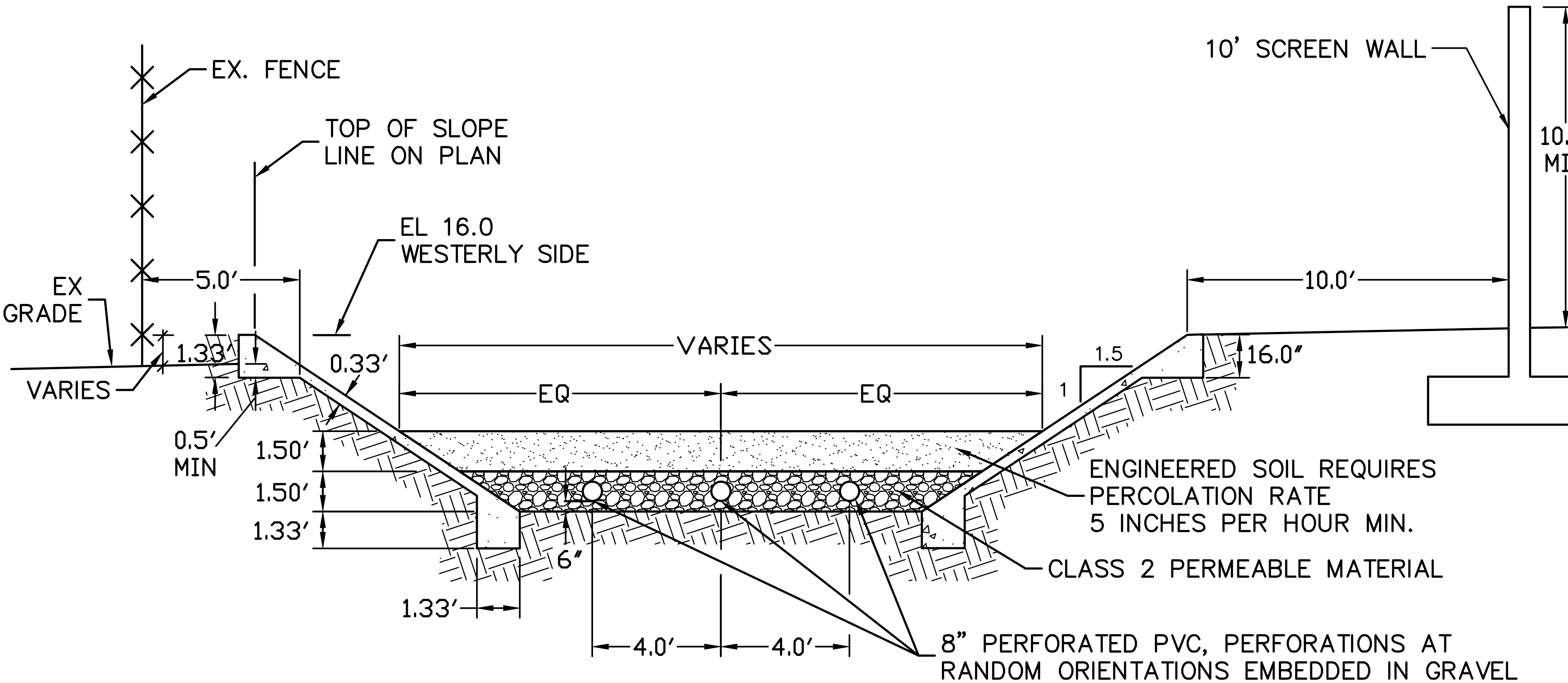
We have filled out the HMP decision matrix and reviewed the above exemptions and believe that the Bay Boulevard project would be exempt due to the fact that it will discharge directly to the San Diego Bay (see attached highlighted matrix). All runoff from the site discharges directly to the existing salt ponds via the southwest discharge point of the site. There is a small portion of the site that does discharge to the north via a hardened conveyance system but this area is not being developed with new impervious areas, only diverted from following the existing drainage patterns to the south.

