Appendix IS-2

Hydrology Report

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DISTRICT NOHO

WATER RESOURCES TECHNICAL REPORT

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1. INTRODUCTION

1.1. PROJECT DESCRIPTION

NoHo Development Associates, LLC proposes the development of approximately 15.9 acres of land owned by the Los Angeles County Metropolitan Transportation Authority (Metro) at and including the terminus of Metro's Red Line and Orange Line (Project Site) as part of a joint development effort with Metro. The overall vision is a high-intensity, transit-oriented development with a mix of uses that includes market rate and affordable multi-family residential units, community-serving retail and restaurant uses, and office space that is integrated with bicycle, bus, rail, and parking facilities (collectively, the Project).[1] The Project is designed in conformance with Metro's North Hollywood Guide for Development and intended to be promote the goals of the City's future G (Orange) Line Transit Neighborhood Plan, which includes the North Hollywood Station. The Project is anticipated to be constructed in multiple phases over a period of approximately 15 years, with full buildout anticipated in 2037.

The Project would revitalize and expand transit facilities at Metro's North Hollywood Station, including the Metro Red Line portal entry, bus terminal for the Metro Orange Line, the Los Angeles Department of Transportation (LADOT) Commuter Express, and local/regional buses with integration of retail uses within the historic Lankershim Depot. Surrounding these transit improvements would be the development of: 1,523,528 square feet of residential uses comprised of 1,216 market rate units and 311 affordable residential units representing 20 percent of the total proposed residential density; 105,125 square feet of retail/restaurant uses; and up to approximately 580,374[2] square feet for office uses. New buildings would range from one story to 28 stories in height. The Project would also include approximately 297,925 square feet of open space with extensive amenities located throughout the Project Site. The proposed uses would be supported by up to 3,313 vehicle parking spaces and up to 1,167 bicycle parking spaces for Project uses. Up to 274 vehicle parking spaces for Metro uses in both on- and off-site locations and up to 166 Metro Bike Hub bicycle parking spaces would also be included as part of the Project.[3] Project parking

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[1] The analysis includes off-site Metro parking areas located at the southwest corner of N. Chandler Boulevard and Tujunga Avenue and on the north side of Chandler Boulevard between Fair Avenue and Vineland Avenue. These parking areas are not part of the District NoHo Project and related entitlements, but would be developed in support of the Project and separately permitted by Metro relying upon this Initial Study and EIR. The off-site parking areas are however considered part of the Project Site for purposes of this analysis.

[2] This total includes 87,300 square feet of floor area, which could be created through the conversion of portions of four levels of parking structure on Block 8 to office uses. While this floor area is not reflected in the present design of Block 8, because the parking structure on that block is designed to be convertible to habitable uses and in order to provide the most conservative analysis reflecting an eventual conversion of that parking area to office uses, the Initial Study and EIR includes this office floor area throughout its analysis.

[3] The Project is required to provide up to 750 replacement parking spaces for Metro users. These replacement parking spaces could be provided entirely off-site or in some combination of up to 274 spaces within the Project Site and the balance within off-site locations. The plan set submitted with the Project's application assumes up to 274 spaces for Metro users would be included within the Project Site, but this is subject to change pending the final design of the off-site Metro parking facilities. To allow for the most conservative analysis, the

would be provided in both subterranean and above-grade structures, as well as within surface lots. The prominent component of the Project would be the creation of a public transit and event plaza with retail, food, and beverage uses that create a new public amenity and community gathering place for North Hollywood. Additionally, as part of the Project, certain surplus City rights-of-way are proposed to be merged into the Project Site which, if approved, would bring the total lot area to 16.07 acres. Overall, at buildout, the Project would remove 49,111 square feet of existing floor area and construct 2,209,027 square feet of new floor area, resulting in a net increase of 2,159,916 square feet of new floor area within the Project Site.

1.2. Scope of Work

This report provides a description of the existing surface water hydrology, surface water quality, groundwater level, and groundwater quality at the Project Site. In addition, the Report includes an analysis of the Project's potential significance related to the impact on surface water hydrology, surface water quality, groundwater level and groundwater quality.

