

University of California, Irvine

Storm Water Management Plan



March 2003

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1.0 Introduction

1.01 Regulatory Background

This Storm Water Management Plan (SWMP) is required under Federal Environmental Protection Agency Phase II storm water regulations, promulgated under the Clean Water Act. These regulations require UC Irvine to apply for a National Pollution Discharge Elimination System (NPDES) permit by March 2003, and develop a SWMP.

Polluted storm water runoff is often transported to municipal separate storm sewer systems (MS4s) and ultimately discharged into local waterways (rivers, streams, lakes, and bays) without treatment. EPA's Storm Water Phase II Rule establishes an MS4 storm water management program that is intended to improve the nation's waterways by reducing the quantity of pollutants that storm water picks up and carries into storm sewer systems during storm events. Common pollutants include oil and grease from roadways and parking lots, pesticides from lawns, sediment from construction sites, and carelessly discarded trash, such as cigarette butts, paper wrappers and plastic bottles. These pollutants are deposited into nearby waterways, discouraging recreational use of the resource, and interfering with the habitat for fish, other aquatic organisms, and wildlife.

In 1990, EPA promulgated rules establishing Phase I of the NPDES storm water program. The Phase I program for MS4s requires operators of "medium" and "large" MS4s, that is, those that generally serve populations of 100,000 or greater, to implement a storm water management program as a means to control polluted discharges from these MS4s. The Storm Water Phase II Rule extends coverage of the NPDES storm water program to certain "small" MS4s but takes a slightly different approach to how the storm water management program is developed and implemented.

NPDES Phase II regulations require operators of small MS4s to develop a program to:

- Reduce the discharge of pollutants to the "maximum extent practicable" (MEP);
- Protect water quality; and
- Satisfy the appropriate water quality requirements of the Clean Water act and Regional Water Quality Control Board Basin Plan

1.02 Purpose of the SWMP

This document has been developed to comply with Environmental Protection Agency Phase II NPDES requirements promulgated under the Clean Water Act.

The purpose of the SWMP is: (1) to identify pollutant sources potentially affecting the quality and quantity of storm water discharges; (2) to provide Best Management Practices (BMPs) for municipal and small construction activities implemented by UC Irvine staff and contractors and; (3) provide measurable goals for the implementation of this SWMP to reduce the discharge of the identified pollutants into the storm drain system and associated water ways.

EH&S will ensure compliance with the elements contained in this document by working with all responsible campus groups. All groups will receive training and sign the Responsibility Agreement Form.

This SWMP covers the UC Irvine Campus, located in Irvine, California. The UCI Medical Center in Orange, CA is addressed in a separate plan.

1.03 Storm Water Advisory Council

The SWMP was developed with input from representatives from various campus departments with a potential to impact surface water quality. Participants ranged from departmental directors to operations personnel.

UC Irvine Departments

- Environmental Health & Safety
- Facilities Management – Central Plant, Trades, Grounds, Pest Management
- Environmental Planning & Sustainability – Physical and Environmental Planning
- Campus Recreation
- Design and Construction -- Project Management, Inspection Services
- Transportation & Distribution Services
- Housing Administrative Services
- Campus Asset Management – Real Estate, interaction with on-campus leases

2.0 Site Information

2.01 Facility Description

The University of California (UC), Irvine is one of ten UC campuses governed by the Regents of the University of California and is an internationally recognized public teaching and research institution.

The UC Irvine campus is situated in Irvine, California, in central Orange County. The facility is generally bounded by Jamboree Road to the north, Campus Drive to the northeast, Culver Drive to the east, and State Route 73 to the west, and Bonita Canyon Road to the south.

This SWMP covers facilities on the campus. Specific facility information is attached in Appendix 1.

The current 2001-2002 population, which includes students, faculty, staff, visiting scholars, researchers, and visitors, is approximately 23,779. The draft projection for 2010 to 2011 is 27,500 and the draft projection for 2020-2021 is 29,000.*

*Source: Capital Planning Group, Draft Estimated Space Demand, January 2003

2.02 Facility Operation

UC Irvine employs operations, maintenance, custodial, and grounds staff for day-to-day operations. This includes building maintenance (cleaning, painting, repairs), daily cleaning of common buildings, grounds maintenance, small construction jobs, and various repair and maintenance activities. Facilities Management staff and outside contractors perform electrical, plumbing, roofing, asphalt, exterior building painting, sewer line cleaning, utility repairs, and janitorial duties.

