Appendix IS-6

Hydrology and Water Resources
Technical Report

HYDROLOGY & WATER RESOURCES TECHNICAL REPORT

for

East End Studio Arts District Campus
Los Angeles, CA

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APPENDIX

1.0 INTRODUCTION

1.1 Project Description

East End Studios Arts District Los Angeles (East End Studios ADLA, the Project) includes the development of a new production studio campus on an approximately 14.6-acre (635,551 square feet) site located at the southeast corner of 6th Street and Alameda Street (Project Site) within the Central City North Community Plan area of the City of Los Angeles (City). The Project would include eight new soundstages with each soundstage containing two studios for a total of 16 studios, eight structures that would be programmed with studio production support uses, four new office buildings, and a publicly accessible parklet (located at the corner of 6th Street and Mill Street). The Project could also provide an area within the footprint of the enclosed mechanical platform along 6th Street that could be used by a potential retailer such as a café. The area for this space would be approximately 1,560 square feet. If this area is not used by a retailer, the area would be used to accommodate additional bicycle parking. The Project would comprise a total floor area of 674,175 square feet, including a potential café, with a floor area ratio (FAR) of 1.06:1. A total of 1,317 vehicular parking spaces would be provided for the proposed uses within one level of below grade parking, surface parking, and within a five-story parking structure. The existing two warehouse structures consisting of approximately 311,000 square feet would be demolished as part of the Project.

1.2 Scope of Work

This technical study provides a description of the existing surface water hydrology, surface water quality, groundwater level and quality at the Project Site. It analyzes the Project's potential impacts related to surface water hydrology, surface water quality and groundwater quality.

2.0 REGULATORY FRAMEWORK

2.1 Surface Water Hydrology

Los Angeles County Hydrology Manual

The L.A. County Hydrology Manual requires that storm drain conveyance systems be designed for a 25-year storm event and that the combined capacity of the storm drain and street flow system have capacity for flow from a 50-year storm event.

The County also limits the allowable storm flow into existing storm drain facilities based on the municipal separate storm sewer systems (MS4) Permit which is applicable to all new developments that discharge directly into the County's storm drain system. Any proposed drainage improvements of County owned storm drain facilities such as catch basins and storm drain lines require approval and review from the County Flood Control District.

Los Angeles Municipal Code

Any proposed drainage improvement within the right-of-way or any other property owned or under the control of the City requires the approval of a B-permit (Section 62.105, Los Angeles Municipal Code (LAMC)). Under the B-permit process, storm drain installation plans are subject to review and approval by the City of Los Angeles Department of Public Works, Bureau of Engineering. Additionally, any connections to the City's storm drain system from a private property to a City catch basin or an underground storm drain pipe requires a storm drain connection permit from the City of Los Angeles Department of Public Works, Bureau of Engineering.

2.2 Surface Water Quality

Clean Water Act

The Clean Water Act authorizes Federal, state, and local entities to cooperatively create comprehensive programs for eliminating or reducing the pollution of state waters and tributaries. The primary goals of the Clean Water Act are to restore and maintain the chemical, physical, and biological integrity of the nation's waters and to make all surface waters fishable and swimmable. As such, the Clean Water Act forms the basic national framework for the management of water quality and the control of pollutant discharges. The Clean Water Act also sets forth a number of objectives in order to achieve the above-mentioned goals. These objectives include regulating pollutant and toxic pollutant discharges; providing for water quality that protects and fosters the propagation of fish, shellfish and wildlife; developing waste treatment management plans; and developing and implementing programs for the control of non-point sources of pollution.

Since its introduction, major amendments to the Clean Water Act have been enacted (e.g., 1961, 1966, 1970, 1972, 1977, and 1987). Amendments enacted in 1970 created the U.S. Environmental Protection Agency (USEPA), while amendments enacted in 1972 deemed the discharge of pollutants into waters of the United States from any point source unlawful unless authorized by a USEPA National Pollutant Discharge Elimination System (NPDES) permit. Amendments enacted in 1977 mandated development of a "Best Management Practices" Program at the state level and provided the Water Pollution Control Act with the common name of "Clean Water Act," which is universally used today. Amendments enacted in 1987 required the USEPA to create specific requirements for discharges. In response to the 1987 amendments to the Clean Water Act and as part of Phase I of its NPDES permit program, the USEPA began requiring NPDES permits for: (1) municipal separate storm sewer systems (MS4) generally serving, or located in, incorporated cities with 100,000 or more people (referred to as municipal permits); (2) 11 specific categories of industrial activity (including landfills); and (3) construction activity that disturbs five acres or more of land. Phase II of the USEPA's NPDES permit program, which went into effect in early 2003, extended the requirements for NPDES permits to: (1) numerous small municipal separate storm sewer systems, (2) construction sites of one to five acres, and (3) industrial facilities owned or operated by small municipal separate storm sewer systems. The NPDES permit program is typically administered by individual authorized states.

In 2008, the USEPA published draft Effluent Limitation Guidelines (ELGs) for the construction and development industry. On December 1, 2009 the EPA finalized its 2008 Effluent Guidelines Program Plan. In California, the NPDES stormwater permitting program is administered by the State Water Resources Control Board (SWRCB). The SWRCB was created by the Legislature in 1967. The joint authority of water distribution and water quality protection allows the Board to provide protection for the State's waters, through its nine Regional Water Quality Control Boards (RWQCBs). The RWQCBs develop and enforce water quality objectives and implement plans that will best protect California's waters, acknowledging areas of different climate, topography, geology, and hydrology. The RWQCBs develop "basin plans" for their hydrologic areas, issue waste discharge requirements, enforce action against stormwater discharge violators, and monitor water quality.

Federal Anti-Degradation Policy

The Federal Anti-degradation Policy (40 Code of Federal Regulations 131.12) requires states to develop statewide anti-degradation policies and identify methods for implementing them. Pursuant to the Code of Federal Regulations (CFR), state anti-degradation policies and implementation methods shall, at a minimum, protect and maintain (1) existing in-stream water uses; (2) existing water quality, where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the state finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding national resource.

California Porter-Cologne Act

The Porter-Cologne Water Quality Control Act established the legal and regulatory framework for California's water quality control. The California Water Code authorizes the SWRCB to implement the provisions of the CWA, including the authority to regulate waste disposal and require cleanup of discharges of hazardous materials and other pollutants.

Under the California Water Code (CWC), the State of California is divided into nine RWQCBs, governing the implementation and enforcement of the CWC and CWA. The Project Site is located within Region 4, also known as the Los Angeles Region. Each RWQCB is required to formulate and adopt a Basin Plan for its region. This Plan must adhere to the policies set forth in the CWC and established by the SWRCB. The RWQCB is also given authority to include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

California Anti-Degradation Policy

The California Anti-degradation Policy, otherwise known as the Statement of Policy with Respect to Maintaining High Quality Water in California was adopted by the SWRCB (State Board Resolution No. 68-16) in 1968. Unlike the Federal Anti-degradation Policy, the California Anti-degradation Policy applies to all waters of the State, not just surface waters. The policy states that whenever the existing quality of a water body is better than the quality established in individual Basin Plans, such high quality shall be maintained and discharges to that water body shall not unreasonably affect present or anticipated beneficial use of such water resource.

California Toxic Rule

In 2000, the EPA promulgated the California Toxic Rule, which establishes water quality criteria for certain toxic substances to be applied to waters in the State. The EPA promulgated this rule based on the EPA's determination that the numeric criteria are necessary in the State to protect human health and the environment. The California Toxic Rule establishes acute (i.e., short-term) and chronic (i.e., long-term) standards for bodies of water such as inland surface waters and enclosed bays and estuaries that are designated by the Los Angeles RWQCB (LARWQCB) as having beneficial uses protective of aquatic life or human health.

Board Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties

As required by the California Water Code, the LARWQCB has adopted a plan entitled "Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal watersheds of Los Angeles and Ventura Counties" (Basin Plan). Specifically, the Basin Plan designates beneficial uses for surface and groundwaters, sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy, and describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Those of other agencies are referenced in appropriate sections throughout the Basin Plan.

The Basin Plan is a resource for the LARWQCB and others who use water and/or discharge wastewater in the Los Angeles Region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

NPDES Permit Program

The NPDES permit program was first established under authority of the CWA to control the discharge of pollutants from any point source into the waters of the United States. As indicated above, in California, the NPDES stormwater permitting program is administered by the SWRCB through its nine RWQCBs.

The General Permit

SWRCB Order No. 2012-0006-DWQ known as "The General Permit" was adopted on July 17, 2012. This NPDES permit establishes a risk-based approach to stormwater control requirements for construction Projects by identifying three Project risk levels. The main objectives of the General Permit are to:

1. Reduce erosion;

2. Minimize or eliminate sediment in stormwater discharges;

3. Prevent materials used at a construction site from contacting stormwater;

4. Implement a sampling and analysis program;

5. Eliminate unauthorized non-stormwater discharges from construction sites;

6. Implement appropriate measures to reduce potential impacts on waterways both during and after construction of Projects; and

7. Establish maintenance commitments on post-construction pollution control measures.

California mandates all construction activities disturbing more than one acre of land to develop and implement Stormwater Pollution Prevention Plans (SWPPP). The SWPPP documents the selection and implementation of Best Management Practices (BMPs) for a specific construction Project, charging owners with stormwater quality management responsibilities. A construction site subject to the General Permit must prepare and implement a SWPPP that meets the requirements of the General Permit.

Los Angeles County Municipal Storm Water System (MS4) Permit

As described above, USEPA regulations require that MS4 permittees implement a program to monitor and control pollutants being discharged to the municipal system from both industrial and commercial Projects that contribute a substantial pollutant load to the MS4. On November 8, 2012, the LARWQCB adopted Order No. R4-2012-0175 under the CWA and the Porter-Cologne Act. This Order is the NPDES permit or MS4 permit for municipal stormwater and urban runoff discharges within Los Angeles County. The requirements of this Order (the "Permit") cover 84 cities and most of the unincorporated areas of Los Angeles County. Under the Permit, the Los Angeles County Flood Control District (LACFCD) is designated as the Principal Permittee. The Permittees are the 84 Los Angeles County cities (including the City of Los Angeles) and Los Angeles County. Collectively, these are the "Co-Permittees". The Principal Permittee helps to facilitate activities necessary to comply with the requirements outlined in the Permit but is not responsible for ensuring compliance of any of the Permittees.

Stormwater Quality Management Program (SQMP)

In compliance with the Permit, the Co-Permittees are required to implement a stormwater quality management program (SQMP) with the goal of accomplishing the requirements of the Permit and reducing the amount of pollutants in stormwater runoff. The SWMP requires the County of Los Angeles and the 84 incorporated cities to:

- Implement a public information and participation program to conduct outreach on storm water pollution;

- Control discharges at commercial/industrial facilities through tracking, inspecting, and ensuring compliance at facilities that are critical sources of pollutants;

- Implement a development planning program for specified development Projects;

- Implement a program to control construction runoff from construction activity at all construction sites within the relevant jurisdictions;

- Implement a public agency activities program to minimize storm water pollution impacts from public agency activities; and

- Implement a program to document, track, and report illicit connections and discharges to the storm drain system.

The Permit contains the following provisions for implementation of the SQMP by the Co-Permittees:

1. General Requirements:

    - Each permittee is required to implement the SQMP in order to comply with applicable stormwater program requirements.

    - The SQMP shall be implemented and each permittee shall implement additional controls so that discharge of pollutants is reduced.

2. Best Management Practice Implementation:
    - Permittees are required to implement the most effective combination of BMPs for stormwater/urban runoff pollution control. This should result in the reduction of storm water runoff.

3. Revision of the SQMP:

    - Permittees are required to revise the SQMP in order to comply with requirements of the RWQCB while complying with regional watershed requirements and/or waste load allocations for implementation of Total Maximum Daily Loads (TMDLs) for impaired waterbodies.

4. Designation and Responsibilities of the Principal Permittee:

The Los Angeles County Flood Control District is designated as the Principal Permittee who is responsible for:

- Coordinating activities that comply with requirements outlined in the NPDES Permit;

- Coordinating activities among Permittees;

- Providing personnel and fiscal resources for necessary updates to the SQMP;

- Providing technical support for committees required to implement the SQMP; and

- Implementing the Countywide Monitoring Program required under this Order and assessing the results of the monitoring program.

5. Responsibilities of Co-Permittees:
Each Co-Permittee is required to comply with the requirements of the SQMP as applicable to the discharges within its geographical boundaries. These requirements include:

- Coordinating among internal departments to facilitate the implementation of the SQMP requirements in an efficient way;

- Participating in coordination with other internal agencies as necessary to successfully implement the requirements of the SQMP; and

- Preparing an annual Budget Summary of expenditures for the storm water management program by providing an estimated breakdown of expenditures for different areas of concern, including budget Projections for the following year.

6. Watershed Management Committees (WMCs):

- Each WMC shall be comprised of a voting representative from each Permittee in the Watershed Management Area (WMA).
- Each WMC is required to facilitate exchange of information between co-permittees, establish goals and deadlines for WMAs, prioritize pollution control measures, develop and update adequate information, and recommend appropriate revisions to the SQMP.

7. Legal Authority:

- Co-Permittees are granted the legal authority to prohibit non-storm water discharges to the storm drain system including discharge to the MS4 from various development types.

<u>City of Los Angeles Water Quality Compliance Master Plan for Urban Runoff</u>
On March 2, 2007, City Council Motion 07-0663 was introduced by the City of Los Angeles City Council to develop a water quality master plan with strategic directions for planning, budgeting and funding to reduce pollution from urban runoff in the City of Los Angeles. The Water Quality Compliance Master Plan for Urban Runoff was developed by the Bureau of Sanitation, Watershed Protection Division in collaboration with stakeholders to address the requirements of this Council Motion. The primary goal of the Water Quality Compliance Master Plan for Urban Runoff is to help meet water quality regulations. Implementation of the Water Quality Compliance Master Plan for Urban Runoff is intended over the next 20 to 30 years to result in cleaner neighborhoods, rivers, lakes and bays, augmented local water supply, reduced flood risk, more open space, and beaches that are safe for swimming. The Water Quality Compliance Master Plan for Urban Runoff also supports the Mayor and Council's efforts to make Los Angeles the greenest major city in the nation.

- The Water Quality Compliance Master Plan for Urban Runoff identifies and describes the various watersheds in the City, summarizes the water quality conditions of the City's waters, identifies known sources of pollutants, describes the governing regulations for water quality, describes the BMPs that are being implemented by the City, discusses existing TMDL Implementation Plans and Watershed Management Plans. Additionally, the Water Quality Compliance Master Plan for Urban Runoff provides an implementation strategy that includes the following three initiatives to achieve water quality goals:

- Water Quality Management Initiative, which describes how Water Quality Management Plans for each of the City's watershed and TMDL-specific Implementation Plans will be developed to ensure compliance with water quality regulations.

- The Citywide Collaboration Initiative, which recognizes that urban runoff management and urban (re)development are closely linked, requiring collaborations of many City agencies. This initiative requires the development of City policies, guidelines, and ordinances for green and sustainable approaches for urban runoff management.

- The Outreach Initiative, which promotes public education and community engagement with a focus on preventing urban runoff pollution.

- The Water Quality Compliance Master Plan for Urban Runoff includes a financial plan that provides a review of current sources of revenue, estimates costs for water quality compliance, and identifies new potential sources of revenue.

City of Los Angeles Stormwater Program

The City of Los Angeles supports the policies of the General Permit and the Los Angeles County NPDES permit through the Development Best Management Practices Handbook. Part A Construction Activities, 3rd Edition, and associated ordinances were adopted in September 2004. Part B Planning Activities, 4th Edition was adopted in June 2011. The Handbook provides guidance for developers in complying with the requirements of the Development Planning Program regulations of the City's Stormwater Program. Compliance with the requirements of this manual is required by City of Los Angeles Ordinance No. 173,494. The handbook and ordinances also have specific minimum BMP requirements for all construction activities and require dischargers whose construction Projects disturb one acre or more of soil to prepare a SWPPP and file a Notice of Intent (NOI) with the SWRCB. The NOI informs the SWRCB of a particular Project and results in the issuance of a Waste Discharger Identification (WDID) number, which is needed to demonstrate compliance with the General Permit. The City of Los Angeles implements the requirement to incorporate stormwater BMPs through the City's plan review and approval process. During the review process, Project plans are reviewed for compliance with the City's General Plan, zoning ordinances, and other applicable local ordinances and codes, including storm water requirements. Plans

and specifications are reviewed to ensure that the appropriate BMPs are incorporated to address storm water pollution prevention goals. The Standard Urban Stormwater Mitigation Plan (SUSMP) provisions that are applicable to new residential and commercial developments include, but are not limited to, the following:

- Peak Storm Water Runoff Discharge Rate: Post-development peak stormwater runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion;

- Provide storm drain system Stenciling and Signage (only applicable if a catch basin is built on-site);

- Properly design outdoor material storage areas to provide secondary containment to prevent spills;

- Properly design trash storage areas to prevent off-site transport of trash;

- Provide proof of ongoing BMP Maintenance of any structural BMPs installed;

Design Standards for Structural or Treatment Control BMPs:

- Conserve natural and landscaped areas;

- Provide planter boxes and/or landscaped areas in yard/courtyard spaces;

- Properly design trash storage areas to provide screens or walls to prevent off-site transport of trash;

- Provide proof on ongoing BMP maintenance of any structural BMPs installed;

Design Standards for Structural or Treatment Control BMPs:

- Post-construction treatment control BMPs are required to incorporate, at minimum, either a volumetric or flow based treatment control design or both, to mitigate (infiltrate, filter or treat) storm water runoff.

  In addition, Project applicants subject to the SUSMP requirements must select source control and, in most cases, treatment control BMPs from the list approved by the RWQCB. The BMPs must control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency. Further, the source and treatment control BMPs must be sufficiently designed and constructed to collectively treat, infiltrate, or filter stormwater runoff from one of the following:

- The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998);

- The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook—Industrial/ Commercial, (1993);

- The volume of runoff produced from a 0.75-inch storm event, prior to its discharge to a stormwater conveyance system; or

- The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75-inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

Los Angeles Municipal Code

Section 64.70 of the LAMC sets forth the City's Stormwater and Urban Runoff Pollution Control Ordinance. The ordinance prohibits the discharge of the following into any storm drain system:

- Any liquids, solids, or gases which by reason of their nature or quantity are flammable, reactive, explosive, corrosive, or radioactive, or by interaction with other materials could result in fire, explosion or injury.
- Any solid or viscous materials, which could cause obstruction to the flow or operation of the storm drain system.
- Any pollutant that injures or constitutes a hazard to human, animal, plant, or fish life, or creates a public nuisance.
- Any noxious or malodorous liquid, gas, or solid in sufficient quantity, either singly or by interaction with other materials, which creates a public nuisance, hazard to life, or inhibits authorized entry of any person into the storm drain system.
- Any medical, infectious, toxic or hazardous material or waste.

Additionally, unless otherwise permitted by a NPDES permit, the ordinance prohibits industrial and commercial developments from discharging untreated wastewater or untreated runoff into the storm drain system. Furthermore, the ordinance prohibits trash or any other abandoned objects/materials from being deposited such that they could be carried into the storm drains. Lastly, the ordinance not only makes it a crime to discharge pollutants into the storm drain system and imposes fines on violators, but also gives City public officers the authority to issue citations or arrest business owners or residents who deliberately and knowingly dump or discharge hazardous chemicals or debris into the storm drain system.

Earthwork activities, including grading, are governed by the Los Angeles Building Code, which is contained in LAMC, Chapter IX, Article 1. Specifically, Section 91.7013 includes

regulations pertaining to erosion control and drainage devices, and Section 91.7014 includes general construction requirements, as well as requirements regarding flood and mudflow protection.

Low Impact Development (LID)

In October 2011, the City of Los Angeles passed an ordinance (Ordinance No. 181899) amending LAMC Chapter VI, Article 4.4, Sections 64.70.01 and 64.72 to expand the applicability of the existing SUSMP requirements by imposing rainwater Low Impact Development (LID) strategies on Projects that require building permits. The LID ordinance became effective on May 12, 2012. LID is a stormwater management strategy with goals to mitigate the impacts of increased runoff and stormwater pollution as close to its source as possible. LID promotes the use of natural infiltration systems, evapotranspiration, and the reuse of stormwater. The goal of these LID practices is to remove nutrients, bacteria, and metals from stormwater while also reducing the quantity and intensity of stormwater flows. Through the use of various infiltration strategies, LID is aimed at minimizing impervious surface area. Where infiltration is not feasible, the use of bioretention, rain gardens, green roofs, and rain barrels that will store, evaporate, detain, and/or treat runoff may be used.

The intent of the City of Los Angeles LID standards is to:

- Require the use of LID practices in future developments and redevelopments to encourage the beneficial use of rainwater and urban runoff;
- Reduce stormwater/urban runoff while improving water quality;
- Promote rainwater harvesting;
- Reduce offsite runoff and provide increased groundwater recharge;
- Reduce erosion and hydrologic impacts downstream; and
- Enhance the recreational and aesthetic values in our communities.

The City of Los Angeles Bureau of Sanitation, Watershed Protection Division will adopt the LID standards as issued by the LARWQCB and the City of Los Angeles Department of Public Works. The LID Ordinance will conform to the regulations outlined in the NPDES Permit and SUSMP.

2.3 Ground Water

Board Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties

As required by the California Water Code, the LARWQCB has adopted the Basin Plan. Specifically, the Basin Plan designates beneficial uses for surface and ground waters,

sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy, and describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Those of other agencies are referenced in appropriate sections throughout the Basin Plan.