Conclusions

Based on the City of Chula Vista Storm Water Manual and the County's Final HMP, it is our interpretation that this project will be exempt from hydromodification requirements. We do understand that the project will still need to comply with Low Impact Development (LID) and water quality requirements as necessary per the County's Municipal Permit and the City's Storm Water Manual.

ATTACHMENT E

BIORETENTION FACT SHEETS



NOTE

USE RSD D–70 FOR CONCRETE, EXPANSION JOINTS, WEAKENED PLANE JOINTS, AND TYPICAL REINFORCEMENT. WRAP W.W.F. TO TOP OF SLOPE.

B
—

BIORETENTION BASIN SECTION

NO SCALE

ATTACHMENT F

CERTIFICATION SHEET

This Water Quality Technical Report has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

______________________________ ___________________________

Jennifer M. Peterson, RCE 68721 Date

The Hazardous Substance Management and Emergency Response Plan will be included upon completion.

APPENDIX XX:

ACTIVE TREATMENT SYSTEM (ATS)

Active Treatment Systems are not applicable for this project.

APPENDIX XXI:

BIOASSESSMENT

Bioassessments are not applicable for Risk Level 1 projects.

APPENDIX XXII:

GLOSSARY/ACRONYMS

APPENDIX 5:
Glossary

Active Areas of Construction
All areas subject to land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active areas until final stabilization is complete. [The construction activity Phases used in this General Permit are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase.]

Active Treatment System (ATS)
A treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment.

Acute Toxicity Test
A chemical stimulus severe enough to rapidly induce a negative effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute.

Air Deposition
Airborne particulates from construction activities. .

Approved Signatory
A person who has legal authority to sign, certify, and electronically submit Permit Registration Documents and Notices of Termination on behalf of the Legally Responsible Person.

Beneficial Uses
As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Best Available Technology Economically Achievable (BAT)
As defined by USEPA, BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT)

As defined by USEPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

Best Professional Judgment (BPJ)
The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

Best Management Practices (BMPs)
BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Chain of Custody (COC)
Form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

Coagulation
The clumping of particles in a discharge to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

Common Plan of Development
Generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning documents, such as land use master plans, conceptual master plans, or broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

Daily Average Discharge
The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant

throughout the day (40 CFR 122.2). In the case of pH, the pH must first be converted from a log scale.

Debris
Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

Direct Discharge
A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.

Discharger
The Legally Responsible Person (see definition) or entity subject to this General Permit.

Dose Rate (for ATS)
In exposure assessment, dose (e.g. of a chemical) per time unit (e.g. mg/day), sometimes also called dosage.

Drainage Area
The area of land that drains water, sediment, pollutants, and dissolved materials to a common outlet.

Effluent
Any discharge of water by a discharger either to the receiving water or beyond the property boundary controlled by the discharger.

Effluent Limitation
Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

Erosion
The process, by which soil particles are detached and transported by the actions of wind, water, or gravity.

Erosion Control BMPs
Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

Field Measurements
Testing procedures performed in the field with portable field-testing kits or meters.

Final Stabilization
All soil disturbing activities at each individual parcel within the site have been completed in a manner consistent with the requirements in this General Permit.

First Order Stream
Stream with no tributaries.

Flocculants
Substances that interact with suspended particles and bind them together to form flocs.

Good Housekeeping BMPs
BMPs designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Grading Phase (part of the Grading and Land Development Phase)
Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

Hydromodification
Hydromodification is the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation.

Identified Organisms
Organisms within a sub-sample that is specifically identified and counted.

Inactive Areas of Construction
Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Index Period
The period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers. Instream communities naturally vary over the course of a year,and sampling during the index period ensures that samples are collected during a time frame when communities are stable so that year-to-year consistency is obtained. The index period approach provides a cost-effective alternative to year-round sampling. Furthermore, sampling within the appropriate index period will yield results that are comparable to the assessment thresholds or criteria for a given region, which are established for the same index period. Because index

periods differ for different parts of the state, it is essential to know the index period for your area.

K Factor
The soil erodibility factor used in the Revised Universal Soil Loss Equation (RUSLE). It represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil.