3.0 Description of Potential Sources of Pollution

3.01 Potential Pollutant Activity or Sources List

In order to aid in the identification of pollutant sources, the committee that developed this SWMP utilized knowledge on the day-to-day operations to identify activities and sources of potential pollutants of concern.

Best Management Practices (BMP) to address the pollutant sources and activities described below will be developed as described in the Minimum Control Measures (Section 4.03).

Activity/Source	Pollutants of Concern
Building maintenance (washing, graffiti abatement)	Wash water, paint chips, cleaning products, dirt and sediment
Chemical spills	Various cleaning compounds, diesel, paint, hazardous materials, vehicle fluids
Construction activities	Concrete, drywall, paint, sediment
Erosion	Sediment, organic matter
Food service operations	Wash-water, food residue, oil and grease
Grounds maintenance	Green waste, fuel, oil, pesticides, herbicides, sediment
Impervious areas	Increased flows and pollutant loading
Irrigation runoff	Chloramines, fertilizers, pesticides
Litter and debris	Litter and debris
Loading/unloading areas	Petroleum products, fertilizers, pesticides, herbicides, cleaning solutions, paint
Outdoor storage of raw materials	Sand, asphalt, soil, pesticides, herbicides, fertilizer, paint, solvents, fuel
Painting (indoor)	Paint or rinse water (oil and water based), paint thinner
Parking lot runoff	Oil/grease, litter, heavy metals
Roof runoff	Particulate matter and associated pollutants
Sewer line blockages	Raw sewage
Sewer line seepage	Raw sewage
Trash storage areas	Organic materials, hazardous materials
Vehicle and equipment washing (staff)	Cleaning products, oil/grease, vehicle fluids
Utility line maintenance and repairs (water/ irrigation/ sewer)	Chloramines, chlorine, sediment, adhesive cements, primers
Pet feces	Coliform bacteria

4.0 Minimum Control Measures

“Minimum Control Measures” is the term used by the EPA for the six MS4 program elements aimed at achieving improved water quality through NPDES Phase II requirements listed below:

1. Public Education and Outreach
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination
4. Pollution Prevention/Good Housekeeping for Facilities Operation and Maintenance
5. Construction Site Storm Water Runoff Control
6. Post-construction Storm Water Management in New Development and Redevelopment

The goal of the SWMP is to reduce the discharge of pollutants to the Maximum Extent Practicable (MEP), as defined by the EPA, and to identify activities or structural improvements that help improve the quality of the storm water runoff. Best Management Practices (BMPs) have been developed for the SWMP to reduce the discharge of pollutants to the storm drain system to the MEP. BMPs include treatment controls, operating procedures, and practices to control site runoff, spills and leaks, sludge or waste disposal, or drainage from raw material storage. BMPs will be updated as appropriate to comply with additions or changes to NPDES permit requirements.

The BMPs described in the Minimum Control Measures in this SWMP and the source control BMPs provided on UC Irvine’s storm water management webpage are to be implemented by UC Irvine staff and outside contractors. Whenever UC Irvine staff or contractors perform work at UC Irvine, steps outlined in each relevant BMP, or other proven technique that reaches the same goal, may be used to comply with storm water discharge regulations. For construction projects greater than one acre, the BMPs in the project SWPPP must be implemented.

UC Irvine’s SWMP is designed to be a dynamic program that evaluates the effectiveness of the six minimum control measures on a recurring basis. This evaluation is critical to the storm water program framework, which uses the iterative approach of implementing controls, conducting assessments, and revising controls as necessary to improve the effectiveness of the program.

4.01 Public Education and Outreach on Storm Water Impacts

The goal of this minimum control measure is to develop and distribute educational materials and perform outreach to inform students, faculty, and staff about the impact of polluted storm water runoff discharges, and that their actions can make a positive impact on water quality.

MEP Standards

- Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of storm water discharges on local water bodies and the steps that can be taken to reduce storm water pollution;
- Assess the appropriate BMPs and measurable goals for this minimum control measure.

Measurable Goals to Meet MEP Requirements

Schedule	Public Education and Outreach Goals	Dept.
Ongoing	Develop storm water pollution prevention educational material for faculty and staff	EH&S
Ongoing	Label storm drains with "No dumping, Drains to Bay" with stencils	EH&S and FM
Ongoing	Maintain storm water pollution prevention information on UC Irvine website	EH&S
Ongoing	Participate in at least one campus event each year to perform outreach on storm water pollution prevention and distribute educational material to students, faculty and staff	EH&S
Ongoing	Provide educational signage at selected Low Impact Development (LID) treatment control BMP sites for public awareness	EH&S and EP&S

4.02 Public Involvement / Participation

The goal of this minimum control measure is to provide opportunities for the campus community (students, faculty, and staff) to participate in program development and implementation on a storm water management working-group.