2. REGULATORY FRAMEWORK

2.1. Surface Water Hydrology

County of Los Angeles Hydrology Manual

Per the City of Los Angeles (City)'s Special Order No. 007-1299, December 3, 1999, the City has adopted the Los Angeles County (County) Department of Public Works Hydrology Manual as its basis of design for storm drainage facilities. The Hydrology Manual requires that a storm drain conveyance system be designed for a 25-year storm event and that the combined capacity of a storm drain and street flow system accommodate flow from a 50-year storm event. Areas with sump conditions are required to have a storm drain conveyance system capable of conveying flow from a 50-year storm event.[4] The County also limits the allowable discharge into existing storm drain facilities based on the municipal separate storm sewer system (MS4) Permit and is enforced on 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 requires the approval/review from the County Flood Control District department.

CEQA analysis will assume 274 Metro replacement parking spaces within the Project Site, as well as 750 replacement spaces within off-site locations.

4 Los Angeles County Department of Public Works Hydrology Manual, January 2006, http://ladpw.org/wrd/publication/index.cfm, accessed September 6, 2019.

Los Angeles Municipal Code

Any proposed drainage improvements within the street right of way or any other property owned by, to be owned by, or under the control of the City requires the approval of a B-permit (Section 62.105, 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 property line to a catch basin or a storm drain pipe requires a storm drain 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 was first introduced in 1948 as the Water Pollution Control 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.[5]

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.

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5 Non-point sources of pollution are carried through the environment via elements such as wind, rain, or stormwater and are generated by diffuse land use activities (such as runoff from streets and sidewalks or agricultural activities) rather than from an identifiable or discrete facility.

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,[6] (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 USEPA 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. [7]

Federal Anti-Degradation Policy

The Federal Antidegradation Policy (40 Code of Federal Regulations 131.12) requires states to develop statewide antidegradation policies and identify methods for implementing them. Pursuant to the Code of Federal Regulations (CFR), state antidegradation 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

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[6] A small municipal separate storm sewer system (MS4) is any MS4 not already covered by the Phase I program as a medium or large MS4. The Phase II Rule automatically covers on a nationwide basis all small MS4s located in "urbanized areas" as defined by the Bureau of the Census (unless waived by the NPDES permitting authority), and on a case-by-case basis those small MS4s located outside of urbanized areas that the NPDES permitting authority designates.

[7] USEPA.U.S. Environmental Protection Agency - Clean Water Act. July 2011. https://www.epa.gov/laws-regulations/summary-clean-water-act; accessed September 2019.

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.

As discussed above, 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 (LARWQCB).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 Antidegradation 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 Antidegradation Policy, the California Antidegradation 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 Toxics Rule

In 2000, the EPA promulgated the California Toxics Rule, which establishes water quality criteria for certain toxic substances to be applied to waters in the State. The USEPA promulgated this rule based on their determination that the numeric criteria are necessary in the State to protect human health and the environment. The California Toxics 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 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 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 antidegradation 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.[8]

The Basin Plan is a resource for the RWQCB 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.

Construction General Permit

SWRCB Order No. 2009-0009-DWQ known as the "Construction General Permit" was adopted on September 2, 2009.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 Construction 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

[8] Los Angeles Regional Water Quality Control Board. LARWQCB Basin Plan. https://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/index.html; accessed September 2019.

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

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

California mandates requirements for 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 for a specific construction project, charging Owners with stormwater quality management responsibilities. A construction site subject to the Construction General Permit must prepare and implement a SWPPP that meets the requirements of the Construction General Permit.[9,10]

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 Los Angeles County MS4 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:

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9 State Water Resources Control Board.State Water Resources Control Board. July 2012, http://www.swrcb.ca.gov/water_issues/programs/npdes/; accessed September 6, 2019.

10 USEPA.U.S. Environmental Protection Agency - NPDES. July 2012, https://www.epa.gov/npdes

- Implement a public information and participation program to conduct outreach on stormwater 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 stormwater 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 MS4 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 stormwater 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 (TMDL)s 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 stormwater 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 WMCs 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-stormwater discharges to the storm drain system including discharge to the MS4 from various development types.

City of Los Angeles Water Quality Compliance Master Plan for Urban Runoff

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 Construction General Permit through the *Development Best Management Practices Handbook, Part A Construction Activities,* 3rd Edition, and associated ordinances which the City of Los Angeles adopted in September 2004.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 Construction General Permit.

The City of Los Angeles supports the requirements of the Los Angeles County Municipal NPDES permit through the City of Los Angeles's *Development Best Management Practices Handbook, Part B Planning Activities*, 5th Edition, which the City of Los Angeles Department of Public Works adopted in May 2016. 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. 183833.