The Basin Plan is a resource for the Regional Board and others who use water and/or discharge wastewater in the Los Angeles Region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

Safe Drinking Water Act (SDWA)
The Federal Safe Drinking Act, established in 1974, sets drinking water standards throughout the country and is administered by the USEPA. The drinking water standards established in the SDWA, as set forth in the Code of Federal Regulations (CFR), are referred to as the National Primary Drinking Water Regulations (Primary Standards, Title 40, CFR Part 141) and the National Secondary Drinking Water Regulations (Second Standards, 40 CFR Part 143). California passed its own Safe Drinking Water Act in 1986 that authorizes the State's Department of Health Services (DHS) to protect the public from contaminants in drinking water by establishing maximum contaminants levels (MCLs), as set forth in the CCR, Title 22, Division 4, Chapter 15, that are at least as stringent as those developed by the USEPA, as required by the federal Safe Drinking Water Act.

California Water Plan
The California Water Plan (the Plan) provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Plan, which is updated every five years, presents basic data and information on California's water resources including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The Plan also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and Projects to address the State's water needs.

The goal for the California Water Plan Update is to meet Water Code requirements, receive broad support among those participating in California's water planning, and be a useful document for the public, water planners throughout the state, legislators and other decision-makers.

3.0 ENVIRONMENTAL SETTING

3.1 Surface Water Hydrology

The Project Site is located within downtown Los Angeles within Los Angeles County, bounded by Alameda St on the west, East 6th St on the north, and Mill St on the east.

The site is within the Los Angeles River Watershed in the Los Angeles Central Basin. Refer to Figure 1 for the site location within the Los Angeles River Watershed Map.

The streets surrounding the Project Site contain existing catch basins and underground storm drain pipes. The existing site has two points of connection on the northwest and the southeast corners. On the northwest side, a 21" RCP storm pipe running parallel to Alameda Blvd connects the west end of the site to a 97" brick storm pipe running along 6th Street. On the southeast corner, a 16" A.C. storm pipe routes to Mill Street where it connects to a 16" VCP storm pipe.

The existing site contains two commercial and industrial buildings each surrounded by trailer and associate parking. A system of catch basins and storm drain pipes run around the buildings to the point of connections. The site is split into three areas. The northern area contains a series of catch basins and storm drain pipes that connect to the East 6th Street point of connection. The central area between the two buildings contains a valley gutter with catch basins and storm drain pipes running from east to south connecting to East 6th Street. The southern area of the site contains a series of catch basins and storm drain pipes that connect to the Mill Street point of connection. See Figure 2 for existing on-site drainage pattern and Figure 4 for hydrology calculations.

Table 1 below shows existing volumetric flow rate generated by the 50-year storm event.

Table 1. Existing Drainage Stormwater 50-Year Volume

Drainage Area	**Area (Acres)**	**Q_{50} (cfs)**
1A (drains to East 6th St)	3.12	6.82
1B (drains to East 6th St)	6.53	13.20
2 (drains to Mill St)	4.96	10.85
TOTAL	14.61	30.87

3.2 Surface Water Quality

The Project runoff leads into the Los Angeles River Reach 2. Constituents of concern listed for Los Angeles River Reach 2 under California's Clean Water Act Section 303(d) List includes trash, nutrients (algae), ammonia, indicator bacteria, oil, copper, and lead. Listed pollutants with TMDL include trash, nutrients (algae), ammonia, indicator bacteria, copper, and lead. Urban stormwater runoff occurs following precipitation events, with the volume of runoff flowing into the drainage system depending on the intensity and duration of the rain event. Contaminants such as sediments, trash, bacteria, metals, nutrients, organics and pesticides from the surface and air may be carried by rainfall runoff into drainage systems. Therefore, the City of Los Angeles has put in place catch basins with screens to capture debris before entering the storm drain system.

The current site has been developed primarily for commercial and industrial use. Based on the existing buildings, site conditions, and surrounding area, it is assumed the site currently does not implement Best Management Practices (BMPs). The existing site

captures all runoff within existing catch basins and drains through storm drain pipes to the northeast and southwest point of connections. The runoff water does not get treated on site before discharging to the main storm drain facility. See Figure 2 for the existing drainage exhibit.

3.3 Ground Water Hydrology

The existing site is located within the northeastern portion of the Central Basin groundwater basin. Based on field investigations conducted by Langan Engineering, groundwater was not encountered to a depth of 51.5 feet and the historical high groundwater was reported at a depth of 150 feet based on previous field investigations performed by others. The entire site is impervious, consisting entirely of existing buildings and paved surfaces. Given the perviousness of the site and the existing drainage patterns, the existing site does not have any significant impact to ground water. See Figure 5 for the site location within the Central Basin.

3.4 Ground Water Quality

The existing site falls under the jurisdiction of the Los Angeles Regional Water Quality Control Board (LARWQCB). Based upon LARWQCB's Basin Plan, constituents of concern listed for the Central Basin include boron, chloride, sulfate, and Total Dissolved Solids (TDS). With existing buildings and paved areas, the existing site is 100% impervious. Given the imperviousness, the depth of existing groundwater, and the existing flow direction, it is unlikely that the site contributes significantly to groundwater recharge. The site does not significantly contribute to groundwater pollution or otherwise significantly adversely impact groundwater quality.

4.0 SIGNIFICANCE THRESHOLDS

4.1 Surface Water Hydrology

Appendix G of the State of California's CEQA Guidelines provides a set of sample questions that address impacts with regard to surface water hydrology. These questions are as follows:

Would the Project:

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    - Result in a substantial erosion or siltation on- or off-site;
    - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

- Impede or redirect flood flows?

In the context of these questions from Appendix G of the CEQA Guidelines, the City of Los Angeles CEQA Thresholds Guide (L.A. CEQA Thresholds Guide) states that a Project would normally have a significant impact on surface water hydrology if it would:

- Cause flooding during the Projected 50-year developed storm event, which would have the potential to harm people or damage property or sensitive biological resources;

- Substantially reduce or increase the amount of surface water in a water body; or

- Result in a permanent, adverse change to the movement of surface water sufficient to produce a substantial change in the current or direction of water flow.

4.2 Surface Water Quality

Appendix G of the CEQA Guidelines provides a set of sample questions that address impacts with regard to surface water quality. These questions are as follows:

Would the Project:

- Violate any water quality standard or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

In the context of the above questions from Appendix G, the L.A. CEQA Thresholds Guide states that a Project would normally have a significant impact on surface water quality if it would result in discharges that would create pollution, contamination or nuisance, as defined in Section 13050 of the California Water Code (CWC) or that cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan for the receiving water body.

The CWC includes the following definitions:

- "Pollution" means an alteration of the quality of the waters of the state to a degree which unreasonably affects either of the following: 1) the waters for beneficial uses or 2) facilities which serve these beneficial uses. "Pollution" may include "Contamination".

- "Contamination" means an impairment of the quality of the waters of the state by waste to a degree, which creates a hazard to the public health through poisoning or though the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

- "Nuisance" means anything which meets all of the following requirements: 1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; 2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and 3) occurs during, or as a result of, the treatment or disposal of wastes.

4.3 Ground Water Hydrology

Appendix G of the CEQA Guidelines provides a sample question that addresses impacts with regard to groundwater. This question is as follows:

Would the Project:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;

- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

In the context of the above question from Appendix G, the *L.A. CEQA Thresholds Guide* states that a Project would normally have a significant impact on groundwater if it would:

- Change potable water levels sufficiently to:

    - Reduce the ability of a water utility to use the groundwater basin for public water supplies, conjunctive use purposes, storage of imported water, summer/winter peaking, or to respond to emergencies and drought;

    - Reduce yields of adjacent wells or well fields (public or private); or

    - Adversely change the rate or direction of flow of groundwater; or

- Result in demonstrable and sustained reduction of groundwater recharge capacity.

4.4 Ground Water Quality

With respect to groundwater quality, and in the context of the above question from Appendix G pertaining to groundwater, the L.A. CEQA Thresholds Guide states that a Project would normally have a significant impact on groundwater quality if it would:

- Affect the rate or change the direction of movement of existing contaminants;
- Expand the area affected by contaminants;
- Result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion); or
- Cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations (CCR), Title 22, Division 4, and Chapter 15 and in the Safe Drinking Water Act.

5.0 METHODOLOGY

5.1 Surface Water Hydrology

The Project Site is located within the City of Los Angeles. All drainage collection, treatment and conveyance are regulated by the City. Per the City's Special Order No. 007-1299, December 3, 1999, the City has adopted the Los Angeles County Department of Public Works (LACDPW) Hydrology Manual as its basis of design for storm drainage facilities. The LACDPW Hydrology Manual requires Projects to have drainage facilities that meet the Urban Flood level of protection. The Urban Flood is runoff from a 25-year frequency design storm falling on a saturated watershed. A 25-year frequency design storm has a probability of 1/25 of being equaled or exceeded in any year. The L.A. CEQA Thresholds Guide, however, establishes the 50-year frequency design storm event as the threshold to analyze potential impacts on surface water hydrology as a result of development. To provide a more conservative analysis, this report analyzes the larger storm event threshold, i.e., the 50-year frequency design storm event.

The Modified Rational Method was used to calculate storm water runoff. The "peak" (maximum value) runoff for a drainage area is calculated using the formula, **Q = CIA**

Where,
Q = Volumetric flow rate (cfs)
C = Runoff coefficient (dimensionless)
I = Rainfall Intensity at a given point in time (in/hr)
A = Basin area (acres)

The Modified Rational Method assumes that a steady, uniform rainfall rate will produce maximum runoff when all parts of the basin area are contributing to outflow. This occurs when the storm event lasts longer than the time of concentration. The time of concentration (Tc) is the time it takes for rain in the most hydrologically remote part of the basin area to reach the outlet.

The method assumes that the runoff coefficient (C) remains constant during a storm. The runoff coefficient is a function of both the soil characteristics and the percentage of impervious surfaces in the drainage area.

LACDPW has developed a time of concentration calculator, Hydrocalc, to automate time of concentration calculations as well as the peak runoff rates and volumes using the Modified Rational Method design criteria as outlined in the Hydrology Manual. The data input requirements include: sub-area size, soil type, land use, flow path length, flow path slope and rainfall isohyet. The Hydrocalc Calculator was used to calculate the storm water peak runoff flow rate for the Project conditions by evaluating an individual sub-area independent of all adjacent subareas. See Figure 4 for the Hydrocalc Calculator results and Figure 7 for the Isohyet Map.

5.2 Surface Water Quality

Construction BMPs will be designed and maintained as part of the implementation of the SWPPP in compliance with the General Permit. The SWPPP shall begin when construction commences, before any site clearing and grubbing or demolition activity. During construction, the SWPPP will be referred to regularly and amended as changes occur throughout the construction process. The Notice of Intent (NOI), Amendments to the SWPPP, Annual Reports, Rain Event Action Plans (REAPs), and Non-Compliance Reporting will be posted to the State's SMARTS website in compliance with the requirements of the General Permit.

The Project will meet the requirements of the City's LID standards. Under section 3.1.3. of the LID Manual, post-construction stormwater runoff from a new development must be infiltrated, evapotranspirated, captured and used, and/or treated through high efficiency BMPs onsite for at least the volume of water produced by the greater of the 85th percentile storm or the 0.75 inch storm event. The LID Manual prioritized the selection of BMPs used to comply with stormwater mitigation requirement. The order of priority is:

1. Infiltration Systems
2. Stormwater Capture and Use
3. High Efficient Biofiltration/Bioretention Systems
4. Combination of Any of the Above

Feasibility screening delineated in the LID manual is applied to determine which BMP will best suit the Project. Specifically, LID guidelines require that infiltration

systems maintain at least 10 feet of clearance to the groundwater, property line, and any building structure.

Per the Project Geotechinical Report prepared by Langan Engineering, groundwater was not encountered during their field investigation up to 51.5-ft below ground surface. The historic high groundwater level is at least 150 feet below the ground surface based on previous field investigations performed by others. According to the Geotechnical Report, a percolation rate of 11.6 in/hr resulted from their field testing, allowing infiltration to be feasible. A design infiltration rate of 3.87 in/hr will be used, factoring in the County of LA minimum safety factor or 3.

Based on the site layout, depth to groundwater, property lines, the Project is able to utilize a series of pre-treatment devices, storage chambers, and drywells to infiltrate the stormwater quality design volume. See Figure 6 for LID calculations.
According to the City's LID Handbook, all infiltration facilities shall be sized to capture and infiltrate the design capture volume (V_{design}) of water produced by the stormwater quality design storm event as determined in section 3.2.2

$$V_{design}(cu\ ft) = 0.0625(ft)\ x\ Catchment\ Area\ (sq\ ft)$$

or

$$V_{design}(cu\ ft) = depth\ of\ from\ 85^{th}\ percentile(ft)\ x\ Catchment\ Area\ (sq\ ft)$$

Where:

$$\text{Catchment Area} = (\text{impervious Area x } 0.9) + [(\text{Pervious Area} + \text{Undeveloped Area}) \text{ x } 0.1]$$

For catchment areas given in acres, multiply the above equation by 43,560 sq. ft./acre.

5.3 Ground Water

The significance of this Project as it relates to the level of the underlying groundwater table of the Central Basin Groundwater Basin included a review of the following considerations:

Analysis and Description of the Project's Existing Condition

- Identification of the Central Basin as the underlying groundwater basin, and description of the level, quality, direction of flow, and existing uses for the water;

- Description of the location, existing uses, production capacity, quality, and other pertinent data for spreading grounds and potable water wells in the vicinity (usually within a one-mile radius), and;

- Area and degree of permeability of soils on the Project Site, and;

Analysis of the Proposed Project Impact on Groundwater Level

- Description of the rate, duration, location and quantity of extraction, dewatering, spreading, injection, or other activities;

- The Projected reduction in groundwater resources and any existing wells in the
- vicinity (usually within a one-mile radius); and

- The Projected change in local or regional groundwater flow patterns.

In addition, this report discusses the impact of both existing and proposed activities at the Project Site on the groundwater quality of the underlying Central Basin.

Short-term groundwater quality impacts could potentially occur during construction of the Project as a result of soil or shallow groundwater being exposed to construction materials, wastes, and spilled materials. These potential impacts are qualitatively assessed.

6.0 PROJECT IMPACT ANALYSIS

6.1 Construction

6.1.1 Surface Water Hydrology

Applicant intends to demolish the Existing Structures and develop the Property with a state-of-the-art production studio campus. The campus will be comprised of 8 new soundstage structures containing 16 state-of-the-art soundstage-production studios (2 studios per soundstage structure) with three-story support use structures attached to each studio structure (a total of 8 attached support use structures), 4 new office structures, a five-story parking garage with one subterranean level, and some surface parking and loading areas (the "Project").

Construction activities for the Project include demolition of two existing buildings on site, site clearing and excavating down approximately 11-ft below grade for the proposed subterranean garage level and 60-ft for the proposed drywells.

It is anticipated that approximately 105,000 cubic yards of soil would need to be exported as a result of the Project. These activities will temporarily expose the underlying soils and may make the Project Site temporarily more permeable. Also, exposed and stockpiled soils could be subject to wind and conveyance into

nearby storm drains during storm events. In addition, on-site watering activities to reduce airborne dust could contribute to pollutant loading in runoff.

However, as the construction site would be greater than one acre, the Project would be required to obtain coverage under the NPDES General Construction stormwater permit. In accordance with the requirements of this permit, the Project would implement a SWPPP that specifies BMPs and erosion control measures to be used during construction to manage runoff flows and prevent pollution. BMPs would be designed to reduce runoff and pollutant levels in runoff during construction. The NPDES and SWPPP measures are designed to (and would in fact) contain and treat, as necessary, stormwater or construction watering on the Project Site so runoff does not impact off-site drainage facilities or receiving waters. Construction activities are temporary and flow directions and runoff volumes during construction will be controlled.

In addition, the Project will comply with all applicable City grading permit regulations, plans, and inspections to reduce sedimentation and erosion. Thus, through compliance with NPDES General Construction Permit requirements, implementation of BMPs, and compliance with applicable City grading regulations, the Project would not substantially alter the Project Site drainage patterns in a manner that would result in substantial erosion or siltation. The Project would not result in a permanent adverse change to the movement of surface water. Therefore, construction-related impacts to surface water hydrology would be less than significant.

6.1.2 Surface Water Quality

Construction activities such as earth moving, maintenance of construction equipment, handling of construction materials, and dewatering, can contribute to pollutant loading in stormwater runoff.

However, construction contractors disturbing greater than on acre of soil would be required to obtain coverage under the NPDES General Construction

Permit (order No. 2012-0006-DWQ). In accordance with the requirements of the permit, the Project Applicants would prepare and implement a site-specific SWPPP adhering to the California Stormwater Quality Association (CASQA) BMP Handbook. The SWPPP would specify BMPs to be used during construction. BMPs would include but not be limited to: erosion control, sediment control, non-stormwater management, and materials management BMPs. Refer to Figure 8 for typical SWPPP BMPs to be implemented during construction of the Project.

With implementation of the Erosion Control Plan, site-specific BMPs would reduce or eliminate the discharge of potential pollutants from stormwater runoff. In addition, the Project applicant would be required to comply with City grading

permit regulations and inspections to reduce sedimentation and erosion. Construction of the Project would not result in discharge that would cause: (1) pollution which would alter the quality of the water of the State (i.e., Los Angeles River) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the water of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes. Furthermore, construction of the Project would not result in discharges that would cause regulatory standards to be violated in the Los Angeles River Watershed. Therefore, temporary construction-related impacts on surface water quality would be less than significant.

6.1.3 Groundwater Hydrology

As stated above, construction activities for the Project would include excavating down approximately 11 feet for subterranean parking, building up the structure, and hardscape and landscape around the structure. As mentioned above, groundwater was not observed at 51.5 feet below ground surface. During construction, temporary dewatering would occur if required. The temporary system would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations. Similar to the Construction General Permit, in order to be authorized to discharge under this Permit, the developer must submit a NOI to discharge groundwater generated from dewatering operations during construction. Due to the operation of dewatering systems being temporary, local groundwater hydrology in the immediate vicinity of the Site is minimally affected. The purpose of dewatering operations is for the protection of both existing and proposed building structures. Due to the limited and temporary nature of temporary dewatering operations, regional impacts to groundwater flow and level are not considered to be significant. Therefore, as Project development would not adversely impact the rate or direction of flow of groundwater and no water supply wells would be affected, the Project would not result in a significant impact on groundwater hydrology during construction.

6.1.4 Groundwater Quality

The Project would include excavations approximately 11-ft below grade for the proposed subterranean garage level and 60-ft for the proposed drywells. The Project would also result in a net export of 105,000 cubic yards of existing soil material. Although not anticipated at the Project Site, any contaminated soils found would be captured within that volume of excavated material, removed from the Project Site, and remediated at an approved disposal facility in accordance with regulatory requirements.

During on-site grading and building construction, hazardous materials, such as fuels, paints, solvents, and concrete additives, could be used and would

therefore require proper management and, in some cases, disposal. The management of any resultant hazardous wastes could increase the opportunity for hazardous materials releases into groundwater. Compliance with all applicable federal, state, and local requirements concerning the handling, storage and disposal of hazardous waste, would reduce the potential for the construction of the Project to release contaminants into groundwater that could affect existing contaminants, expand the area or increase the level of groundwater contamination, or cause a violation of regulatory water quality standards at an existing production well. Due to compliance with measures as listed above and the implementation of BMPs, though there are groundwater production wells or public water supply wells within one mile of the Project Site, construction activities would not be anticipated to affect existing wells. Therefore, the Project would not result in any substantial increase in groundwater contamination through hazardous materials releases and impacts on groundwater quality would be less than significant.

6.2 Operation

6.2.1 Surface Water Hydrology

The Project Site is expected to reduce the percentage of impervious area from the current condition of the Project Site. The Project will develop multiple buildings including subterranean parking and landscape amenity spaces creating a post-Project condition of approximately 95.8% impervious surface area. Due to LID requirement, Project is required to provide at least equivalent of 8% of the site, landscape or biofiltration planter for treating the runoff water.

Based on the HydroCalc calculations, there will be a reduction in the total flow rates stormwater runoff for the 50-year frequency design storm event between the proposed and existing conditions.

Table 2.1 shows the proposed peak flow rates stormwater runoff calculations for the 50-year frequency design storm event. Table 2.2

Table 2.1 Proposed Drainage Stormwater 50-Year Flow

Drainage Area	Area (Acres)	Q_{50} (cfs)
1 (drains to East 6th St)	3.52	7.95
2 (drains to East 6th St)	3.57	8.07
3 (drains to Alameda St)	4.75	10.25
4 (drains to Mill St)	2.77	6.58
TOTAL	14.61	32.85

Table 2.2 Proposed Stormwater Quality Design Flow (85th Percentile)

Drainage Area	Area (Acres)	Q_{85th} (cfs)
1 (drains to East 6th St)	3.52	0.75
2 (drains to East 6th St)	3.57	0.79
3 (drains to Alameda St)	4.75	0.98
4 (drains to Mill St)	2.77	0.61
TOTAL	14.61	3.13

In order to meet LID, the project will implement an infiltration system that will remove the design quality event from the 50-year event which will result in a reduction of the pre-development flow rate. See Table 2.3 for the proposed flow during 50-year storm event to Storm Drain.

Table 2.3 Proposed Flow During 50-Year Storm Event to Storm Drain

Drainage Area	Area (Acres)	Q_{50} - Q_{85th} (cfs)
1 (drains to East 6th St)	3.52	7.20
2 (drains to East 6th St)	3.57	7.28
3 (drains to Alameda St)	4.75	9.27
4 (drains to Mill St)	2.77	5.97
TOTAL	14.61	29.72

Therefore, it is highly unlikely the Project would cause flooding during a 50-year storm event or result in an adverse change to the movement of surface water.

The LID requirements for the Project would outline the stormwater treatment post-construction BMPs required to control pollutants associated with storm events up to the 85th percentile storm event. The Project BMPs will mitigate the stormwater runoff quality and quantity.

6.2.2 Surface Water Quality

The Project will not increase concentrations of the items listed as constituents of concern for the Los Angeles River Watershed.

Under section 3.1.3. of the LID Manual, post-construction stormwater runoff from new Projects must be infiltrated, evapotranspirated, capture and used, and/or treated through high efficiency BMPs for the volume of water produced by the 85th percentile storm event. The Project will implement multiple pre-treatment facilities and dry-wells across the site for managing stormwater runoff in accordance with current LID requirements.