MEP Standards

- Comply with applicable State, and local public notice requirements;
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

Measurable Goals to Meet MEP Requirements

Schedule	Public Involvement / Participation Goals	Dept.
Ongoing	Maintain an electronic copy of the SWMP on UC Irvine's Environmental Management Page http://www.ehs.uci.edu/programs/enviro/UCI_SWMP.pdf	EH&S
Ongoing	Maintain an email link on UC Irvine's Environmental Management page to report storm water pollution http://www.ehs.uci.edu/programs/enviro/	EH&S
Ongoing	Continue to convene campus storm water working group	EH&S
Ongoing	Use campus media and publications to promote storm water pollution prevention programs and participation	EH&S

4.03 Illicit Discharge Detection and Elimination

The goal of this minimum control measure is to develop and implement a plan to detect and eliminate non-storm water discharges (illicit discharges) such as process water, wash water, chemical spills, and other non-rain water discharges to the storm drain system. Only clean rainwater should be discharged to the storm drain system.

If an illicit discharge is observed or reported, EH&S staff will document and conduct a field investigation to determine if the source of the discharge can be identified within 72 hours of becoming aware of the suspected illicit discharge. EH&S staff will inspect the storm water conveyance system upstream of the observed discharge to identify the source. The investigation will prioritize potential sanitary sewage and/or significant contributors over suspected discharges of cooling water, wash water, or natural flows.

If the source of the illicit discharge is identified, corrective actions will be implemented to eliminate the discharge. If the source of the illicit discharge cannot be located after investigations upstream of the observed discharge, EH&S staff will notify facilities within the sub-watershed, and recommend best management practices to eliminate illicit discharges.

Illicit discharges that are believed to be an immediate threat to human health or the environment will be reported to the local Health Department. Illicit discharges suspected of being sanitary sewage and/or significantly contaminated will be reported to owners/operators downstream of the discharge location.

The following categories of non-storm drain water discharges or flows will not be considered illicit discharges unless they are determined to be significant contributors of pollutants: ground water, foundation drains, air conditioning condensation, water from crawl space pumps, footing drains, building plumbing flushing's, fire hydrant and discharges or flows from firefighting activities.

MEP Standards

- Develop and maintain a storm sewer system map, showing outfall locations and the names and location of all waters of the United States that receive discharges from those outfalls;
- Through internal policies and procedures, a prohibition (to the extent allowable under State, or local law) on non-storm water discharges into the MS4, and appropriate enforcement procedures and actions;

- Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, into the MS4;
- Inform public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste;
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

Measurable Goals to Meet MEP Requirements

Schedule	Illicit Discharge Detection and Elimination Goals	Dept.
Ongoing	Maintain and update the campus wide SPCC Plan	EH&S
Ongoing	Maintain and update campus facilities storm drain maps	EH&S & FM
Ongoing	Maintain email link to report campus notification system for sewage spills and other non-storm water discharges	EH&S
Ongoing	Investigate sources of suspected illicit discharges and provide approaches to eliminating such discharges	EH&S
Ongoing	Implement UC Irvine's Sanitary Sewer Management Program	SWAC

4.04 Pollution Prevention / Good Housekeeping for Facilities Operation and Maintenance

The goal of this minimum control measure is to prevent or reduce pollutant runoff from facilities operation and maintenance activities. The program will include training of relevant staff in pollution prevention measures and techniques (e.g., regular street sweeping, reduction in the use of pesticides, or frequent catch-basin cleaning).