Legally Responsible Person
The person who possesses the title of the land or the leasehold interest of a mineral estate upon which the construction activities will occur for the regulated site. For linear underground/overhead projects, it is in the person in charge of the utility company, municipality, or other public or private company or agency that owns or operates the LUP.

Likely Precipitation Event
Any weather pattern that is forecasted to have a 50% or greater chance of producing precipitation in the project area. The discharger shall obtain likely precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

Maximum Allowable Threshold Concentration (MATC)
The allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

Natural Channel Evolution
The physical trend in channel adjustments following a disturbance that causes the river to have more energy and degrade or aggrade more sediment. Channels have been observed to pass through 5 to 9 evolution types. Once they pass though the suite of evolution stages, they will rest in a new state of equilibrium.

Non-Storm Water Discharges
Discharges are discharges that do not originate from precipitation events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

Non-Visible Pollutants

Pollutants associated with a specific site or activity that can have a negative impact on water quality, but cannot be seen though observation (ex: chlorine). Such pollutants being discharged are not authorized.

Numeric Action Level (NAL)
Level is used as a warning to evaluate if best management practices are effective and take necessary corrective actions. Not an effluent limit.

Original Sample Material
The material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification.

pH
Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

Post-Construction BMPs
Structural and non-structural controls which detain, retain, or filter the release of pollutants to receiving waters after final stabilization is attained.

Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)
Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

Project

Qualified SWPPP Developer
Individual who is authorized to develop and revise SWPPPs.

Qualified SWPPP Practitioner
Individual assigned responsibility for non-storm water and storm water visual observations, sampling and analysis, and responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

Qualifying Rain Event
Any event that produces 0.5 inches or more precipitation with a 48 hour or greater period between rain events.

R Factor
Erosivity factor used in the Revised Universal Soil Loss Equation (RUSLE). The R factor represents the erosivity of the climate at a particular location. An

average annual value of R is determined from historical weather records using erosivity values determined for individual storms. The erosivity of an individual storm is computed as the product of the storm's total energy, which is closely related to storm amount, and the storm's maximum 30-minute intensity.

Rain Event Action Plan (REAP)
Written document, specific for each rain event, that when implemented is designed to protect all exposed portions of the site within 48 hours of any likely precipitation event.

Remaining Sub sampled Material
The material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but the sample needs to be checked and verified using a complete Quality Assurance (QA) plan)

Routine Maintenance
Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Runoff Control BMPs
Measures used to divert runon from offsite and runoff within the site.

Run-on
Discharges that originate offsite and flow onto the property of a separate project site.

Revised Universal Soil Loss Equation (RUSLE)
Empirical model that calculates average annual soil loss as a function of rainfall and runoff erosivity, soil erodibility, topography, erosion controls, and sediment controls.

Sampling and Analysis Plan
Document that describes how the samples will be collected, under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

Sediment
Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation
Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

Sediment Control BMPs
Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

Settleable Solids (SS)
Solid material that can be settled within a water column during a specified time frame. It is typically tested by placing a water sample into an Imhoff settling cone and then allowing the solids to settle by gravity for a given length of time. Results are reported either as a volume (mL/L) or a mass (mg/L) concentration.

Sheet Flow
Flow of water that occurs overland in areas where there are no defined channels where the water spreads out over a large area at a uniform depth.

Site

Soil Amendment
Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water.

Streets and Utilities Phase
Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

Structural Controls
Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution

Suspended Sediment Concentration (SSC)
The measure of the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

Total Suspended Solids (TSS)
The measure of the suspended solids in a water sample includes inorganic substances, such as soil particles and organic substances, such as algae,

aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

Toxicity
The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Turbidity
The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

Vertical Construction Phase
The Build out of structures from foundations to roofing, including rough landscaping.

Waters of the United States
Generally refers to surface waters, as defined by the federal Environmental Protection Agency in 40 C.F.R. § 122.2.[1]

Water Quality Objectives (WQO)
Water quality objectives are defined in the California Water Code as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

[1] The application of the definition of "waters of the United States" may be difficult to determine; there are currently several judicial decisions that create some confusion. If a landowner is unsure whether the discharge must be covered by this General Permit, the landowner may wish to seek legal advice.