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 consistency with the City's General Plans, zoning ordinances, and compliance with other applicable local ordinances and codes, including stormwater requirements. Plans and specifications are reviewed to ensure that the appropriate BMPs are incorporated to address stormwater 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:[11]

- Peak Stormwater Runoff Discharge Rate: Post-development peak stormwater runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak stormwater 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;

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11 City of Los Angeles Stormwater Program website, http://www.lastormwater.org/green-la/standard-urban-stormwater-mitigation-plan/; accessed September 6, 2019.

- 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) stormwater 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.

Standard Urban Stormwater Mitigation Plan (SUSMP)

Under the Los Angeles County Municipal NPDES Permit, permittees are required to implement a development planning program to address stormwater pollution. These programs require project applicants for certain types of projects to implement Standard Urban Stormwater Mitigation Plans (SUSMP) throughout the operational life of their projects. The purpose of SUSMP is to reduce the discharge of pollutants in stormwater by outlining BMPs which must be incorporated into the design plans of new development and redevelopment. A project is subject to SUSMP if it falls under one of the categories listed below:

1. Single-family hillside homes
2. Ten or more unit homes (including single family homes, multifamily homes, condominiums, and apartments).
3. Automotive service facilities
4. Restaurants
5. 100,000 or more square-feet of impervious surface in industrial/commercial development.
6. Retail gasoline outlet
7. Parking lots with 5,000 square feet or more of surface area or with 25 or more parking spaces
8. Redevelopment projects in subject categories that meet redevelopment thresholds
9. Location within or directly adjacent to or discharging directly to an environmentally sensitive area if the discharge is likely to impact a sensitive biological species or habitat and the development creates 2,500 square feet or more of impervious surface.

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. [12]

[12] City of Los Angeles. "Development Best Management Practices Handbook." June, 2011

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. GROUNDWATER

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 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 antidegradation 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 Water 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 provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The California Water 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 California Water 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. ENVIRONMENTAL SETTING

3.1. SURFACE WATER HYDROLOGY

3.1.1. REGIONAL

The Project Site is located within the Los Angeles River Watershed in the Los Angeles Basin. The 55-mile long Los Angeles River Watershed encompasses an area of 834 square miles and is bounded, at its headwaters, by the Santa Monica, Santa Susana, and San Gabriel mountains to the north and west. The southern portion of the Watershed captures runoff from urbanized areas surrounding downtown Los Angeles. Jurisdictions in the watershed include the City of Los Angeles (33%), 42 other cities (29%), and eight agencies (37%).

Much of the watershed is highly developed, with residential (36%), open space and agricultural (44%), and commercial/industrial/transportation (20%) being the predominant land uses. Overall, the watershed is approximately one-third pervious.[13]

Specifically, the Project lies within the Los Angeles River Reach 4 Subwatershed of the Upper Los Angeles River Watershed. See Figure 9 for the Los Angeles River Watershed Map. [14]

The Project discharges to City of Los Angeles storm drain infrastructure which connects directly to Los Angeles County storm drain infrastructure and ultimately to the Los Angeles River. Other tributaries include Compton Creek, Rio Hondo and Arroyo Seco. They are fed by a complex underground network of storm drains and a surface network of tributaries.

3.1.2. Local

The Project Site is divided into five drainage areas, which are described further below. The Project Site connects at four points to local storm drainage facilities.

Stormwater flow from Drainage Area A is directed southeasterly, continuing east along South Chandler Boulevard into a Los Angeles County catch basin at the intersection of Vineland Avenue.

Stormwater flow from Drainage Areas B, D and E is ultimately conveyed via sheet flow onto Lankershim Boulevard where it continues in the southerly direction to a City of Los Angeles connector catch basin that connects to a Los Angeles County storm drain at the intersection of Camarillo Street.

Stormwater flow from Drainage Area C connects to underground 10’ x 8’ box culvert owned and maintained by the County of Los Angeles in Tujunga Avenue.

The areas for off-site Metro replacement parking will be analyzed separately. Stormwater flow from the East Lot will be conveyed to the Los Angeles County catch basin at the intersection of Vineland Avenue and South Chandler Boulevard, similarly to Drainage

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13 City of Los Angeles Sanitation website, https://www.lacitysan.org/san/faces/wcnav_externalId/s-lsh-wwd-wp-ewmp-lar; accessed September 6, 2019.