Operation of the Project would not result in discharges that would cause: (1) pollution which would alter the quality of the waters of the State (i.e., Los

Angeles River) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes.

As is typical of most urban developments, stormwater runoff from the Project Site has the potential to introduce pollutants into the stormwater system. Anticipated and potential pollutants generated by the Project include sediment, nutrients, pesticides, metals, pathogens, and oil and grease. The pollutants listed above would be mitigated through the implementation of approved LID BMPs.

Furthermore, operation of the Project would not result in discharges that would cause regulatory standards to be violated. A portion of the Project Site will be allocated to stormwater mitigation, in compliance with LID BMP requirements, to control and treat stormwater runoff to mitigate the 85th percentile storm event. The installed BMP systems will be designed with an internal bypass overflow system to prevent upstream flooding during major storm events. Implementation of LID BMPs will mitigate operational impacts on surface water quality.

6.2.3 Groundwater Hydrology

The Project will develop hardscape and structures that cover approximately 95.8% of the Project Site with impervious surfaces and would not have any impact on the groundwater recharge potential. Any runoff which bypasses the BMP systems would discharge to an approved discharge point in the public right-of-way and not result in infiltration of a large amount of rainfall that would affect groundwater hydrology. The Project's potential impact on groundwater recharge is less than significant.

The Project would include excavations approximately 11-ft below grade for the proposed subterranean garage level and 60-ft for the proposed drywells. The Project would also result in a net export of 105,000 cubic yards existing soil material. Any contaminated soils found would be captured with that volume of excavated material, removed from the Project Site and remediated at an approved disposal facility in accordance with regulatory requirements.

During on-site grading and building construction, hazardous materials, such as fuels, paints, solvents, and concrete additives, could be used and would therefore require proper management and, in some cases, disposal. The management of any resultant hazardous wastes could increase the opportunity for hazardous materials releases into groundwater. Compliance with all applicable federal, state, and local requirements concerning the handling, storage and disposal of hazardous waste, would reduce the potential for the construction of the Project to release contaminants into groundwater that could affect existing contaminants, expand the area or increase the level of groundwater

contamination, or cause a violation of regulatory water quality standards at an existing production well. Due to compliance with measures as listed above and the implementation of BMPs, though there are groundwater production wells or public water supply wells within one mile of the Project Site, construction activities would not be anticipated to affect existing wells. Therefore, the Project would not result in any substantial increase in groundwater contamination through hazardous materials releases and impacts on groundwater quality would be less than significant.

6.2.4 Groundwater Quality

The Project does not include the installation of water wells, or any extraction or recharge system that is in the vicinity of the coast, an area of known groundwater contamination or seawater intrusion, a municipal supply well or spreading ground facility.

Operational activities which could affect groundwater quality include hazardous material spills and leaking underground storage tanks. No underground storage tanks are currently operated or will be operated by the Project. The Project would not expand any potential areas of contamination, increasing the level of contamination, or cause regulatory water quality standard violations, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act.

The Project is not anticipated to result in releases or spills of contaminants that could reach a groundwater recharge area or spreading ground or otherwise reach groundwater through percolation. The Project does not involve drilling to or through a clean or contaminated aquifer. Therefore, the Project's potential impact on groundwater recharge is less than significant.

6.3 Cumulative Impact Analysis

6.3.1 Surface Water Hydrology

The geographic context for the cumulative impact analysis on surface water hydrology is the Los Angeles River Watershed. In accordance with City requirements, the Project and related Projects would be required to implement BMPs to manage stormwater runoff in accordance with LID guidelines. Furthermore, the City of Los Angeles Department of Public Works reviews Projects on a case-by-case basis to ensure sufficient local and regional infrastructure is available to accommodate stormwater runoff. Therefore, potential cumulative impacts associated with the Project on surface water hydrology would be less than significant.

6.3.2 Surface Water Quality

Future growth in the Los Angeles River Watershed would be subject to NPDES requirements relating to water quality for both construction and operation. The Project Site is located in a highly urbanized area and it is anticipated that future

development Projects would also be subject to LID requirements. The Project would comply with all applicable laws, rules and regulations, so cumulative impacts to surface water quality would be less than significant.

6.3.3 Groundwater Hydrology

The geographic context for the cumulative impact analysis on groundwater level is the Central Basin. Though there are groundwater production wells or public water supply wells within one mile of the Project Site, construction activities would not be anticipated to affect existing wells due to implementation of BMPs and the compliance with all applicable federal, state, and local requirements concerning the handling, storage and disposal of hazardous waste.

The Project is located in a highly urbanized area so any potential reduction or increase in groundwater would be minimal in the context of the regional groundwater basin. Therefore, cumulative impacts to groundwater hydrology would be less than significant.

6.3.4 Groundwater Quality

Future growth in the Central Basin would be subject to LARWQCB requirements relating to groundwater quality. The Project would not expand any potential areas of contamination, increasing the level of contamination, or cause regulatory water quality standard violations, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. The Project would comply with all applicable laws, rules and regulations, so cumulative impacts to surface water quality would be less than significant.

7.0 LEVEL OF SIGNIFICANCE

Based on the analysis contained in this report, no significant impacts have been identified for surface water hydrology, surface water quality, groundwater hydrology, or groundwater quality for this Project.

8.0 REFERENCES

1. https://www.waterboards.ca.gov/water_issues/programs/tmdl/2018state_ir_reports_final/apx_c_state_factsheets/01095.shtml

2. City of Los Angeles. LA. CEQA Thresholds Guide. 2006 https://planning.lacity.org/eir/CrossroadsHwd/deir/files/references/A07.pdf

COUNTY OF LOS ANGELES

LOS ANGELES RIVER WATERSHED

Los Angeles River Watershed

PACIFIC OCEAN

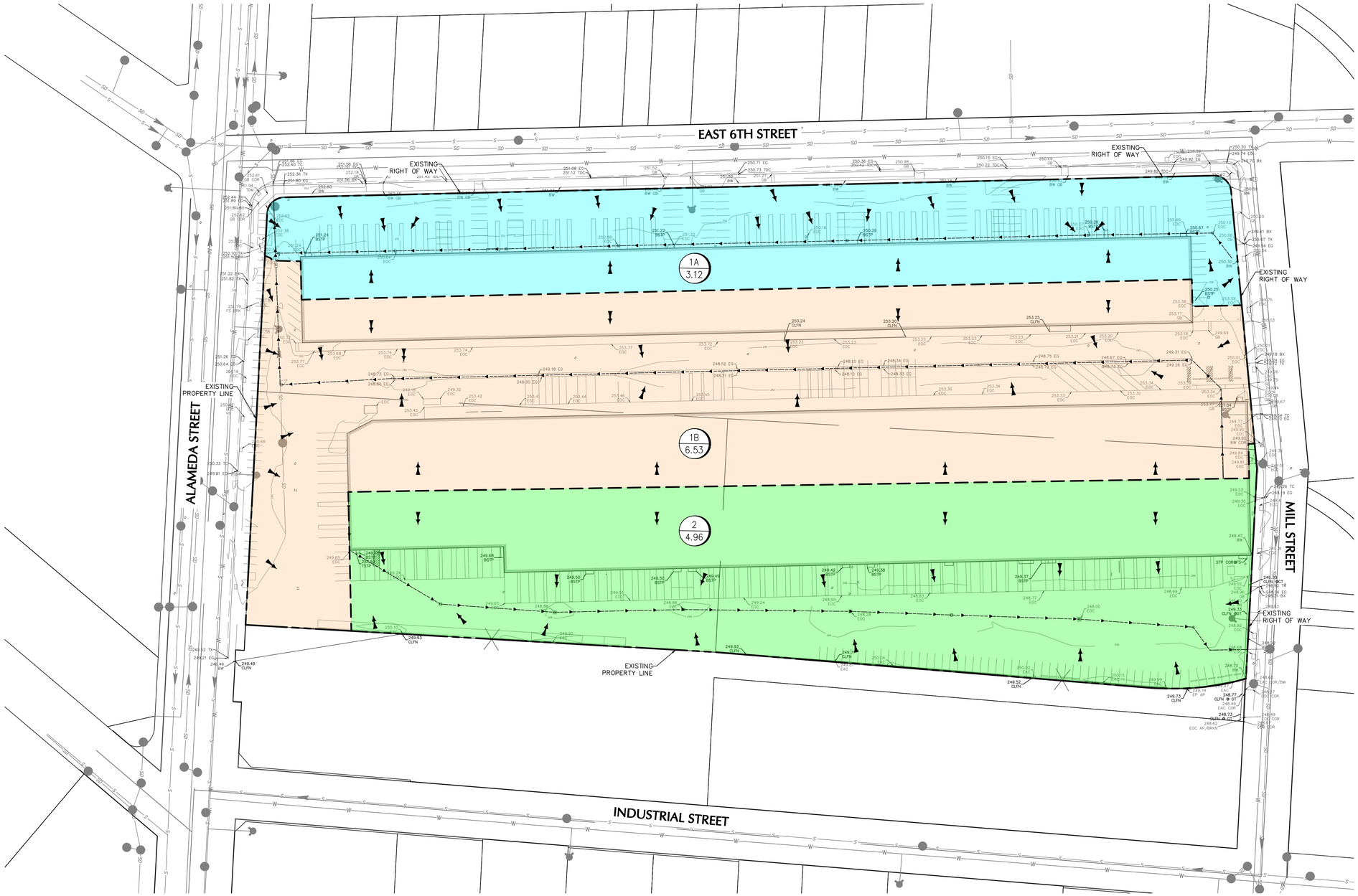
PROJECT SITE

MILES
0 1 2 4

LEGEND

- LOS ANGELES RIVER WATERSHED
- UNINCORPORATED AREA
- DAM / LAKE / RESERVOIR
- MAJOR RIVER
- MAJOR CHANNEL

Data contained in this map is produced in whole or part from the Los Angeles County Department of Public Works' digital database.



LEGEND

- PROJECT DRAINAGE BOUNDARY
- SUB-AREA BOUNDARY
- FLOW PATH
- SUB-DRAINAGE AREA ID
- SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)
- FLOW ARROW
- TOTAL DRAINAGE SURFACE AREA – AREA 1A
- TOTAL DRAINAGE SURFACE AREA – AREA 1B
- TOTAL DRAINAGE SURFACE AREA – AREA 2

EXISTING DRAINAGE AREA SUMMARY

SUBAREAS ID	DRAINAGE AREA (AC)	IMPERVIOUS PERCENTAGE (%)	FLOW LENGTH (FT)	FLOW SLOPE (ASSUMED %)	SOIL TYPE	50-YR 24-HR ISOHYET (IN)	PEAK FLOW FOR 50-YR STORM EVENT (CFS)
1A (DRAINS TO EAST 6TH ST)	3.12	100	1100	1	6	5.90	6.82
1B (DRAINS TO EAST 6TH ST)	6.53	100	1400	1	6	5.90	13.20
2 (DRAINS TO MILL ST)	4.96	100	1100	1	6	5.90	10.85
TOTAL:	14.61	100	--	--	--	--	30.87

60 0 20 40 60
SCALE: 1 INCH = 60 FEET

Date	Description	No.
Revisions		

Signature Date

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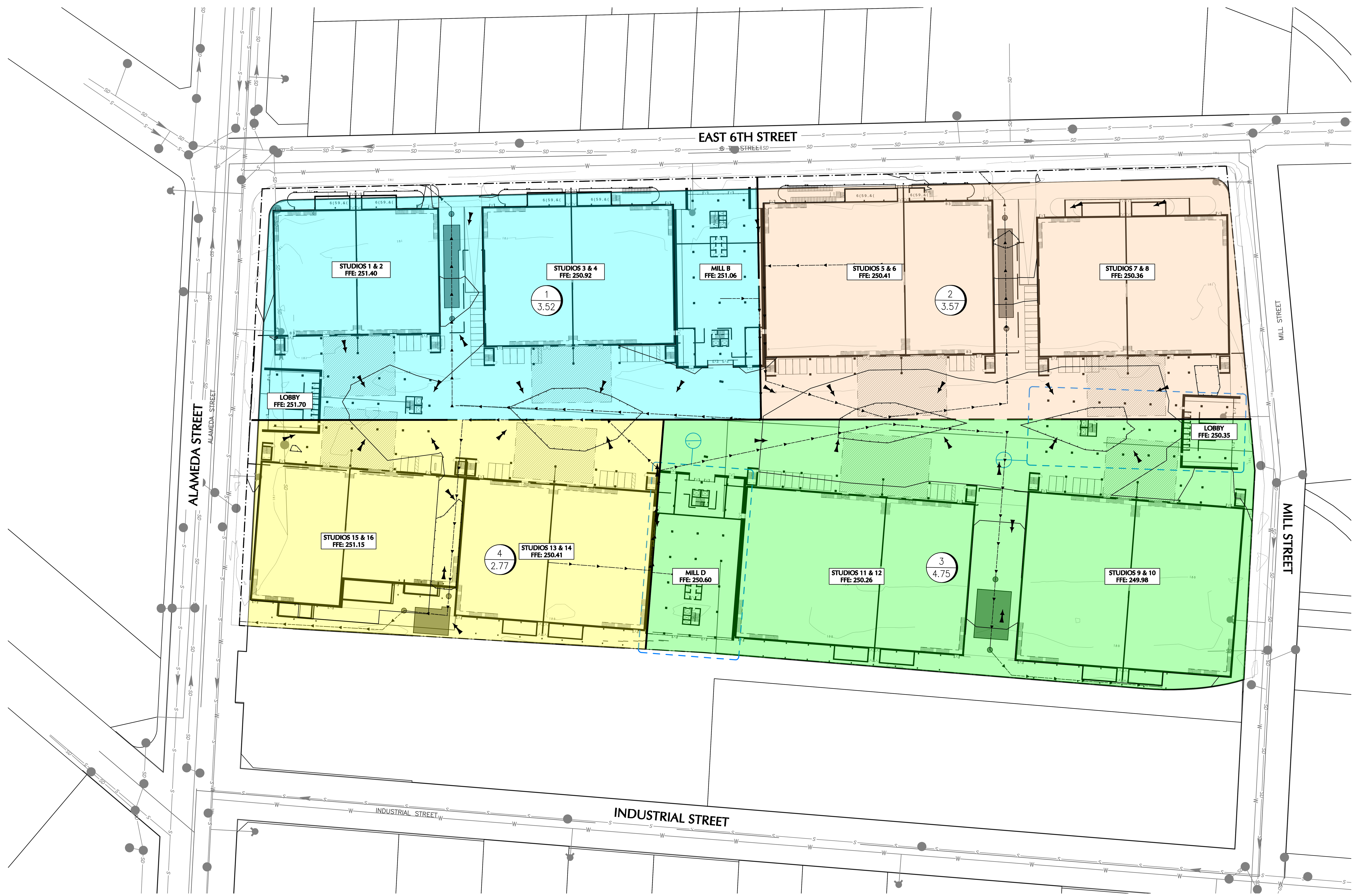
Project
EAST END STUDIOS ARTS DISTRICT
CITY OF LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Drawing Title
EXISTING DRAINAGE EXHIBIT

Project No.	Drawing No.
700118201	2
Date: 08/15/2022	
Drawn By: NL	
Checked By: KK & KR	Sheet 1 of 2

LANGAN Project No. 700118201



LEGEND

- PROJECT DRAINAGE BOUNDARY
- SUB-AREA BOUNDARY
- FLOW PATH
- SUB-DRAINAGE AREA ID
- SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)
- FLOW ARROW
- TOTAL DRAINAGE SURFACE AREA – AREA 1
- TOTAL DRAINAGE SURFACE AREA – AREA 2
- TOTAL DRAINAGE SURFACE AREA – AREA 3
- TOTAL DRAINAGE SURFACE AREA – AREA 4

PROPOSED DRAINAGE AREA SUMMARY

SUBAREAS ID	DRAINAGE AREA (AC)	IMPERVIOUS PERCENTAGE (%)	FLOW LENGTH (FT)	FLOW SLOPE (ASSUMED %)	SOIL TYPE	50-YR 24-HR ISOHYET (IN)	PEAK FLOW FOR 50-YR STORM EVENT (CFS)	PEAK FLOW FOR 85TH PERCENTILE STORM EVENT (CFS)
1 (DRAINS TO EAST 6TH ST)	3.52	98	900	1	6	5.90	8.03	0.82
2 (DRAINS TO EAST 6TH ST)	3.57	98	800	1	6	5.90	8.56	0.87
3 (DRAINS TO ALAMEDA ST)	4.75	98	1000	1	6	5.90	10.36	1.07
4 (DRAINS TO MILL ST)	2.77	98	800	1	6	5.90	6.64	0.67
TOTAL:	14.61	98	--	--	--	--	33.30	3.44

60 0 20 40 60
SCALE: 1 INCH = 60 FEET

Date	Description	No.

Revisions

Signature Date

LANGAN

Project

EAST END STUDIOS ARTS DISTRICT

CITY OF LOS ANGELES

LOS ANGELES COUNTY CALIFORNIA

Drawing Title

PROPOSED DRAINAGE EXHIBIT

Project No. 700118201

Date 08/15/2022

Drawn By NL

Checked By KK & KR

Drawing No. 3

Sheet 2 of 2

Project No. 700118201

Peak Flow Hydrologic Analysis

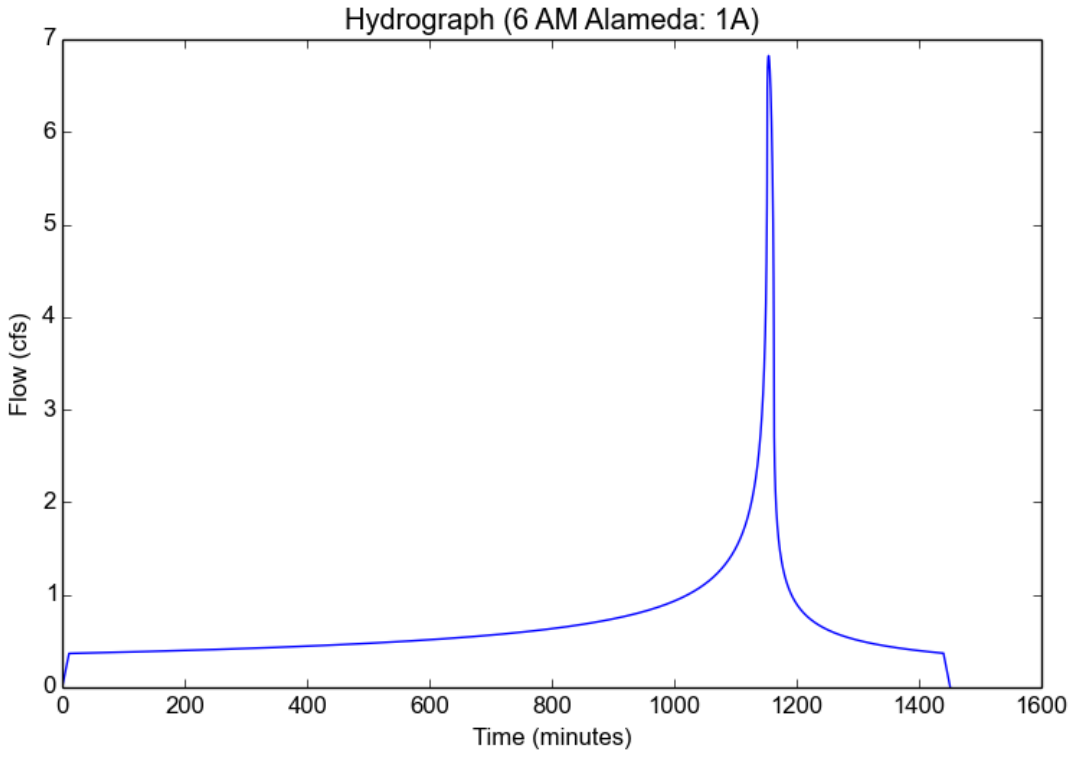
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/test existing.p
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	1A
Area (ac)	3.12
Flow Path Length (ft)	1100.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.4301
Undeveloped Runoff Coefficient (Cu)	0.7795
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	6.8236
Burned Peak Flow Rate (cfs)	6.8236
24-Hr Clear Runoff Volume (ac-ft)	1.3692
24-Hr Clear Runoff Volume (cu-ft)	59642.0109



Peak Flow Hydrologic Analysis

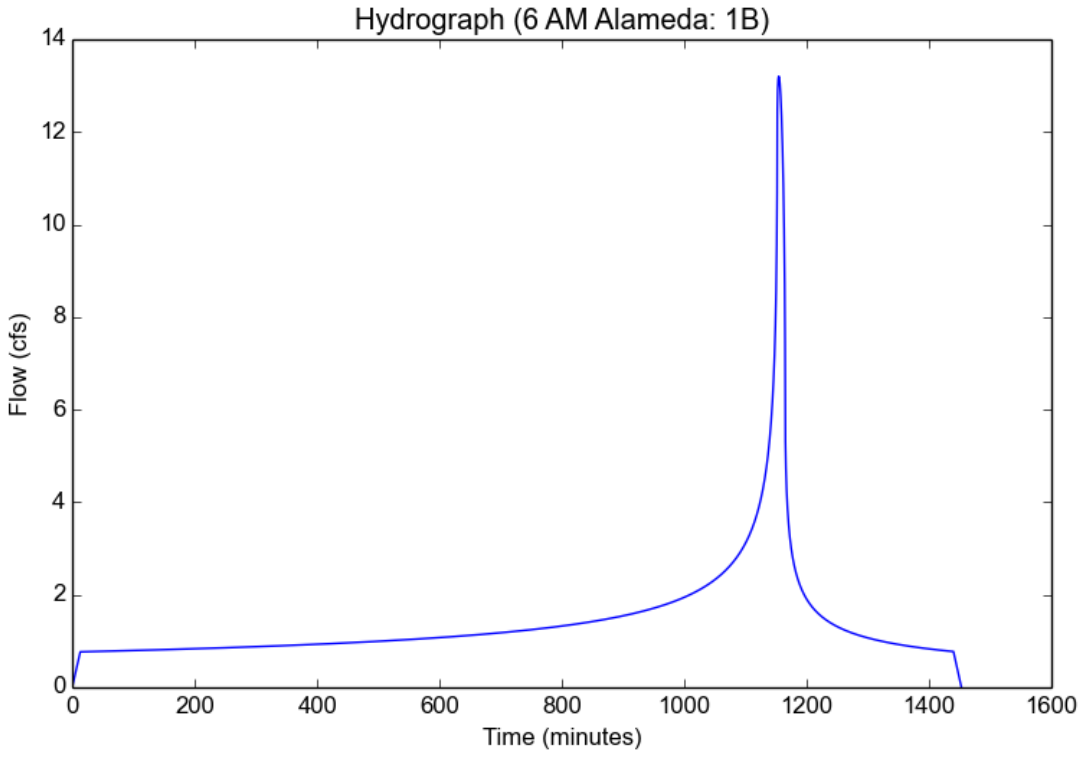
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/test existing.p
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	1B
Area (ac)	6.53
Flow Path Length (ft)	1400.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.2466
Undeveloped Runoff Coefficient (Cu)	0.7594
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	13.203
Burned Peak Flow Rate (cfs)	13.203
24-Hr Clear Runoff Volume (ac-ft)	2.8657
24-Hr Clear Runoff Volume (cu-ft)	124827.7461