MEP standards

- Develop and implement a program with the ultimate goal of preventing or reducing pollutant runoff from facilities and maintenance operations into the storm sewer system;
- Provide employee training on how to incorporate pollution prevention/good housekeeping techniques into facilities operation and maintenance such as park and open space maintenance, fleet and building maintenance, and storm water system maintenance. To minimize duplication of effort and conserve resources, the MS4 operator can use training materials that are available from EPA, their State, or relevant organizations;
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

Measurable Goals to Meet MEP Requirements

Schedule	Pollution Prevention/Good Housekeeping (PP/GH) for Facilities Operation and Maintenance Goals	Dept.
Ongoing	Educate appropriate staff on the source control BMPs on UC Irvine's Storm Water Pollution Prevention Program	EH&S
Ongoing	Maintain electronic copy of source control BMPs on UC Irvine's Environmental Management page	EH&S
Ongoing	Conduct annual inspections to determine if the source control BMPs listed in the SWPPP are being implemented in accordance with Industrial Storm Water General Permits	EH&S
Ongoing	Using a street sweeper, clean the streets and parking lots on UC Irvine's main campus on a regular basis	FM & T&DS
Ongoing	Dispose of waste materials extracted from catch basins in a trash dumpster to prevent water and waste materials from reentering the storm drain system	FM
Ongoing	Identify and prioritize storm water pollution prevention projects and conveyance system retrofits and repairs through the Water Resources Working Group and request funding	SWAC
Ongoing	Review source control BMPs on UC Irvine's Environmental Management page on an annual basis and update/revise as needed	SWAC

4.05 Construction Site Storm Water Runoff Control

The goal of this minimum control measure is to develop, implement, and enforce a program for construction activities to control erosion and sediment properly manage site materials and wastes, and prevent dry weather flows.

MEP Standards

- Through management, contracting or other mechanisms, require the implementation of proper erosion and sediment controls on applicable construction sites;
- Establish requirements for construction site operators to control wastes such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary wastes at the construction site that may cause adverse impacts to water quality.
- Establish procedures for site plan review of construction plans that ensure potential water quality impacts are considered;
- Establish procedures for site inspection and enforcement of control measures;
- Establish procedures for the receipt and consideration of information submitted by the public; and
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

Measurable Goals to Meet MEP Requirements

Schedule	Construction Site Storm Water Runoff Control Goals	Dept.
Ongoing	Administer existing contract provisions for enforcement of control measures	EH&S
Ongoing	Implement the public review process for large capital improvement projects pursuant to CEQA requirements	EP&S, D&CS, FM
Ongoing	For construction projects <1 acre, inspect the project site on a regular basis and notify the contractor of an issue is identified	D&CS, FM
Ongoing	For construction project >1 acre, review SWPPPs prior to filing Notice of Intent	D&CS, T&DS, FM, EH&S and authorized representatives
Ongoing	Conduct inspections of SWPPP BMPS for construction projects >1 acre in accordance with the Construction General Permit. Coordinate findings with project contractor and D&CS staff	D&CS, T&DS, FM and authorized representatives
Ongoing	For construction projects >1 acre, review storm water issues with all project affiliated personnel at SWPPP kick-off meetings prior to construction commencement	D&CS, T&DS, FM and authorized representatives

Ongoing	For construction projects >1 acre, a qualified SWPPP Practitioner (WSP) will conduct construction site inspections in accordance with the procedures identified in the current Construction General Permit. This includes: weekly site inspections; rains event action plans; pre-rain, rain, and post-rain event inspections; and maintenance inspections	D&CS, T&DS, FM and authorized representatives
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4.06 Post-construction Storm Water Management in New Development and Redevelopment

The goal for this minimum control measure is to develop, implement, and enforce a program to address discharges of post-construction storm water runoff from new development and redevelopment areas.

Post-construction storm water management controls include permanent structural (e.g., rooftop runoff infiltration galleries) and non-structural BMPs (e.g., conservation of natural and permeable areas) that remain in place after the project is completed and prevent pollution from the new development over time.

Projects subject to the new standards are new development that are > 1 acre in size and redevelopment projects that replace > 1 acre in size (such as redevelopment on a surface parking lot). If the site does not accommodate treatment controls, or the University determines that they are too costly, the equivalent volume of water may be treated at an alternative site.

MEP standards

- Develop and implement strategies which include a combination of structural and/or non-structural BMPs;
- Through management, contracting, or other mechanisms, require the implementation of post-construction runoff controls;
- Ensure adequate long-term operation and maintenance of controls;
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

Measurable Goals to Meet MEP Requirements

Schedule	Construction Site Storm Water Runoff Control Goals	Dept.
Ongoing	Review and update UC Irvine's design standards as needed to ensure the following: <ul style="list-style-type: none"> • Low Impact Development (LID) requirements are evaluated for each project and implemented as appropriate 	EH&S, D&CS, FM, EP&S
Ongoing	Maintain inventory of storm water treatment control BMPs	EH&S and SWAC
Ongoing	Inspect and maintain the LID treatment control BMPs on the inventory in accordance with the maintenance schedule	EH&S and SWAC
Ongoing	Review and evaluate new options/technology for structural and non-structural BMPs	SWAC

5.0 Record Keeping

5.01 SWMP Updating

The SWMP will be reviewed annually and UC Irvine will update the SWMP whenever a change in activities or operations occurs which may significantly affect the discharge of storm water pollutants.