14 County of Los Angeles Public Works website, https://dpw.lacounty.gov/wmd/watershed/LA/docs/lariver_wtrshed.pdf; accessed September 6, 2019.

Area A. Stormwater flow from the West Lot will be conveyed to the Los Angeles County catch basin at the intersection of North Chandler Boulevard and Tujunga Avenue.

Ultimately, the stormwater runoff is transported via a series of underground storm drain pipes and outlet to the Los Angeles River, which is owned and maintained by the County of Los Angeles. This system flows south and east through various cities, ultimately discharging into the Port of Long Beach in the San Pedro Bay.

3.1.3. On Site

As noted above and shown in Figure 1, the Project Site has been divided into five drainage areas.[15] These drainage areas are determined by the drainage patterns and flow paths of stormwater that are tributary to a common point or area. The overall topography slopes southwest and southeast with a change in grade of approximately 9 feet from Cumpston Street to South Chandler Boulevard. The roughly 16-acre existing site consists largely of impervious surfaces such as buildings, asphalt paved parking lots, and other impervious pavements for pedestrian and vehicular circulation. A summary of existing hydrology is provided in Table 1 below. Based on the Los Angeles County Hydrology Manual, the Project Site is underlain by soil type 015 – Tujunga Fine Sandy Loam. As this type of soil has a moderately limited capacity to absorb stormwater during an intense rain event (i.e., a 50-year storm event), existing site soils are anticipated to runoff in a similar manner as runoff from paved surfaces.

As shown in Figure 1, Area A stormwater runoff sheet flows easterly across the site, entering concrete v-gutters which are directed to two sidewalk culverts along Fair Avenue. The sidewalk culverts discharged the stormwater runoff into the street gutter of Fair Avenue. Area B stormwater runoff sheet flows offsite to the northern street gutter of North Chandler Boulevard. Area C stormwater runoff sheets flows into two onsite catch basins, in the east and south, collecting in 18-inch storm drain pipes which converge before traveling offsite. The runoff collected in Area C discharges to an underground box culvert in Tujunga Avenue. Area D stormwater runoff sheets flows into an onsite concrete v-gutter along the southern property line which is conveyed to a sidewalk culvert that discharges to the gutter at South Chandler Boulevard. Area E stormwater runoff sheet flows southeasterly to a concrete v-gutter which is then conveyed through a sidewalk culvert into Weddington Avenue. West Lot stormwater runoff sheet flows north easterly away from the building into the gutter along North Chandler Boulevard which conveys drainage into the catch basin. East Lot stormwater runoff flows southwesterly until it reaches the gutters along South Chandler Boulevard which leads to the catch basin at the corner of Vineland Avenue. As described above, all on-site stormwater is ultimately discharged from the Los Angeles River into the Long Beach Harbor. The runoff flow during a 50-year storm event was determined for each existing drainage area and is shown in Table 1 below.

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[15] The drainage areas tributary to each discharge were determined from a topographical survey.

Table 1- Existing Onsite Drainage Stormwater Runoff Calculations			
Drainage Area	Area (Acres)	Percent Imperviousness (%)	Q50 (cfs) (volumetric flow rate measured in cubic feet per second)
A	10.67	99	35.59
B	0.68	99	2.47
C	1.99	95	7.11
D	0.70	90	2.45
E	1.83	99	6.65
Total	**15.87**	**98**	**54.27**
West Lot	1.01	99	3.13
East Lot	1.83	99	4.79
Total (with Offsite Parking)	***18.71***	***98***	***62.19***

3.2. Surface Water Quality

3.2.1. Regional

As described above, the Project Site is located within the Upper Los Angeles River Watershed Management Area of the Los Angeles Basin, which includes several subwatershed areas. The Project Site is specifically located within Los Angeles River Reach 4 Subwatershed. As previously described, the Project Site ultimately drains to the Long Beach Harbor via a network of City and County storm drain pipes and channels within the Los Angeles River Watershed.

3.2.1.1. Beneficial uses of the Los Angeles River Reach 4 Subwatershed

According to the LARWQCB Basin Plan, many beneficial uses defined in the Basin Plan are identified in water bodies within the Los Angeles River Watershed Management Area.[8] Of these, the existing and potential beneficial uses for the waters within the Los Angeles River Reach 4 Subwatershed, where surface water flows from the Project Site ultimately discharge, are shown in Table 2 and are described below.