Peak Flow Hydrologic Analysis

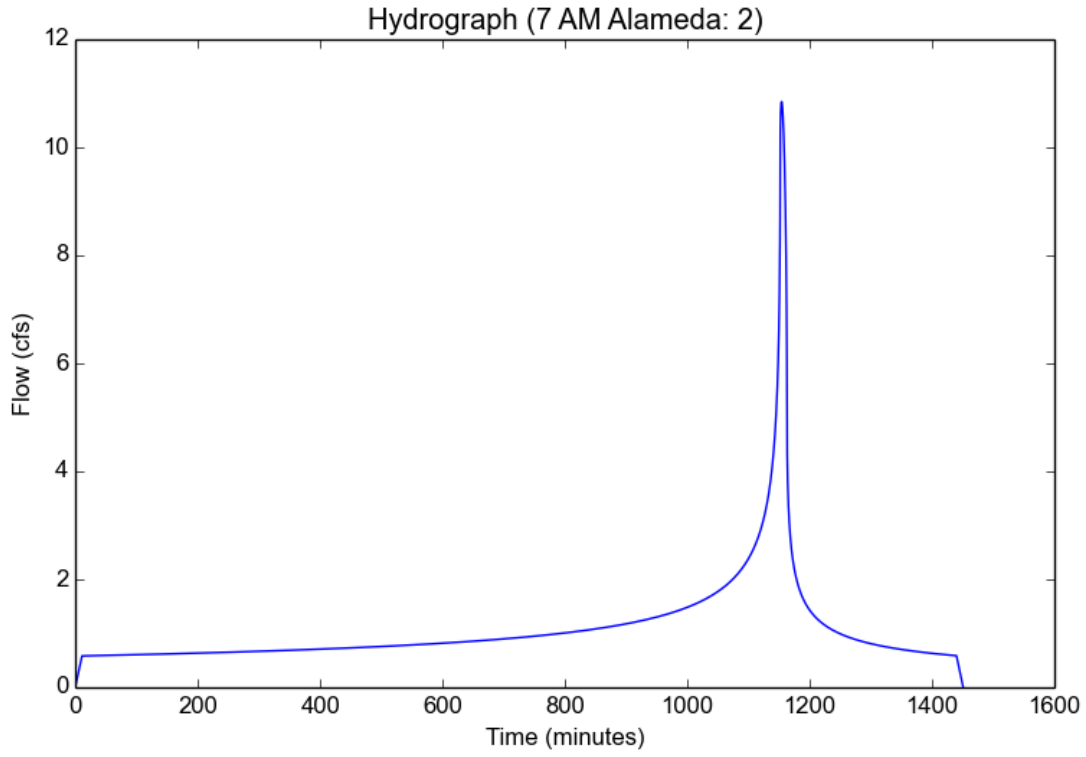
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/test existing.p
Version: HydroCalc 1.0.3

Input Parameters

Project Name	7 AM Alameda
Subarea ID	2
Area (ac)	4.96
Flow Path Length (ft)	1100.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.4301
Undeveloped Runoff Coefficient (Cu)	0.7795
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	10.8478
Burned Peak Flow Rate (cfs)	10.8478
24-Hr Clear Runoff Volume (ac-ft)	2.1767
24-Hr Clear Runoff Volume (cu-ft)	94815.5045



Peak Flow Hydrologic Analysis

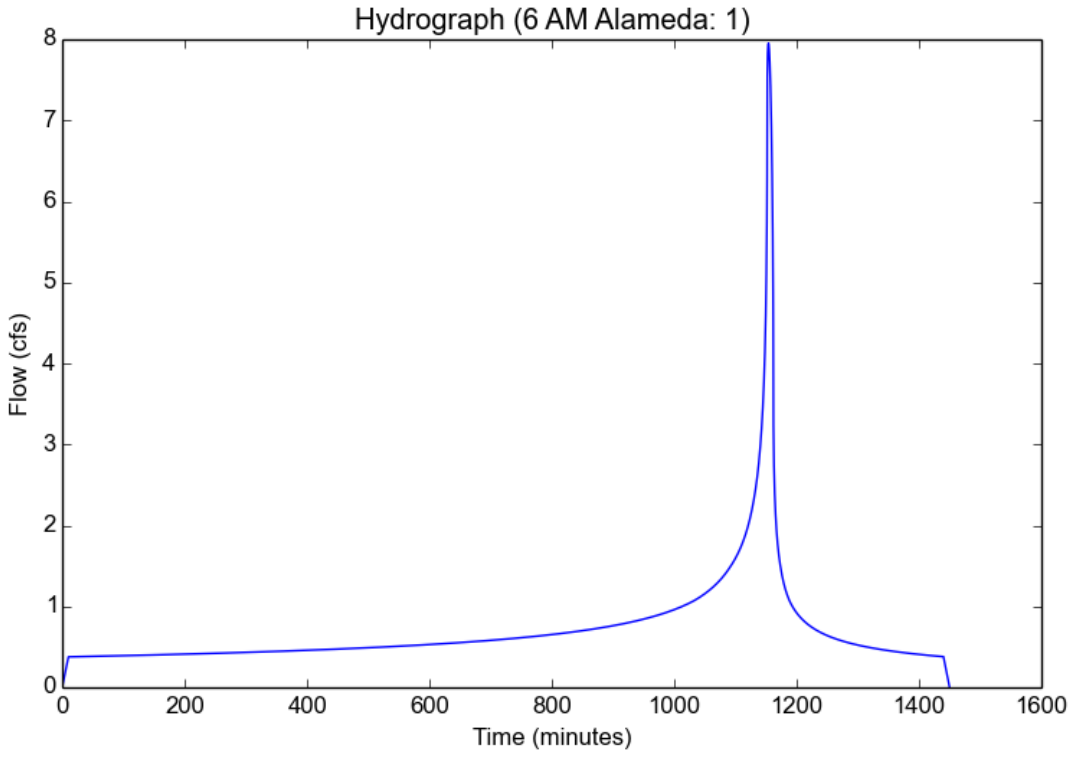
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/6 AM Alameda
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	1
Area (ac)	3.52
Flow Path Length (ft)	900.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.5414
Undeveloped Runoff Coefficient (Cu)	0.7901
Developed Runoff Coefficient (Cd)	0.889
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	7.9528
Burned Peak Flow Rate (cfs)	7.9528
24-Hr Clear Runoff Volume (ac-ft)	1.4268
24-Hr Clear Runoff Volume (cu-ft)	62152.6915



Peak Flow Hydrologic Analysis

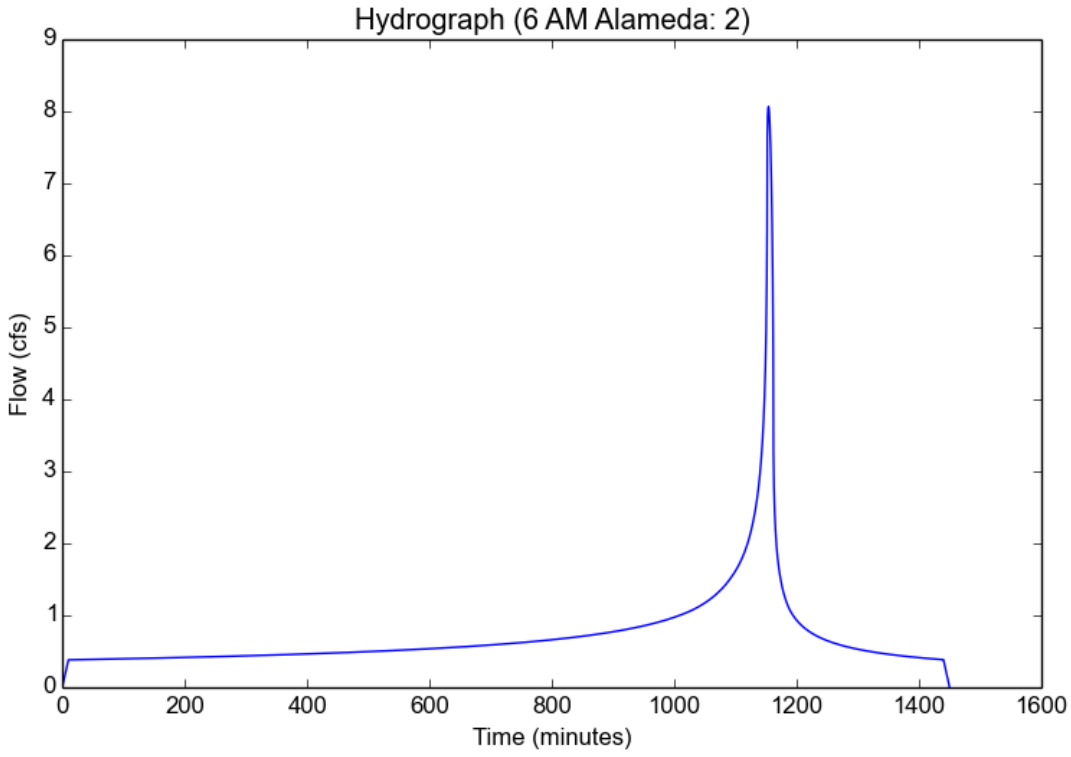
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/6 AM Alamed
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	2
Area (ac)	3.57
Flow Path Length (ft)	900.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.5414
Undeveloped Runoff Coefficient (Cu)	0.7901
Developed Runoff Coefficient (Cd)	0.889
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	8.0658
Burned Peak Flow Rate (cfs)	8.0658
24-Hr Clear Runoff Volume (ac-ft)	1.4471
24-Hr Clear Runoff Volume (cu-ft)	63035.5422



Peak Flow Hydrologic Analysis

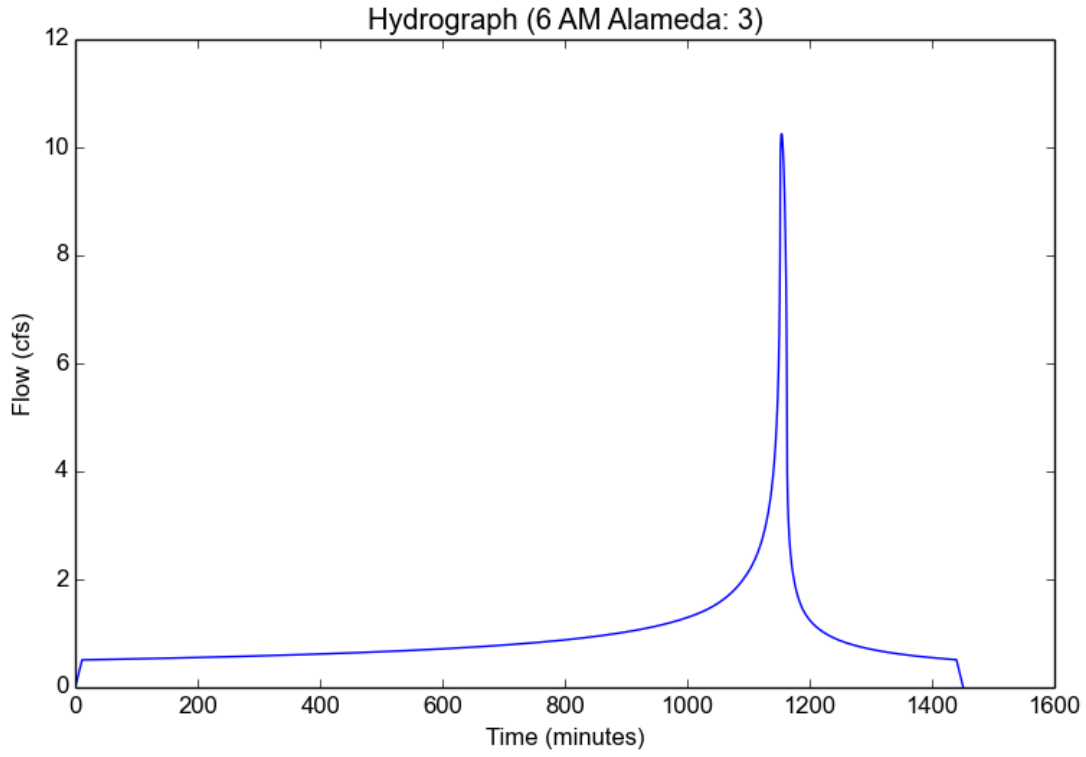
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/6 AM Alameda
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	3
Area (ac)	4.75
Flow Path Length (ft)	1000.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.4301
Undeveloped Runoff Coefficient (Cu)	0.7795
Developed Runoff Coefficient (Cd)	0.8879
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	10.2494
Burned Peak Flow Rate (cfs)	10.2494
24-Hr Clear Runoff Volume (ac-ft)	1.9253
24-Hr Clear Runoff Volume (cu-ft)	83867.9154



Peak Flow Hydrologic Analysis

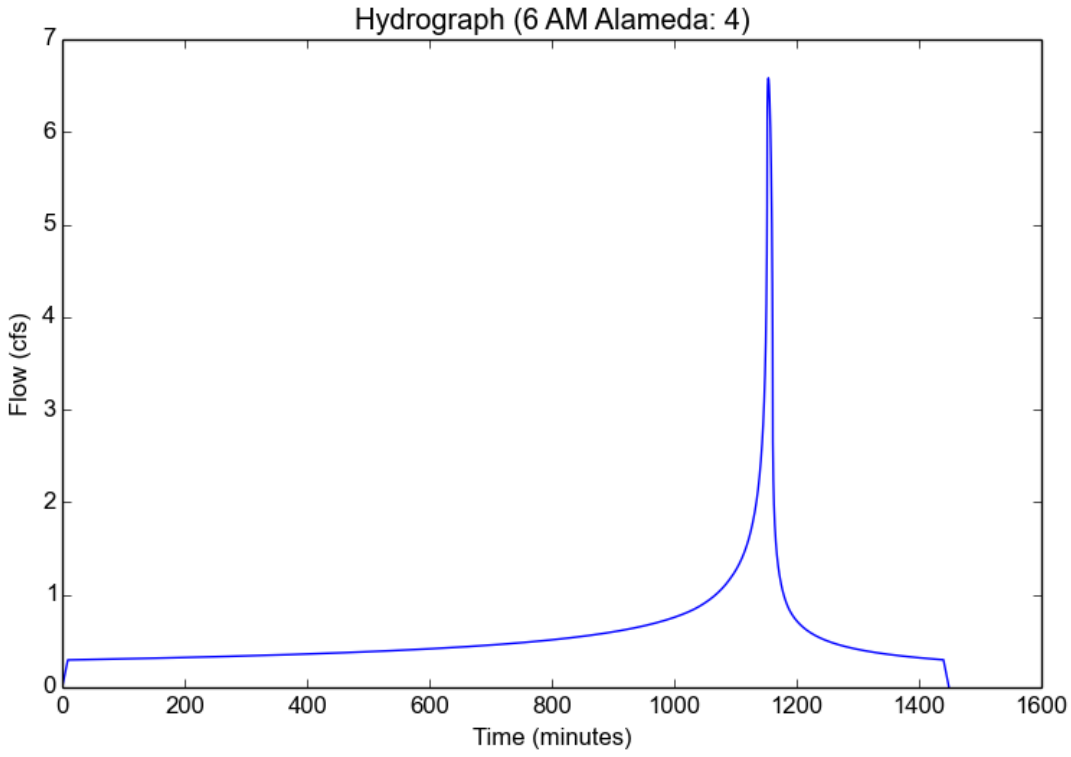
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/6 AM Alameda
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	4
Area (ac)	2.77
Flow Path Length (ft)	800.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.6704
Undeveloped Runoff Coefficient (Cu)	0.7991
Developed Runoff Coefficient (Cd)	0.8899
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	6.5827
Burned Peak Flow Rate (cfs)	6.5827
24-Hr Clear Runoff Volume (ac-ft)	1.1228
24-Hr Clear Runoff Volume (cu-ft)	48911.2056



Peak Flow Hydrologic Analysis

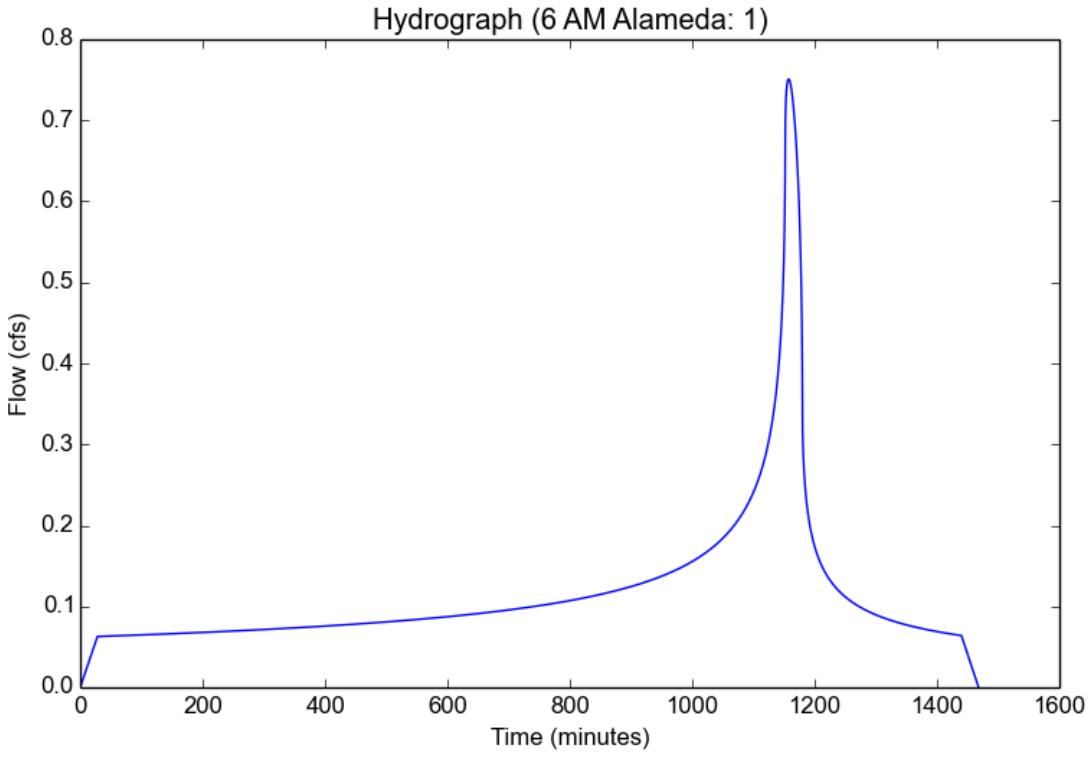
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/6 AM Alameda
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	1
Area (ac)	3.52
Flow Path Length (ft)	587.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.98
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.98
Peak Intensity (in/hr)	0.2602
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	0.751
Burned Peak Flow Rate (cfs)	0.751
24-Hr Clear Runoff Volume (ac-ft)	0.2338
24-Hr Clear Runoff Volume (cu-ft)	10183.3209



Peak Flow Hydrologic Analysis

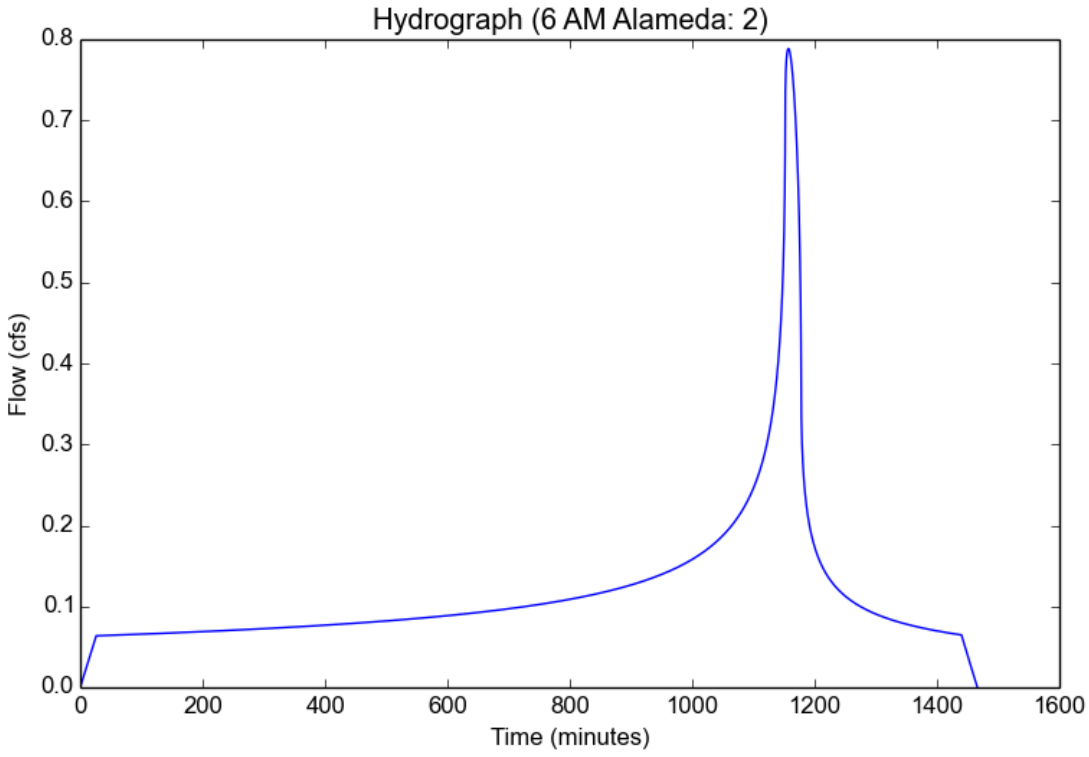
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/6 AM Alameda
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	2
Area (ac)	3.57
Flow Path Length (ft)	524.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.98
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.98
Peak Intensity (in/hr)	0.2694
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	0.7887
Burned Peak Flow Rate (cfs)	0.7887
24-Hr Clear Runoff Volume (ac-ft)	0.2371
24-Hr Clear Runoff Volume (cu-ft)	10327.956