5.02 SWMP Public Access

This SWMP is meant for use by UC Irvine and UC Irvine staff and is a public document. Any request for a copy of the SWMP by the Santa Ana Regional Water Quality Control Board (SARWQCB), other governmental agency, or citizen is to be forwarded to the UC Irvine, Environmental Health & Safety Department, 4600 Health Sciences Road, Irvine, CA 92697-2725.

5.03 SWMP Annual Reports

EH&S will complete and submit annual reports regarding the implementation of the SWMP and measurable goals to the SARWQCB.

6.0 Appendices

6.01 Appendix 1

UC Irvine Information

Central Campus

Location Description

The UC Irvine Campus is situated in Irvine, California, in central Orange County. The facility is generally bounded by State Route 73, Jamboree Rd, Campus Dr, Culver Rd, and Bonita Canyon Road.

Facility Operations

UC Irvine employs licensed operators, skilled trades, grounds, and custodial staff for day-to-day operations. Typical duties include plant operation, building maintenance, plumbing and electrical repairs and grounds maintenance. A few of the buildings use pumps to remain dewatered.

Climate and Rainfall

Meteorological conditions at UC Irvine are influenced by its proximity to the Pacific Ocean. Average annual daily temperatures for Irvine range from 67 degrees Fahrenheit (°F) in the winter, to 86 °F in the summer. Average total precipitation is 13 inches annually, with approximately 84% of the annual rainfall occurring during November through March.

Facility Drainage

UCI receives water from neighboring areas and roads, specifically from Turtle Rock on the eastern edge of campus, and from the residential areas along University Drive.

There are two discharge point sources going from UC Irvine into San Diego Creek along University Drive, and an area source from the Facilities yard and other activities from the “North Campus” area located at the intersection of Jamboree Road and Campus Drive that flows into the marsh and eventually enters San Diego Creek. Runoff from local developments and roads co-mingles with UCI water in along University Drive. These sources drain areas such as streets, parking lots, loading docks, roofs, and other surfaces that receive rainwater. San Diego Creek flows into Newport Bay and then into the Pacific Ocean.

General Watershed Description

The San Diego Creek watershed, includes lands owned by the University of California, lands owned by the City of Irvine, and land owned by private landowners (residences). All of these sources influence the water quality of San Diego Creek.

Local Geology

The San Joaquin Hills area of the region is part of a section of uplifted marine terrace (Tertiary) sediments included in the Peninsular Ranges province of Southern California. Rocks exposed within the area include middle Miocene age marine sedimentary rocks, and intrusive and extrusive igneous rocks. These rocks have been assigned to two members of Topanga formation: the Los Trancos member and the Paularino member. The Los Trancos member can be found in the central and southern portions of the campus, and the Paularino member in the highlands at the southern boundary of the property, extending to the Campus Drive on the north.

Land Use

The developed area in the lower San Diego Creek watershed is dominated by institutional activities. The UC Irvine central campus and residential housing account for most of this area. Buildings, parking lots, small lawn and open areas, as well as roadways and walkways are included in this category. Recreational land uses consist of the Arboretum and Estuary.

On the western portion of the campus, near the facilities yard in “North Campus” there is a former landfill. The landfill was deeded to the University of California as part of the land given when UCI was first created. UCI never operated the landfill, but has maintained the closed site. The County of Orange was the operator of record. There is a General Waste Discharge Requirement R8-2013-0010 covering this area (http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2013/13_010_Gen_WDR_Closed_Abandoned_Inactive_Waste_Landfills.pdf).

Existing Sampling Data

Limited storm water quality sampling was conducted under an earlier NPDES permit, originally obtained to discharge water from the cooling towers on the UC Irvine campus. The discharge was discontinued several years ago, and this NPDES permit is no longer in existence. Water was sampled for Total Dissolved Solids (TDS), flow, suspended solids, oil and grease, pH, toxicity sampling, copper, and chromium. San Diego Creek is listed on the Clean Water Act Section 303(d) list of impaired water bodies and the SARWQCB is establishing Total Maximum Daily Loads (TMDLs) for coliform, metals, pesticides.