Peak Flow Hydrologic Analysis

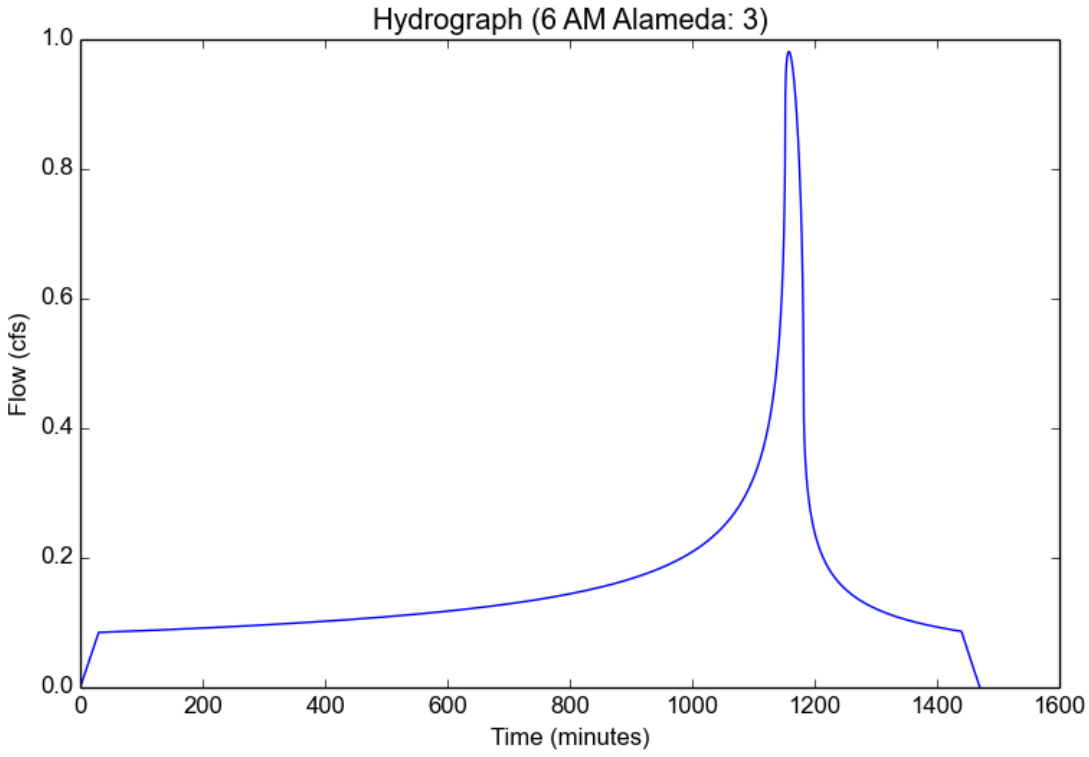
File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/6 AM Alameda
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	3
Area (ac)	4.75
Flow Path Length (ft)	658.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.98
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.98
Peak Intensity (in/hr)	0.2519
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.9811
Burned Peak Flow Rate (cfs)	0.9811
24-Hr Clear Runoff Volume (ac-ft)	0.3155
24-Hr Clear Runoff Volume (cu-ft)	13741.7178



Peak Flow Hydrologic Analysis

File location: //langan.com/data/IRV/data2/700118201/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/HydroCalc Calculations/6 AM Alamed
Version: HydroCalc 1.0.3

Input Parameters

Project Name	6 AM Alameda
Subarea ID	4
Area (ac)	2.77
Flow Path Length (ft)	536.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.98
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.98
Peak Intensity (in/hr)	0.2694
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	0.6119
Burned Peak Flow Rate (cfs)	0.6119
24-Hr Clear Runoff Volume (ac-ft)	0.184
24-Hr Clear Runoff Volume (cu-ft)	8013.5681

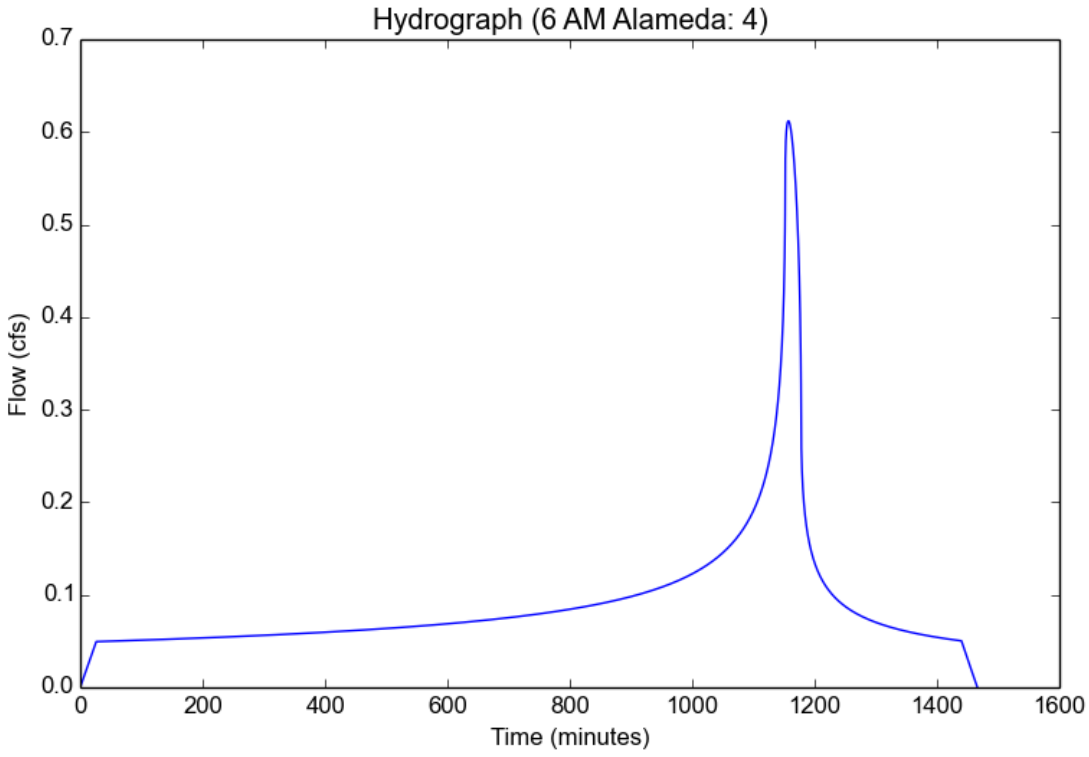
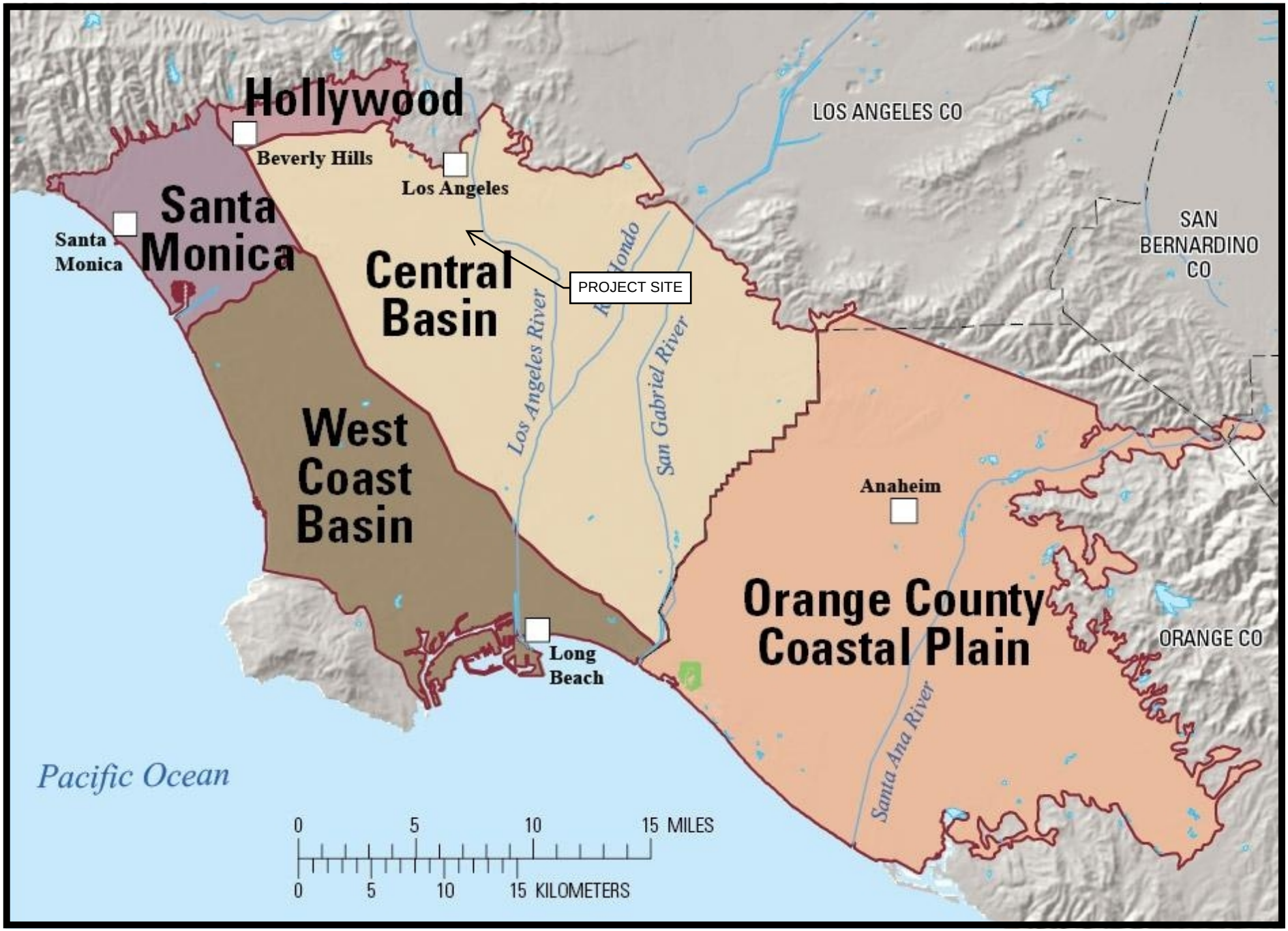


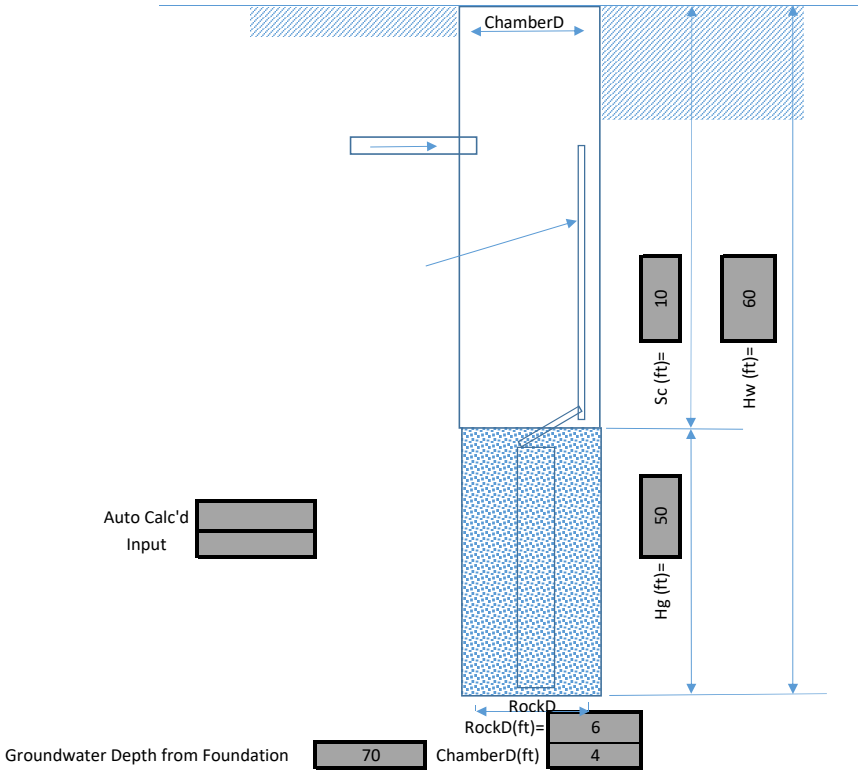
Figure 5. Coastal Plain of Los Angeles Groundwater Basin



6AM Alameda

Water Quality Treatment Calculation- Dry Well 1

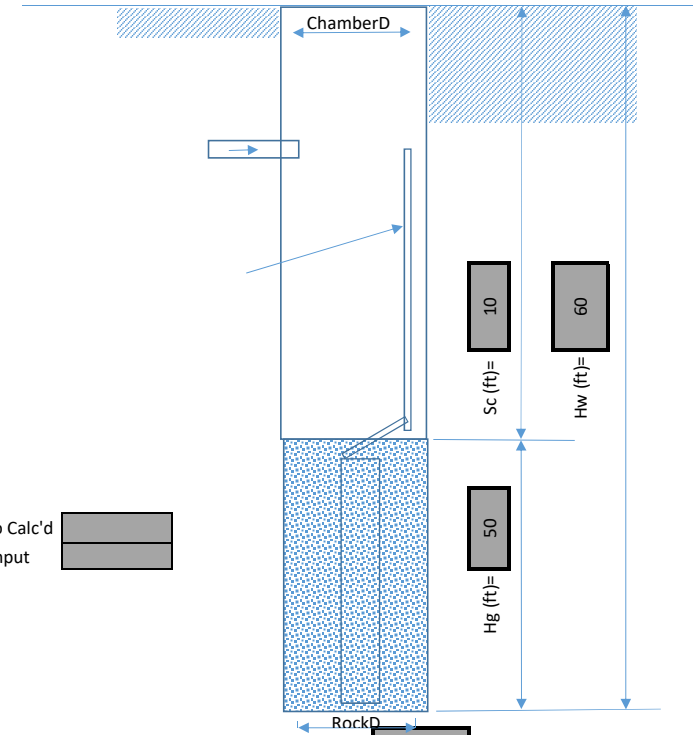
TOTAL Area (A)	153,217	ft^2
Impervious Area (A_I)	153,217	ft^2
Undeveloped Area (A_U)	0	ft^2
Pervious Area (A_p)	0	ft^2
85th Percentile or 0.75 inch (P)	1.00	in
V_m = (P/12 ft) x [(A_I)(0.9)+(A_p+A_u)(0.1)] =	**11,491**	**ft^3**
k_{SAT},measured (per geotechnical report)=	11.6	in/hr
Factor of Safety (FS) =	3	
k_{SAT},design = k_{SAT},measured /FS =	3.87	in/hr
Drawdown Time (T) =	96	hr
k_{SAT} (ft/s)=	**8.95062E-05**	**ft/s**
Amin = (Vm*12 in/ft)/(T*ksat,design) =	**371**	**ft^2**
Adrywell =(Depth of Infiltration*CircumferenceRock + AreaRock$_{Bottom}$)	**971**	**ft^2**
Design rate with Infiltration area for flow (disposal) rate (ksat*Adrywell)	**0.0869**	**ft^3/s**
Volume disposal rates:		
$V_{96\text{-}hr}$: k_{SAT}*96hrs*3600s/hr	30029	ft^3
$V_{3\text{-}hr}$: k_{SAT}*3hrs*3600s/hr	**938**	**ft^3**
V_{WELL} = (Sc*Area$_{CHAMBER}$+Hg*AreaRock*40%)	**691**	**ft^3**
Drywells Required	**1**	
$V_{WELL\ TOTAL}$= V_{WELL} * #Wells =	**691**	**ft^3**
$V_{3\text{-}hr\ TOTAL}$= $V_{3\text{-}hr}$ * #Wells =	**938**	**ft^3**
Pre-Treatment Height	**15**	**ft**
$V_{PRE\text{-}TREATMENT}$=	**282**	**ft^3**
$V_{DRYWELL\ SYSTEM}$ = $V_{WELL\ TOTAL}$ + $V_{3\text{-}HR\ TOTAL}$ + $V_{PRE\text{-}TREATMENT}$ =	**1911**	**ft^3**
Volume storage chamber required= V_m - $V_{DRYWELL}$=	**9,580**	**ft^3**



6AM Alameda

Water Quality Treatment Calculation- Dry Well 2

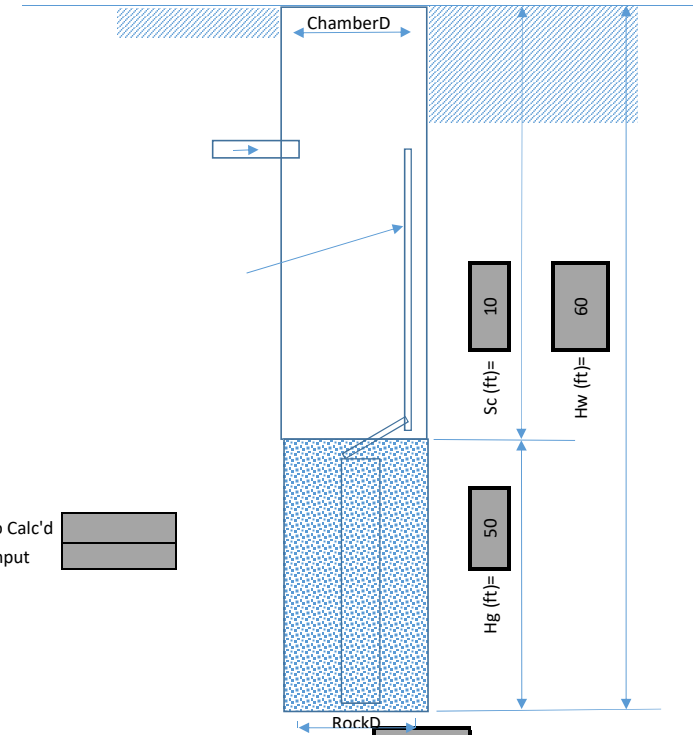
TOTAL Area (A)	155,663	ft^2
Impervious Area (A_I)	155,663	ft^2
Undeveloped Area (A_U)	0	ft^2
Pervious Area (A_p)	0	ft^2
85th Percentile or 0.75 inch (P)	1.00	in
V_m = (P/12 ft) x [(A_I)(0.9)+(A_p+A_u)(0.1)] =	**11,675**	**ft^3**
k_{SAT},measured (per geotechnical report)=	11.6	in/hr
Factor of Safety (FS) =	3	
k_{SAT},design = k_{SAT},measured /FS =	3.87	in/hr
Drawdown Time (T) =	96	hr
k_{SAT} (ft/s)=	**8.95062E-05**	**ft/s**
Amin = (Vm*12 in/ft)/(T*ksat,design) =	**377**	**ft^2**
Adrywell =(Depth of Infiltration*CircumferenceRock + $AreaRock_{Bottom}$)	**971**	**ft^2**
Design rate with Infiltration area for flow (disposal) rate (ksat*Adrywell)	**0.0869**	**ft^3/s**
Volume disposal rates:		
$V_{96\text{-}hr}$: k_{SAT}*96hrs*3600s/hr	30029	ft^3
$V_{3\text{-}hr}$: k_{SAT}*3hrs*3600s/hr	**938**	**ft^3**
V_{WELL} = (Sc*$Area_{CHAMBER}$+Hg*AreaRock*40%)	**691**	**ft^3**
Drywells Required	**1**	
$V_{WELL\ TOTAL}$= V_{WELL} * #Wells =	**691**	**ft^3**
$V_{3\text{-}hr\ TOTAL}$= $V_{3\text{-}hr}$ * #Wells =	**938**	**ft^3**
Pre-Treatment Height	**15**	**ft**
$V_{PRE\text{-}TREATMENT}$=	**282**	**ft^3**
$V_{DRYWELL\ SYSTEM}$ = $V_{WELL\ TOTAL}$ + $V_{3\text{-}HR\ TOTAL}$ + $V_{PRE\text{-}TREATMENT}$ =	**1911**	**ft^3**
Volume storage chamber required= V_m - $V_{DRYWELL}$=	**9,764**	**ft^3**



6AM Alameda

Water Quality Treatment Calculation- Dry Well 3

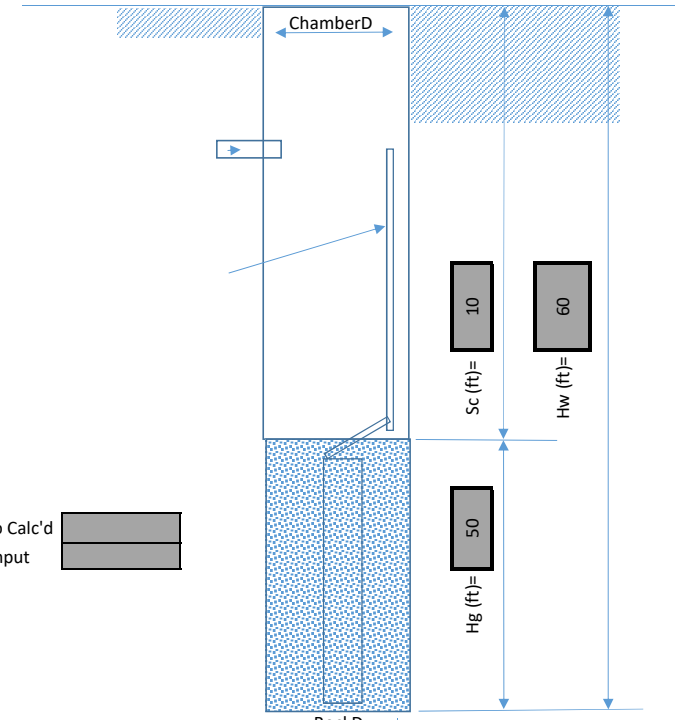
TOTAL Area (A)	206,731	ft^2
Impervious Area (A_I)	206,731	ft^2
Undeveloped Area (A_U)	0	ft^2
Pervious Area (A_p)	0	ft^2
85th Percentile or 0.75 inch (P)	1.00	in
V_m = (P/12 ft) x [(A_I)(0.9)+(A_p+A_u)(0.1)] =	**15,505**	**ft^3**
k_{SAT},measured (per geotechnical report)=	11.6	in/hr
Factor of Safety (FS) =	3	
k_{SAT},design = k_{SAT},measured /FS =	3.87	in/hr
Drawdown Time (T) =	96	hr
k_{SAT} (ft/s)=	**8.95062E-05**	**ft/s**
Amin = (Vm*12 in/ft)/(T*ksat,design) =	**501**	**ft^2**
Adrywell =(Depth of Infiltration*CircumferenceRock + $AreaRock_{Bottom}$)	**971**	**ft^2**
Design rate with Infiltration area for flow (disposal) rate (ksat*Adrywell)	**0.0869**	**ft^3/s**
Volume disposal rates:		
$V_{96\text{-}hr}$: k_{SAT}*96hrs*3600s/hr	30029	ft^3
$V_{3\text{-}hr}$: k_{SAT}*3hrs*3600s/hr	**938**	**ft^3**
V_{WELL} = (Sc*$Area_{CHAMBER}$+Hg*AreaRock*40%)	**691**	**ft^3**
Drywells Required	**1**	
$V_{WELL\ TOTAL}$= V_{WELL} * #Wells =	**691**	**ft^3**
$V_{3\text{-}hr\ TOTAL}$= $V_{3\text{-}hr}$ * #Wells =	**938**	**ft^3**
Pre-Treatment Height	**15**	**ft**
$V_{PRE\text{-}TREATMENT}$=	**282**	**ft^3**
$V_{DRYWELL\ SYSTEM}$ = $V_{WELL\ TOTAL}$ + $V_{3\text{-}HR\ TOTAL}$ + $V_{PRE\text{-}TREATMENT}$ =	**1911**	**ft^3**
Volume storage chamber required= V_m - $V_{DRYWELL}$=	**13,594**	**ft^3**

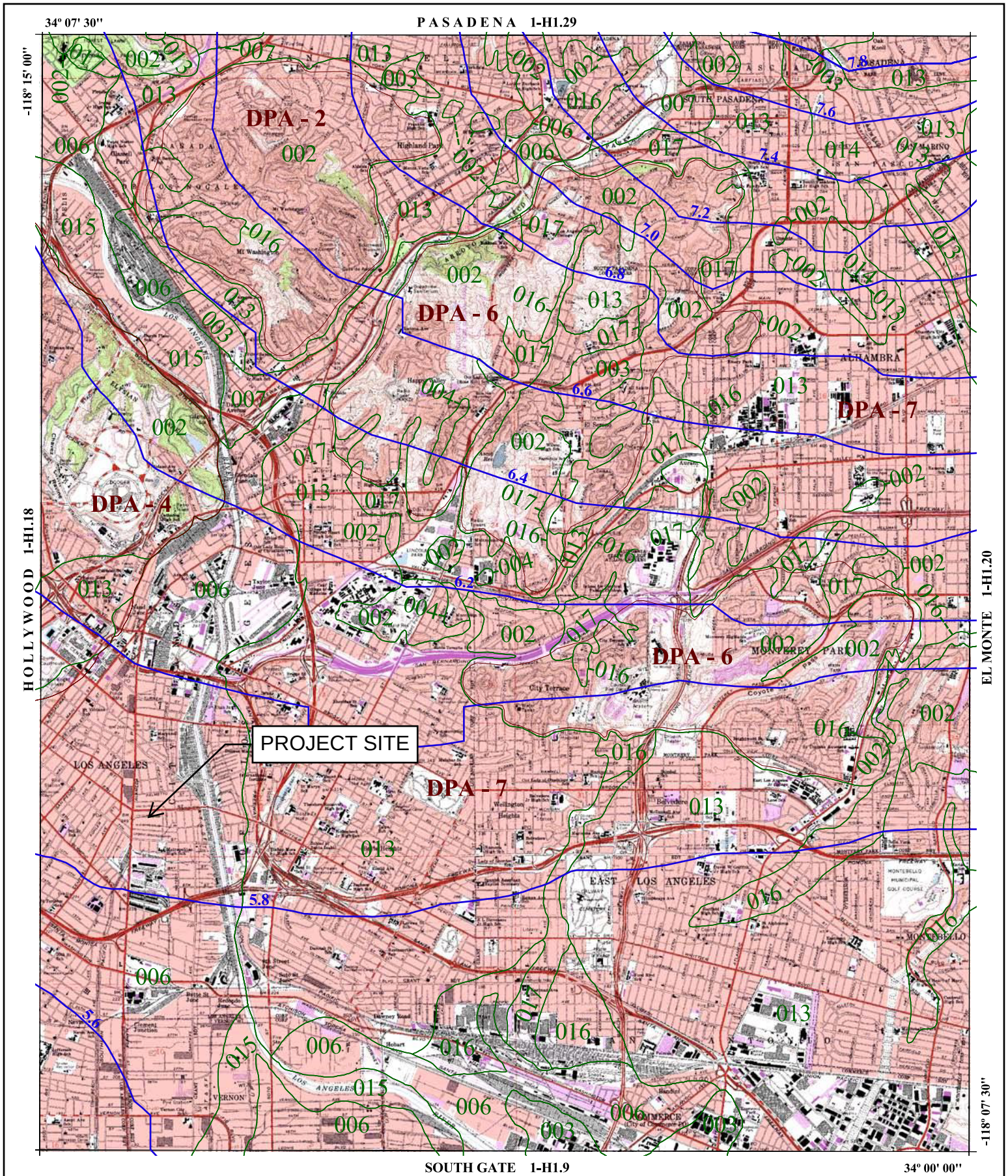


6AM Alameda

Water Quality Treatment Calculation- Dry Well 4

TOTAL Area (A)	120,589	ft^2
Impervious Area (A_I)	120,589	ft^2
Undeveloped Area (A_U)	0	ft^2
Pervious Area (A_p)	0	ft^2
85th Percentile or 0.75 inch (P)	1.00	in
V_m = (P/12 ft) x [(A_I)(0.9)+(A_p+A_u)(0.1)] =	**9,044**	**ft^3**
k_{SAT},measured (per geotechnical report)=	11.6	in/hr
Factor of Safety (FS) =	3	
k_{SAT},design = k_{SAT},measured /FS =	3.87	in/hr
Drawdown Time (T) =	96	hr
k_{SAT} (ft/s)=	**8.95062E-05**	**ft/s**
Amin = (Vm*12 in/ft)/(T*ksat,design) =	**292**	**ft^2**
Adrywell =(Depth of Infiltration*CircumferenceRock + $AreaRock_{Bottom}$)	**971**	**ft^2**
Design rate with Infiltration area for flow (disposal) rate (ksat*Adrywell)	**0.0869**	**ft^3/s**
Volume disposal rates:		
$V_{96\text{-}hr}$: k_{SAT}*96hrs*3600s/hr	30029	ft^3
$V_{3\text{-}hr}$: k_{SAT}*3hrs*3600s/hr	**938**	**ft^3**
V_{WELL} = (Sc*$Area_{CHAMBER}$+Hg*AreaRock*40%)	**691**	**ft^3**
Drywells Required	**1**	
$V_{WELL\ TOTAL}$= V_{WELL} * #Wells =	**691**	**ft^3**
$V_{3\text{-}hr\ TOTAL}$= $V_{3\text{-}hr}$ * #Wells =	**938**	**ft^3**
Pre-Treatment Height	**15**	**ft**
$V_{PRE\text{-}TREATMENT}$=	**282**	**ft^3**
$V_{DRYWELL\ SYSTEM}$ = $V_{WELL\ TOTAL}$ + $V_{3\text{-}HR\ TOTAL}$ + $V_{PRE\text{-}TREATMENT}$ =	**1911**	**ft^3**
Volume storage chamber required= V_m - $V_{DRYWELL}$=	**7,133**	**ft^3**





016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

N W E S

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

LOS ANGELES
50-YEAR 24-HOUR ISOHYET

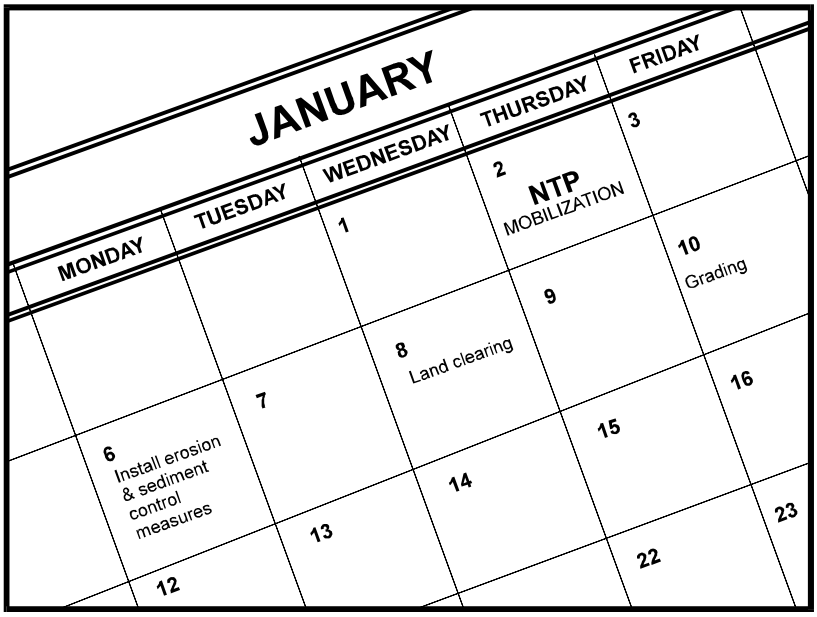
1-H1.19

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Scheduling

Figure 8: TYPICAL SWPPP BMPS

EC-1



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 Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

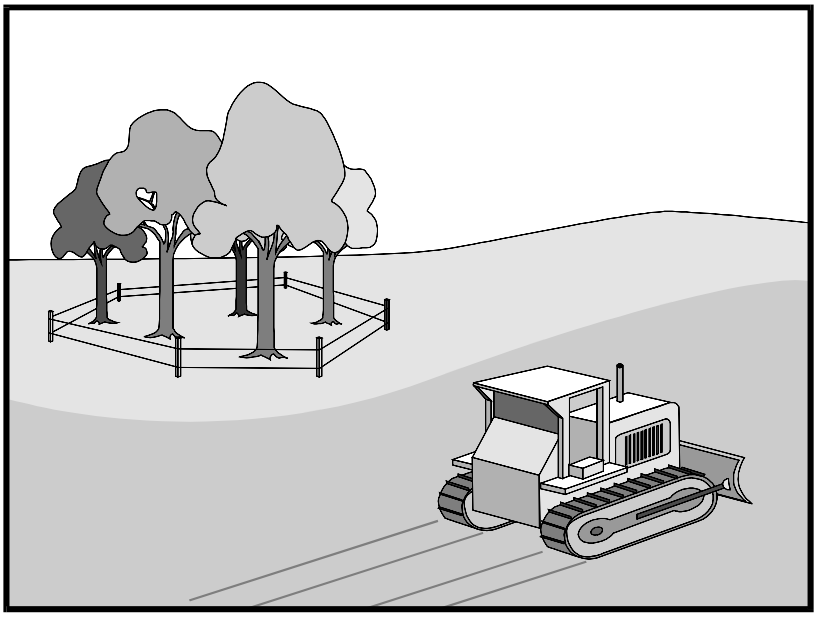
Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates

Preservation Of Existing Vegetation EC-2



Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs, or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.

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 Objective**

☒ **Secondary Objective**

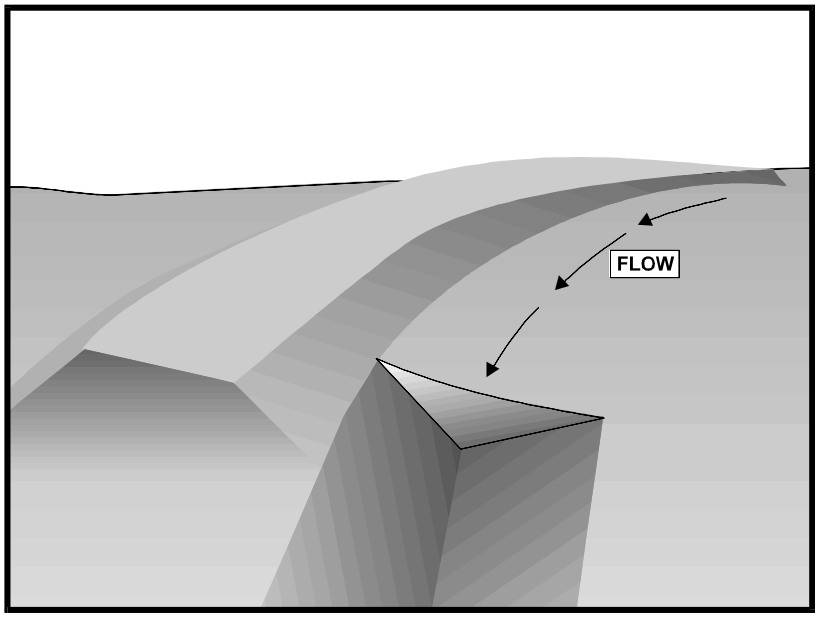
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Earth Dikes and Drainage Swales EC-9



Description and Purpose

An earth dike is a temporary berm or ridge of compacted soil used to divert runoff or channel water to a desired location. A drainage swale is a shaped and sloped depression in the soil surface used to convey runoff to a desired location. Earth dikes and drainage swales are used to divert off site runoff around the construction site, divert runoff from stabilized areas and disturbed areas, and direct runoff into sediment basins or traps.

Suitable Applications

Earth dikes and drainage swales are suitable for use, individually or together, where runoff needs to be diverted from one area and conveyed to another.

- Earth dikes and drainage swales may be used:
  - To convey surface runoff down sloping land
  - To intercept and divert runoff to avoid sheet flow over sloped surfaces
  - To divert and direct runoff towards a stabilized watercourse, drainage pipe or channel
  - To intercept runoff from paved surfaces
  - Below steep grades where runoff begins to concentrate
  - Along roadways and facility improvements subject to flood drainage

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 Objective**

☒ **Secondary Objective**

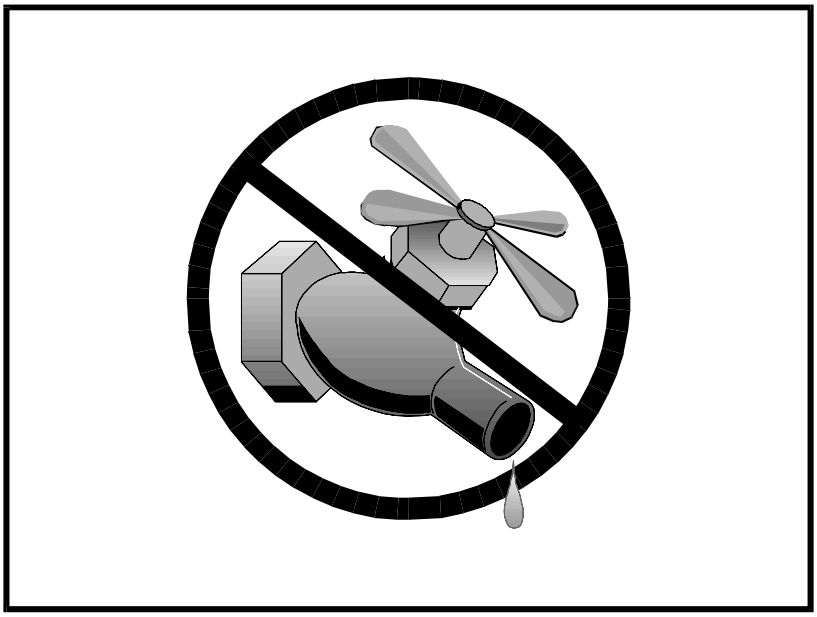
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Water Conservation Practices NS-1



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 Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

Limitations

- None identified.

Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.

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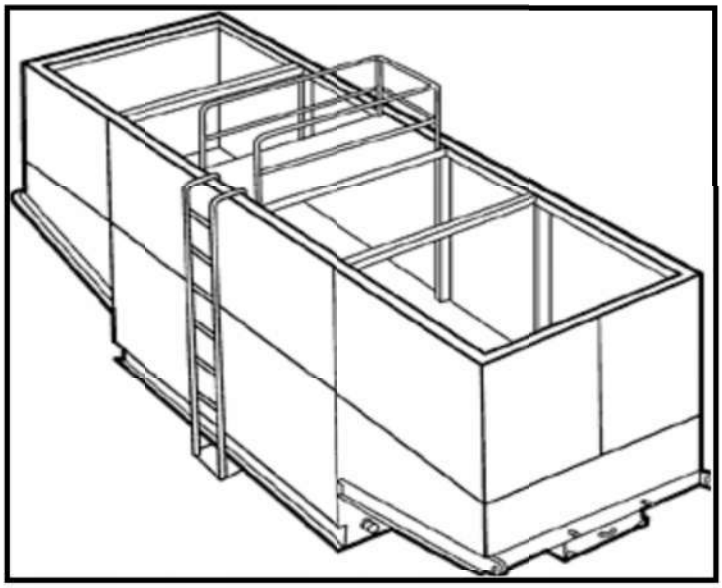
Dewatering Operations NS-2



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

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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.

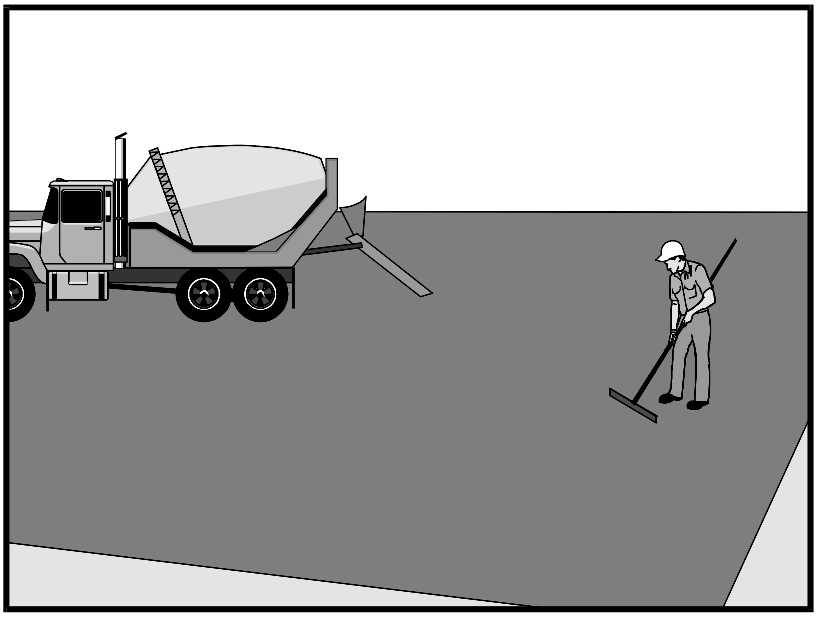
The dewatering operations described in this fact sheet are not Active Treatment Systems (ATS) and do not include the use of chemical coagulations, chemical flocculation or electrocoagulation.

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

Paving and Grinding Operations NS-3



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

None

Description and Purpose

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

The General Permit incorporates Numeric Action Levels (NAL) for pH and turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials associated with paving and grinding operations, including mortar, concrete, and cement and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

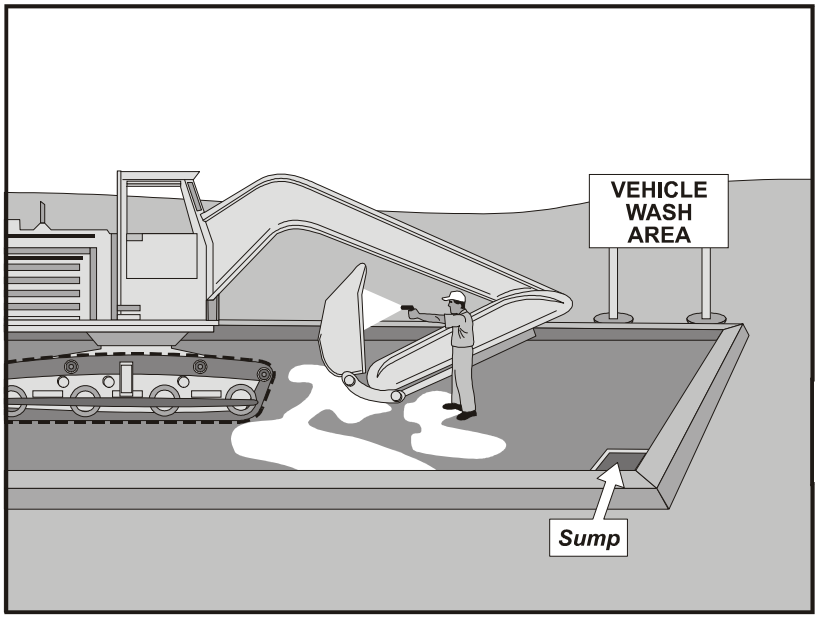
These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Paving opportunities may be limited during wet weather.

  Discharges of freshly paved surfaces may raise pH to environmentally harmful levels and trigger permit violations.

Vehicle and Equipment Cleaning NS-8



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 Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

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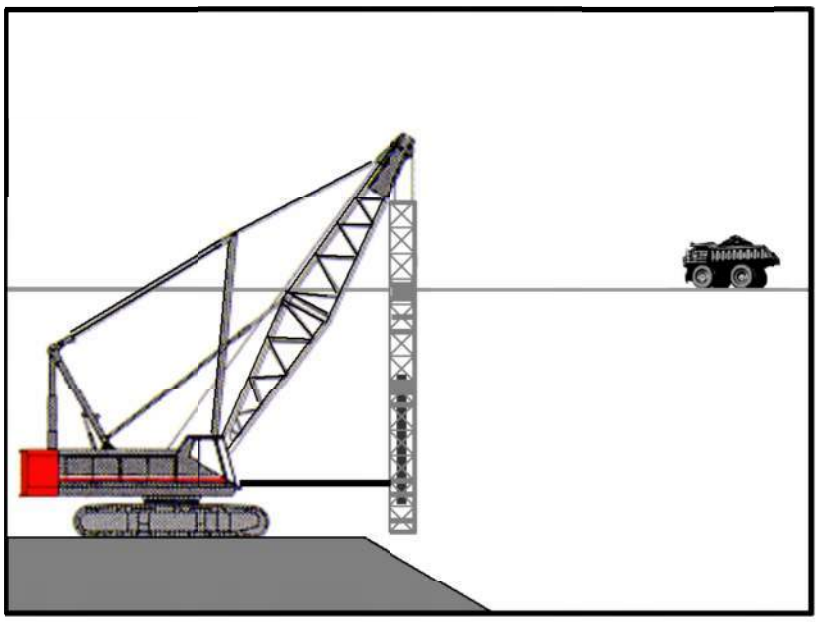
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Pile Driving Operations NS-11



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 Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

The construction and retrofit of bridges and retaining walls often include driving piles for foundation support and shoring operations. Driven piles are typically constructed of precast concrete, steel, or timber. Driven sheet piles are also used for shoring and cofferdam construction. Proper control and use of equipment, materials, and waste products from pile driving operations will reduce or eliminate the discharge of potential pollutants to the storm drain system, watercourses, and waters of the United States.

Suitable Applications

These procedures apply to all construction sites near or adjacent to a watercourse or groundwater where permanent and temporary pile driving (impact and vibratory) takes place, including operations using pile shells as well as construction of cast-in-steel-shell and cast-in-drilled-hole piles.

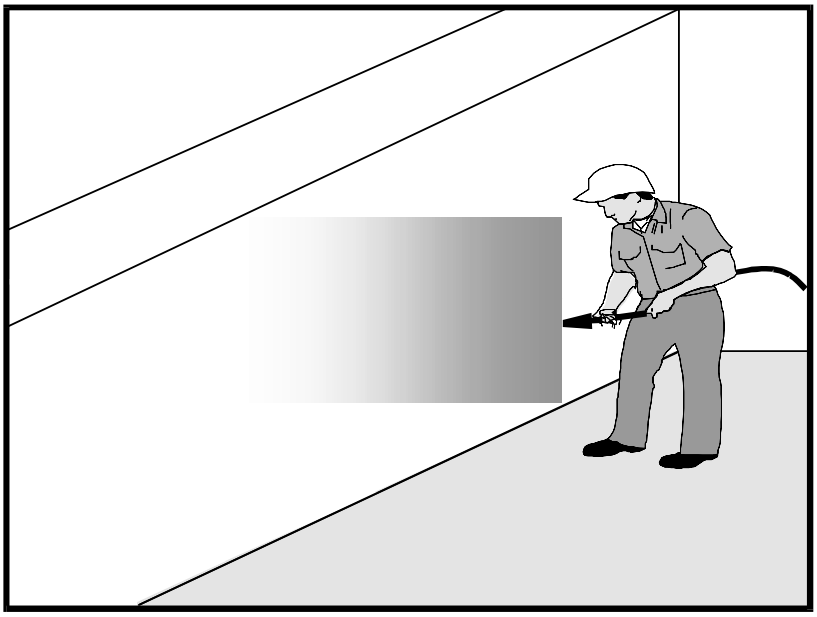
Limitations

None identified.

Implementation

- Use drip pans or absorbent pads during vehicle and equipment operation, maintenance, cleaning, fueling, and storage. Refer to NS-8, Vehicle and Equipment Cleaning, NS-9, Vehicle and Equipment Fueling, and NS-10, Vehicle and Equipment Maintenance.

Concrete Curing NS-12



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

None

Description and Purpose

Concrete curing is used in the construction of structures such as bridges, retaining walls, pump houses, large slabs, and structured foundations. Concrete curing includes the use of both chemical and water methods.

Concrete and its associated curing materials have basic chemical properties that can raise the pH of water to levels outside of the permitted range. Discharges of stormwater and non-stormwater exposed to concrete during curing may have a high pH and may contain chemicals, metals, and fines. The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Proper procedures and care should be taken when managing concrete curing materials to prevent them from coming into contact with stormwater flows, which could result in a high pH discharge.

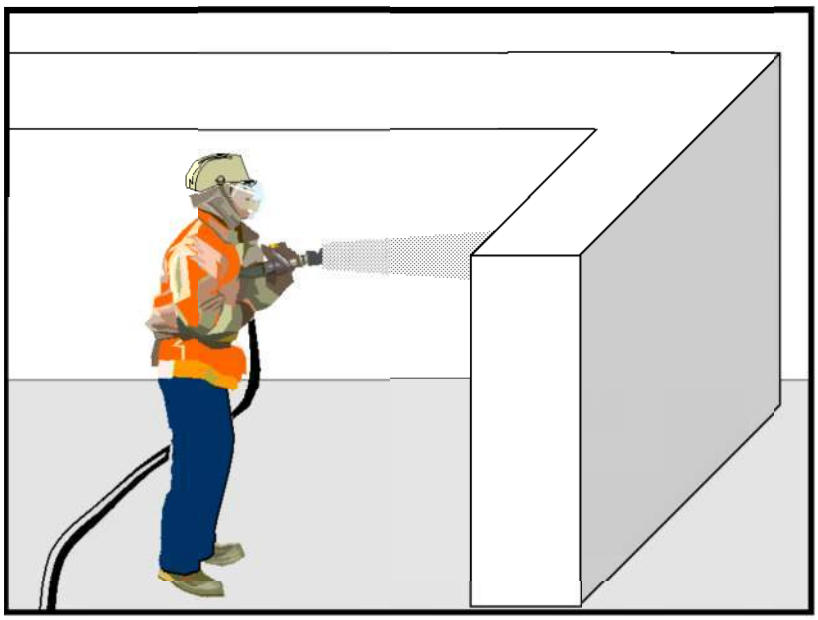
Suitable Applications

Suitable applications include all projects where Portland Cement Concrete (PCC) and concrete curing chemicals are placed where they can be exposed to rainfall, runoff from other areas, or where runoff from the PCC will leave the site.

Limitations

- Runoff contact with concrete waste can raise pH levels in the water to environmentally harmful levels and trigger permit violations.

Concrete Finishing NS-13



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

None

Description and Purpose

Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high pressure water blasting. Stormwater and non-stormwater exposed to concrete finishing by-products may have a high pH and may contain chemicals, metals, and fines. Proper procedures and implementation of appropriate BMPs can minimize the impact that concrete-finishing methods may have on stormwater and non-stormwater discharges.

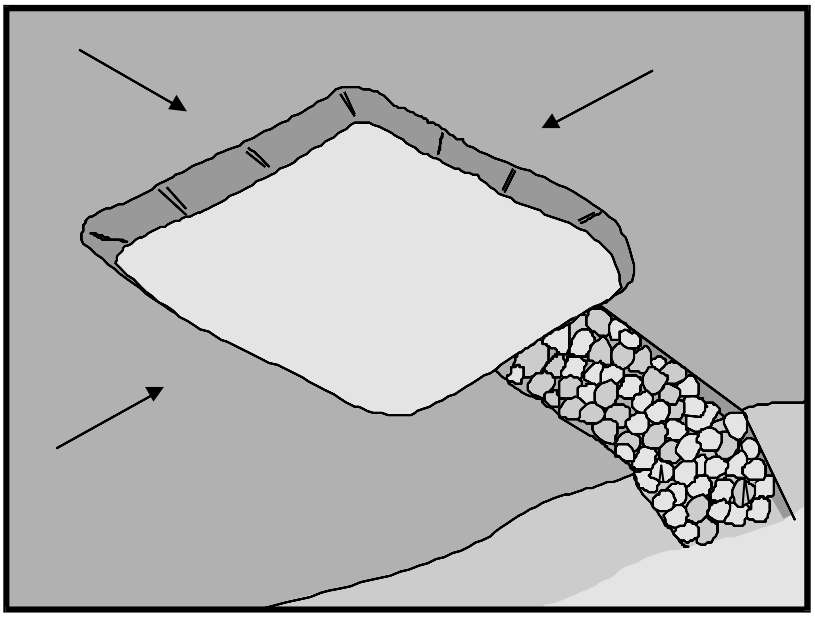
The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Concrete and its associated curing materials have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

These procedures apply to all construction locations where concrete finishing operations are performed.

Sediment Trap SE-3



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 Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-2 Sediment Basin (for larger areas)

Description and Purpose

A sediment trap is a containment area where sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out or before the runoff is discharged by gravity flow. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area.

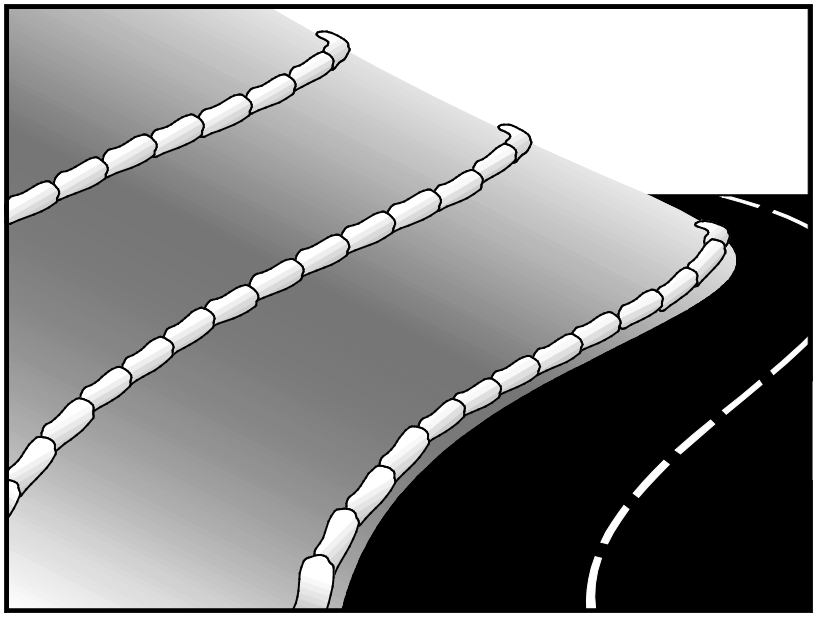
Trap design guidance provided in this fact sheet is not intended to guarantee compliance with numeric discharge limits (numeric action levels or numeric effluent limits for turbidity). Compliance with discharge limits requires a thoughtful approach to comprehensive BMP planning, implementation, and maintenance. Therefore, optimally designed and maintained sediment traps should be used in conjunction with a comprehensive system of BMPs.

Suitable Applications

Sediment traps should be considered for use:

- At the perimeter of the site at locations where sediment-laden runoff is discharged offsite.
- At multiple locations within the project site where sediment control is needed.
- Around or upslope from storm drain inlet protection measures.
- Sediment traps may be used on construction projects where the drainage area is less than 5 acres. Traps would be

Gravel Bag Berm SE-6



Description and Purpose

A gravel bag berm is a series of gravel-filled bags placed on a level contour to intercept sheet flows. Gravel bags pond sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flow, preventing erosion.

Suitable Applications

Gravel bag berms may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As a linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.

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-1 Silt Fence

SE-5 Fiber Roll

SE-8 Sandbag Barrier

SE-12 Temporary Silt Dike

SE-14 Biofilter Bags

Street Sweeping and Vacuuming SE-7

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 Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.

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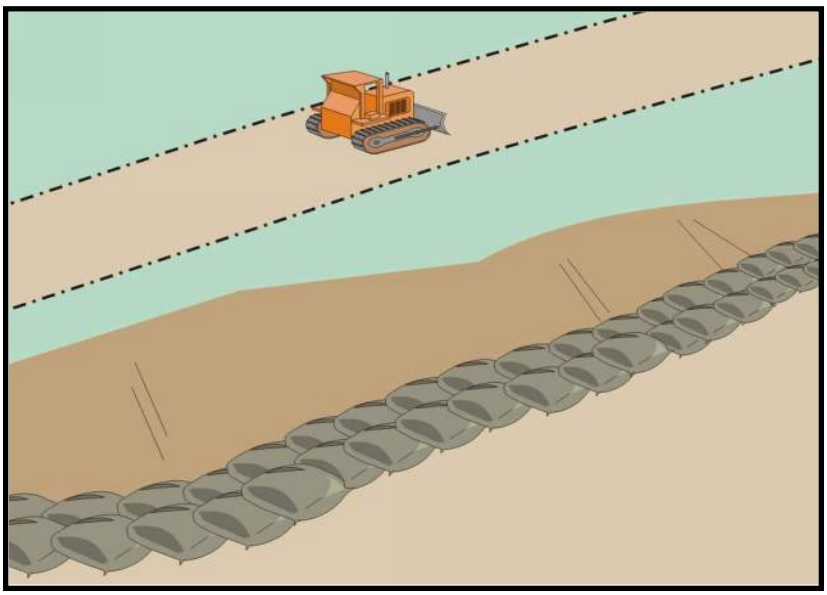
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Sandbag Barrier SE-8



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**

Description and Purpose

A sandbag barrier is a series of sand-filled bags placed on a level contour to intercept or to divert sheet flows. Sandbag barriers placed on a level contour pond sheet flow runoff, allowing sediment to settle out.

Suitable Applications

Sandbag barriers may be a suitable control measure for the applications described below. It is important to consider that sand bags are less porous than gravel bags and ponding or flooding can occur behind the barrier. Also, sand is easily transported by runoff if bags are damaged or ruptured. The SWPPP Preparer should select the location of a sandbag barrier with respect to the potential for flooding, damage, and the ability to maintain the BMP.

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes.
  - As sediment traps at culvert/pipe outlets.
  - Below other small cleared areas.
  - Along the perimeter of a site.
  - Down slope of exposed soil areas.
  - Around temporary stockpiles and spoil areas.
  - Parallel to a roadway to keep sediment off paved areas.
  - Along streams and channels.

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

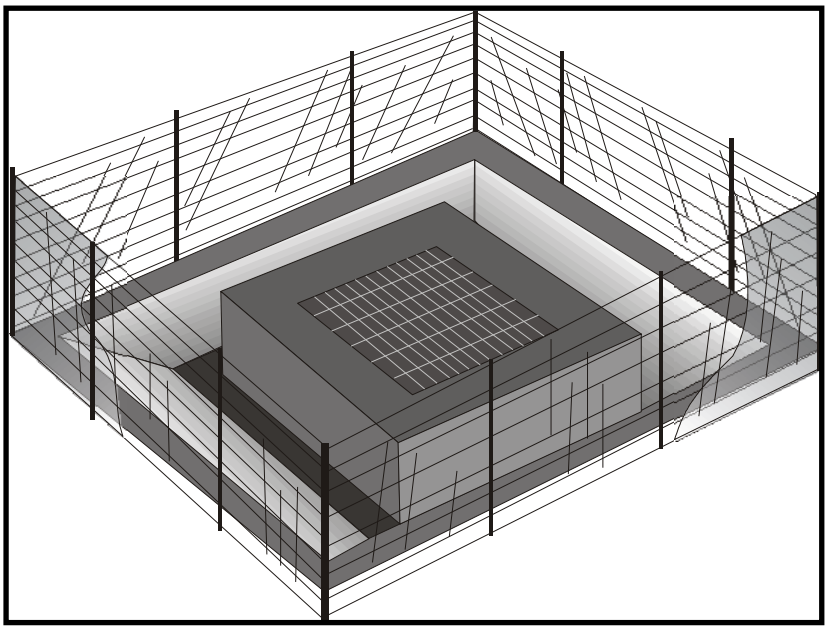
SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-12 Manufactured Linear Sediment Controls

SE-14 Biofilter Bags

Storm Drain Inlet Protection SE-10



Description and Purpose

Storm drain inlet protection consists of a sediment filter or an impounding area in, around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction. Temporary geotextile storm drain inserts attach underneath storm drain grates to capture and filter storm water.

Suitable Applications

- Every storm drain inlet receiving runoff from unstabilized or otherwise active work areas should be protected. Inlet protection should be used in conjunction with other erosion and sediment controls to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.

Limitations

- Drainage area should not exceed 1 acre.
- In general straw bales should not be used as inlet protection.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.
- Sediment removal may be inadequate to prevent sediment discharges in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are expected, use

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-1 Silt Fence

SE-5 Fiber Rolls

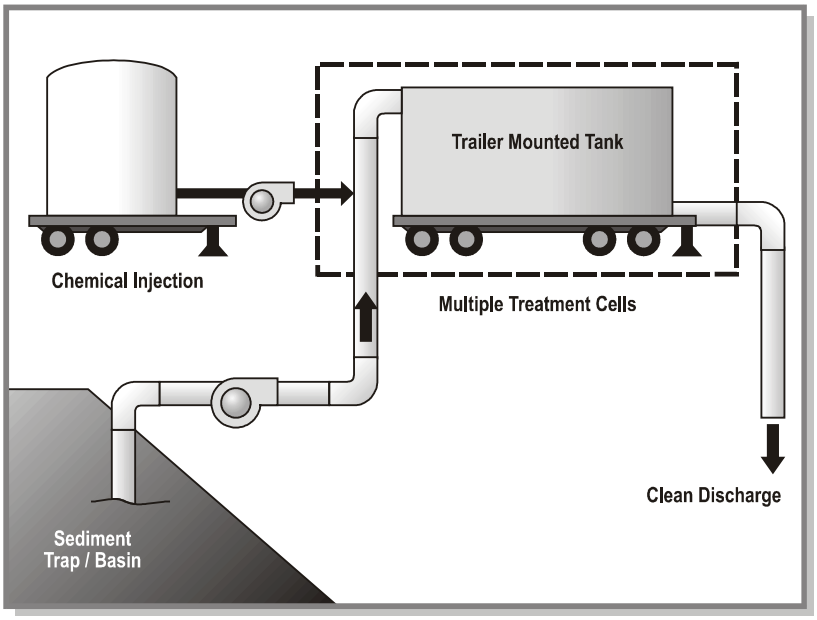
SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-14 Biofilter Bags

SE-13 Compost Socks and Berms

Active Treatment Systems SE-11



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

None

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Description and Purpose

Active Treatment Systems (ATS) reduce turbidity of construction site runoff by introducing chemicals to stormwater through direct dosing or an electrical current to enhance flocculation, coagulation, and settling of the suspended sediment. Coagulants and flocculants are used to enhance settling and removal of suspended sediments and generally include inorganic salts and polymers (USACE, 2001). The increased flocculation aids in sedimentation and ability to remove fine suspended sediments, thus reducing stormwater runoff turbidity and improving water quality.

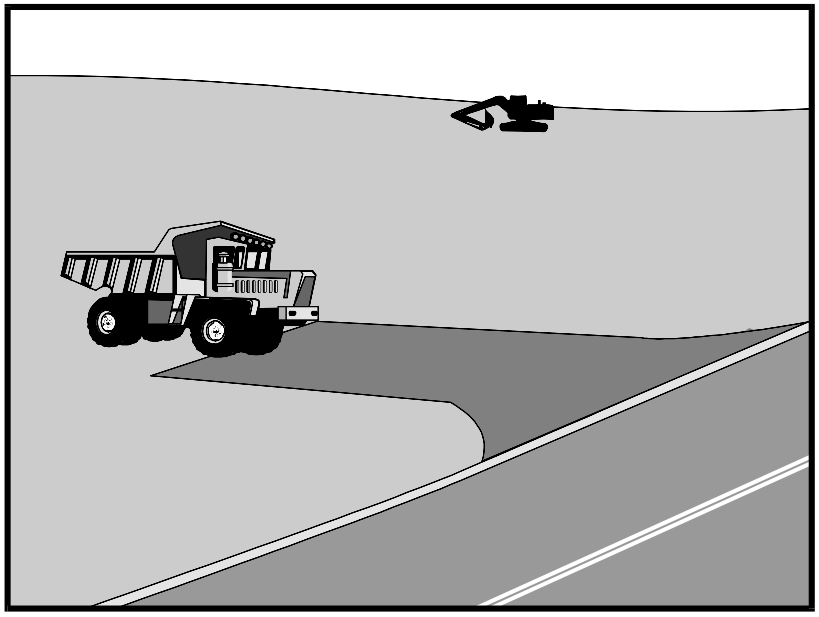
Suitable Applications

ATS can reliably provide exceptional reductions of turbidity and associated pollutants and should be considered where turbid discharges to sediment and turbidity sensitive waters cannot be avoided using traditional BMPs. 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.

Limitations

Dischargers choosing to utilize chemical treatment in an ATS must follow all guidelines of the Construction General Permit Attachment F – Active Treatment System Requirements. General limitations are as follows:

Stabilized Construction Entrance/Exit TC-1



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 Objective**
☒ **Secondary Objective**

Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

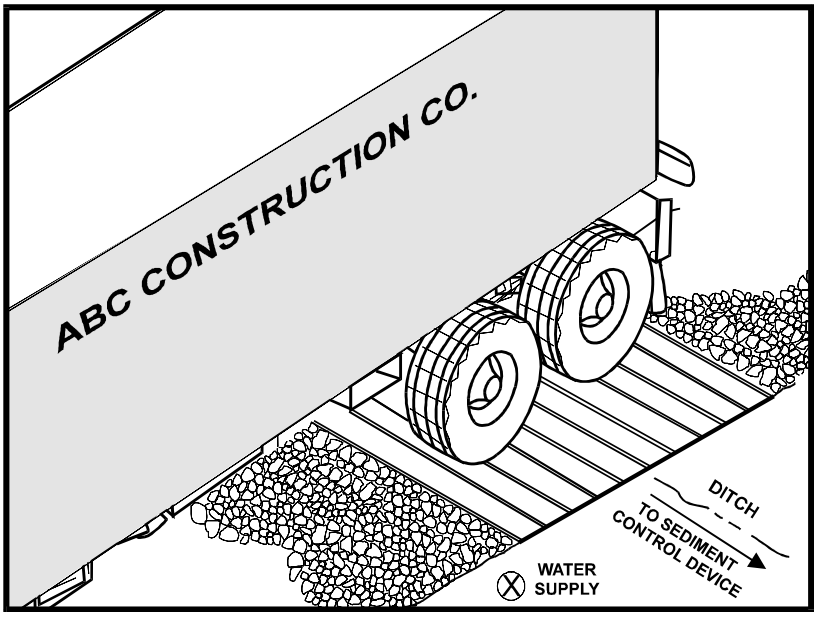
- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Entrance/Outlet Tire Wash TC-3



Description and Purpose

A tire wash is an area located at stabilized construction access points to remove sediment from tires and under carriages and to prevent sediment from being transported onto public roadways.

Suitable Applications

Tire washes may be used on construction sites where dirt and mud tracking onto public roads by construction vehicles may occur.

Limitations

- The tire wash requires a supply of wash water.
- A turnout or doublewide exit is required to avoid having entering vehicles drive through the wash area.
- Do not use where wet tire trucks leaving the site leave the road dangerously slick.

Implementation

- Incorporate with a stabilized construction entrance/exit. See TC-1, Stabilized Construction Entrance/Exit.
- Construct on level ground when possible, on a pad of coarse aggregate greater than 3 in. but smaller than 6 in. A geotextile fabric should be placed below the aggregate.
- Wash rack should be designed and constructed/manufactured for anticipated traffic loads.

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 Objective**

☒ **Secondary Objective**

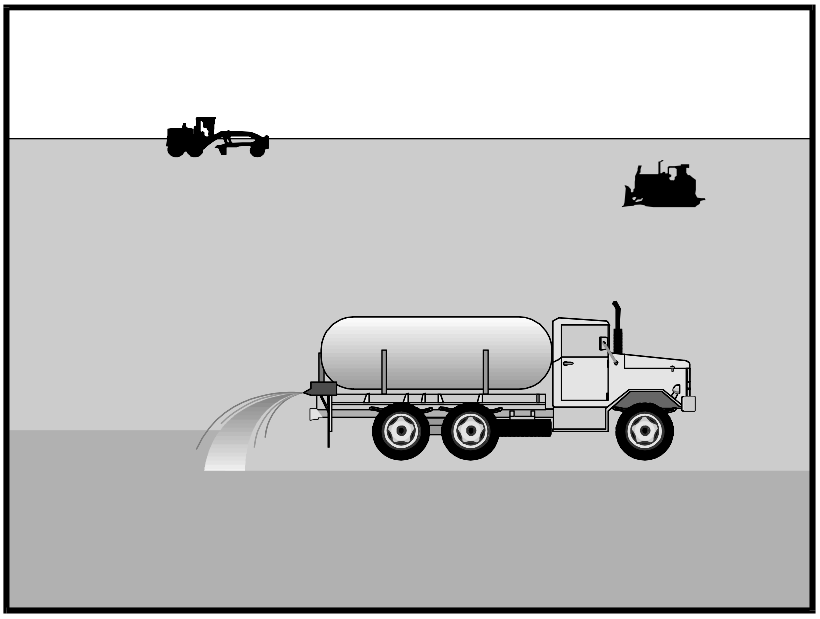
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

TC-1 Stabilized Construction Entrance/Exit

Wind Erosion Control WE-1



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

EC-5 Soil Binders

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Description and Purpose

Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

California's Mediterranean climate, with a short "wet" season and a typically long, hot "dry" season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

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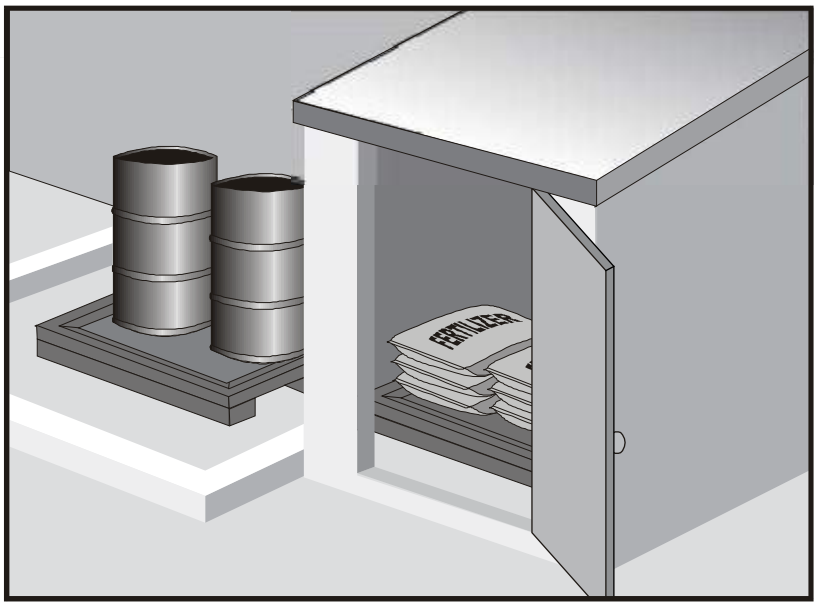
Material Delivery and Storage WM-1



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**

Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

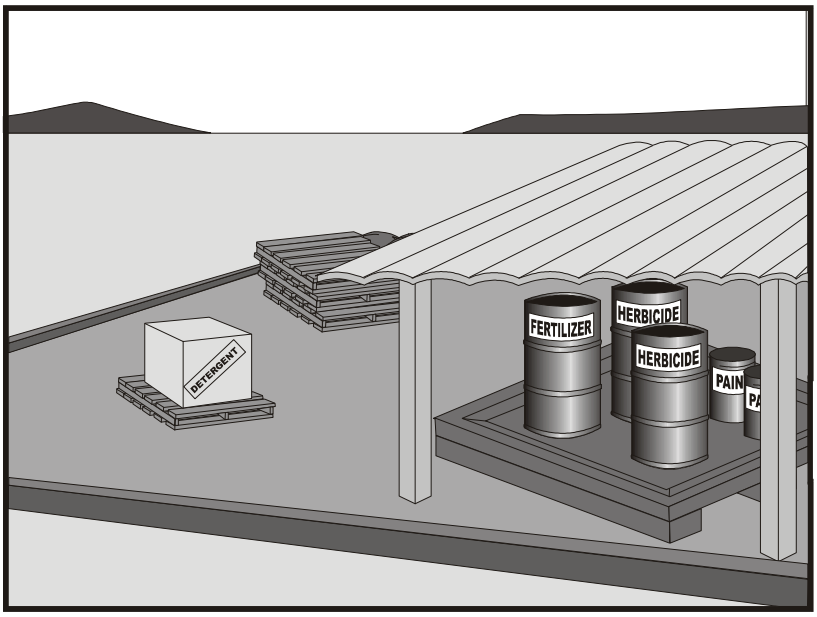
- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Material Use WM-2



Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment

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**

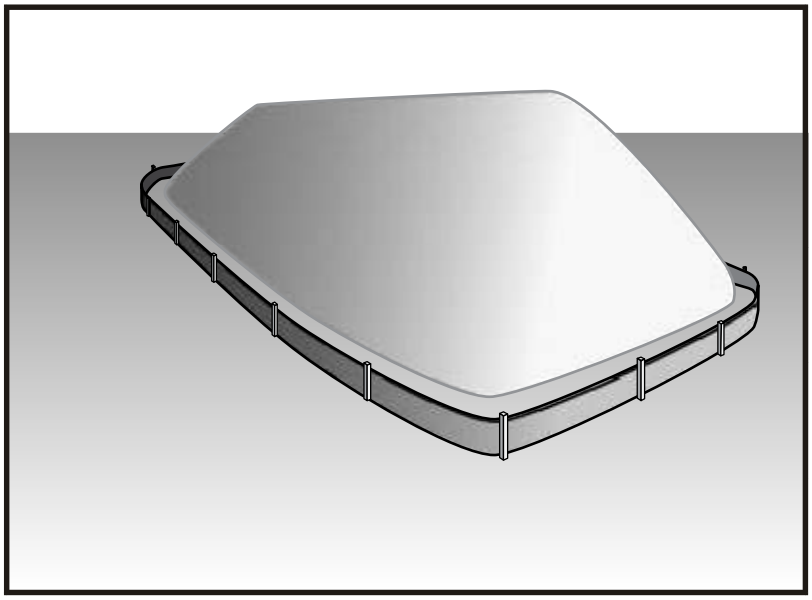
Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Stockpile Management WM-3



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**

Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other loose materials.

Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of Plastic materials and photodegradable plastics should be avoided.

Implementation

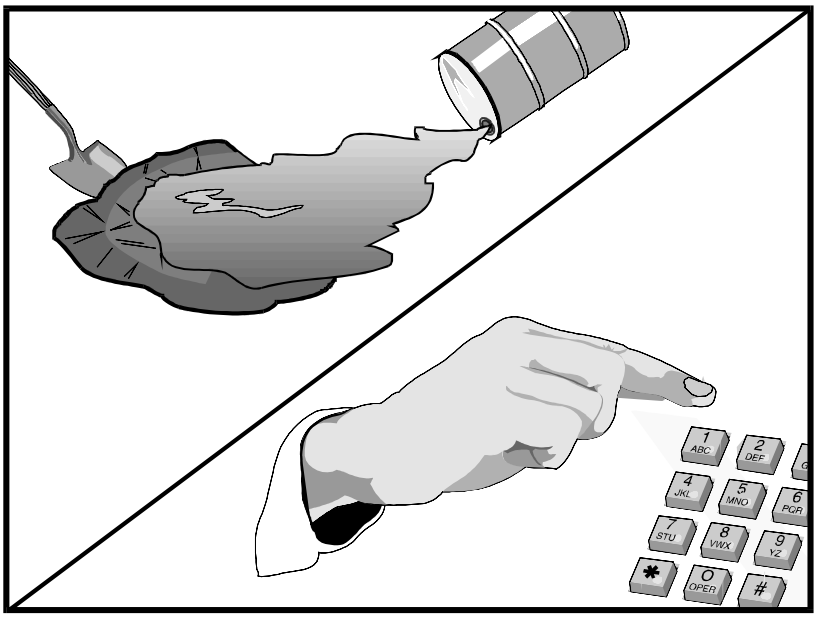
Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Spill Prevention and Control WM-4



Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

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 Objective**

☒ **Secondary Objective**

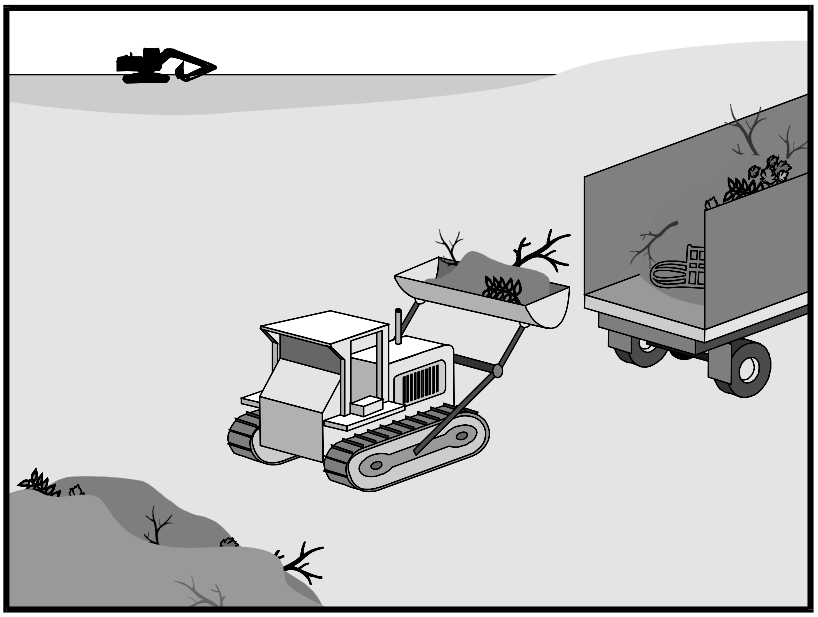
Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Solid Waste Management WM-5



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 Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

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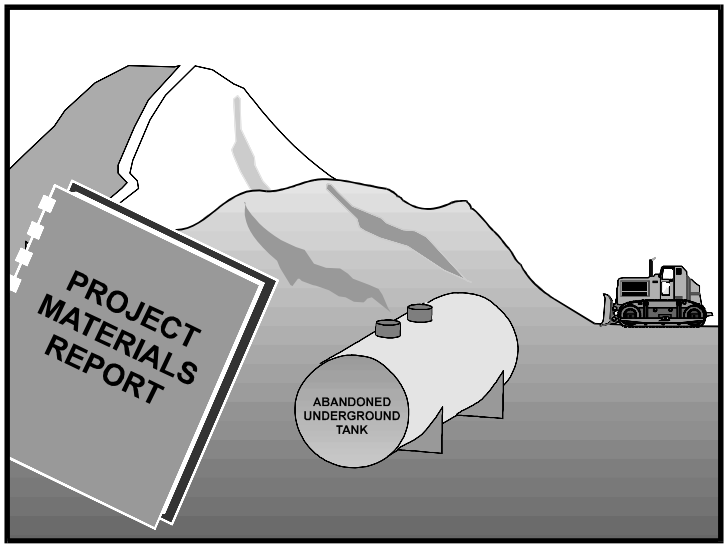
Contaminated Soil Management WM-7



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 Objective**
☒ **Secondary Objective**

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

Suitable Applications

Contaminated soil management is implemented on construction projects in highly urbanized or industrial areas where soil contamination may have occurred due to spills, illicit discharges, aerial deposition, past use and leaks from underground storage tanks.

Limitations

Contaminated soils that cannot be treated onsite must be disposed of offsite by a licensed hazardous waste hauler. The presence of contaminated soil may indicate contaminated water as well. See NS-2, Dewatering Operations, for more information.

The procedures and practices presented in this BMP are general. The contractor should identify appropriate practices and procedures for the specific contaminants known to exist or discovered onsite.

Implementation

Most owners and developers conduct pre-construction environmental assessments as a matter of routine. Contaminated soils are often identified during project planning and development with known locations identified in the plans, specifications and in the SWPPP. The contractor should review applicable reports and investigate appropriate call-outs in the

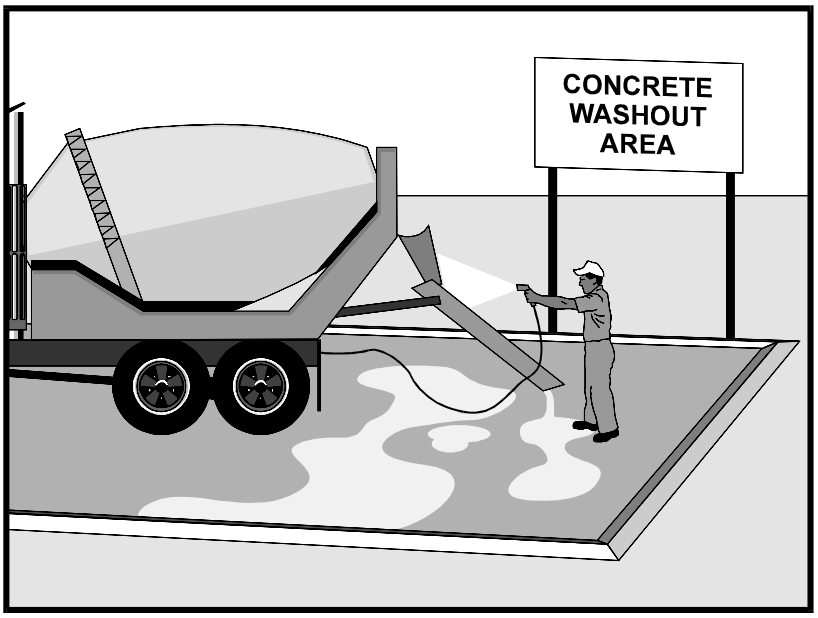
Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Concrete Waste Management WM-8



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

None

Description and Purpose

Prevent the discharge of pollutants to stormwater from concrete waste by conducting washout onsite or offsite in a designated area, and by employee and subcontractor training.

The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

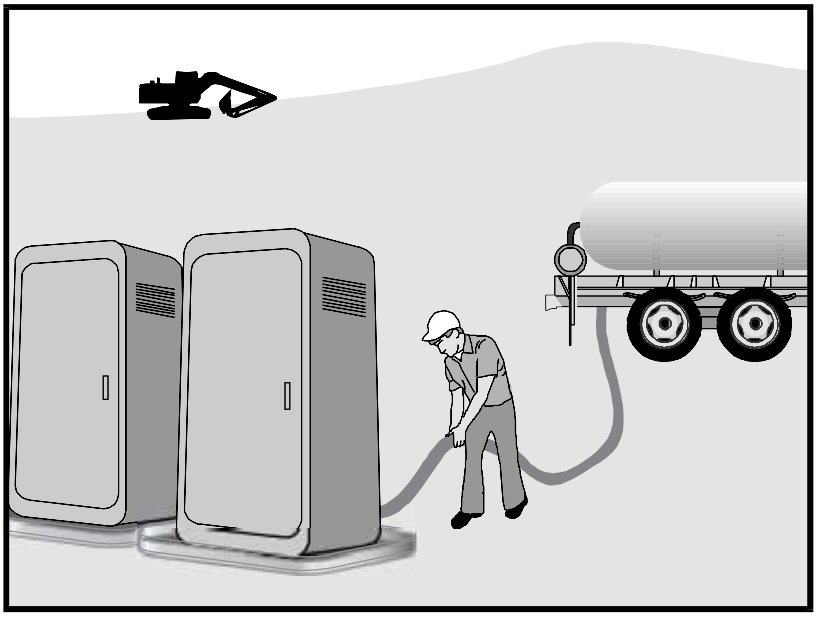
Many types of construction materials, including mortar, concrete, stucco, cement and block and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows and raising pH to levels outside the accepted range.

Suitable Applications

Concrete waste management procedures and practices are implemented on construction projects where:

- Concrete is used as a construction material or where concrete dust and debris result from demolition activities.
- Slurries containing portland cement concrete (PCC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition.
- Concrete trucks and other concrete-coated equipment are washed onsite.

Sanitary/Septic Waste Management WM-9



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

None

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Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

Limitations

None identified.

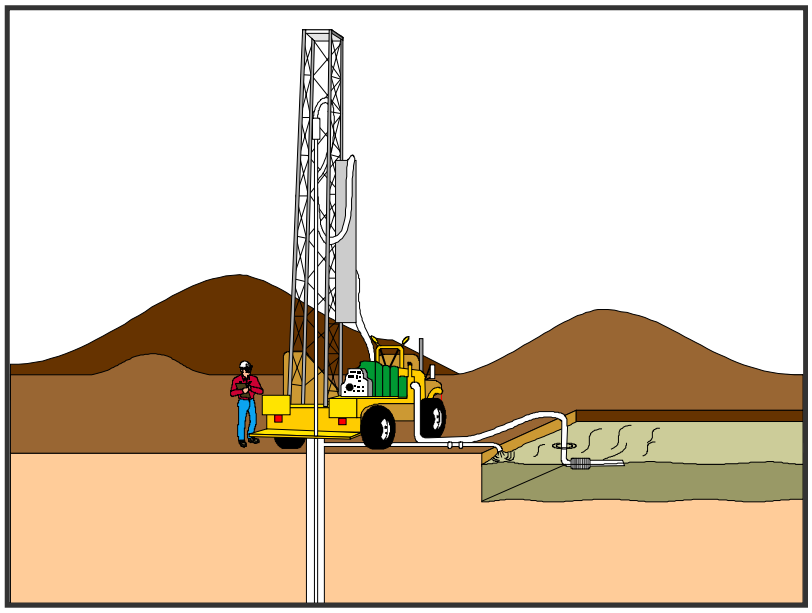
Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. If site conditions allow, place portable facilities a minimum of 50 feet from drainage conveyances and traffic areas. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.

Liquid Waste Management WM-10



Description and Purpose

Liquid waste management includes procedures and practices to prevent discharge of pollutants to the storm drain system or to watercourses as a result of the creation, collection, and disposal of non-hazardous liquid wastes.

Suitable Applications

Liquid waste management is applicable to construction projects that generate any of the following non-hazardous by-products, residuals, or wastes:

- Drilling slurries and drilling fluids
- Grease-free and oil-free wastewater and rinse water
- Dredgings
- Other non-stormwater liquid discharges not permitted by separate permits

Limitations

- Disposal of some liquid wastes may be subject to specific laws and regulations or to requirements of other permits secured for the construction project (e.g., NPDES permits, Army Corps permits, Coastal Commission permits, etc.).
- Liquid waste management does not apply to dewatering operations (NS-2 Dewatering Operations), solid waste management (WM-5, Solid Waste Management), hazardous wastes (WM-6, Hazardous Waste Management), or

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 Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None