Table 2
Beneficial Uses of the Waters within the Los Angeles River Reach 4 Subwatershed Area

Beneficial Use	Los Angeles River Reach 4 Designation
Municipal and Domestic Supply (MUN)	P*
Industrial (IND)	P
Ground Water Recharge (GWR)	E
Warm Freshwater Habitat (WARM)	E
Wildlife Habitat (WILD)	E
Wetlands (WET)	E
Water Contact Recreation (REC-1)	E
Non-contact Water Recreation (REC-2)	E
High Flow Suspension	Y, av

E: Existing beneficial use

P: Potential beneficial use

Y: Currently dry and no plans for restoration.

*: In adherence with State Board Resolution No. 88-63 and Regional Board Resolution No. 89-03, all inland surface and groundwaters have been designated as MUN – presuming at least a potential suitability for such a designation, though no new effluent limitations wll be placed in Waste Discharge Requirements as a result of these designations until the Regional Board adopts an amendment stating waters excepted from this policy.

m: Access prohibited by Los Angeles County Department of Public Works in the Concrete-channelized areas.

av: The High Flow Suspension only applies to water contact recreational activities associated with the swimmable goal as expressed in the federal Clean Water Act section 101(a)(2) and regulated under the REC-1 use, noncontact water recreation involving incidental water contact regulated under the REC-2 use, and the associated bacteriological objectives set to protect those activities. Water quality objectives set to protect (1) other recreational uses associated with the fishable goal as expressed in the federal Clean Water Act section 101(a)(2) and regulated under the REC-1 use and (2) other REC-2 uses (e.g., uses involving the aesthetic aspects of water) shall remain in effect at all times for waters where the (av) footnote appears.

Source: Los Angeles Regional Water Quality Control Board Basin Plan.

Beneficial uses for waterbodies in the Los Angeles River Reach 4 Subwatershed are primarily identified for inland surface waters that receive discharges from the storm drains.

- Municipal and Domestic Supply (MUN): Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

- Industrial Service Supply (IND): Uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

- Ground Water Recharge (GWR): Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

- Warm Freshwater Habitat (WARM) Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

- Wildlife Habitat (WILD): Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

- Wetland Habitat (WET): Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.

- Water Contact Recreation (REC-1): Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

- Non-contact Water Recreation (REC-2): Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

- High Flow Suspension: A High Flow Suspension shall apply to water contact recreational activities associated with the swimmable goal as expressed in the federal Clean Water Act section 101(a)(2) and regulated under the REC-1 use, non-contact water recreation involving incidental water contact regulated under the REC-2 use, and the associated bacteriological objectives set to protect those activities. Water quality objectives set to protect (1) other recreational uses associated with the fishable goal as expressed in the federal Clean Water Act section 101(a)(2) and regulated under the REC-1 use and (2) other REC-2 uses (e.g., uses involving the aesthetic aspects of water) shall remain in effect at all times for waters where the (av) footnote appears in the beneficial use table. The High Flow Suspension shall apply on days with rainfall greater than or equal to ½ inch and the 24 hours following the end of the ½-inch or greater rain event, as measured at the nearest local rain gauge, using local Doppler radar, or using widely accepted rainfall estimation methods. The High Flow Suspension only applies to engineered channels, defined as inland, flowing surface water bodies with a box, V-shaped or trapezoidal configuration that have been lined on the sides and/or bottom with concrete.

3.2.1.2. Impairments and TMDLs in the Los Angeles River Reach 4 Subwatershed

Pursuant to Section 303(d) of the federal Clean Water Act, the State and RWQCBs identify impaired bodies of water that do not meet water quality standards and prioritizes and schedules them for development of TMDLs. A TMDL specifies the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Those facilities and activities that are discharging into the water body, collectively, must not exceed the TMDL. The USEPA approved the most recent Section 303(d) list in November 2010.[16] TMDLs in effect within the Los Angeles River Reach 4 Subwatershed include Ammonia, Coliform Bacteria, Copper, Leader, Algae, and Trash.

Based on the EPA's 2016 Waterbody Quality Assessment Report, the TMDLs for Los Angeles River Reach 4 Subwatershed include Enterococcus Bacteria, E. Coli, Fecal Coliform, Total Coliform, Trash, Copper, Lead, Zinc, Cadmium, Copper, and Selenium.[17]

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16 State Water Resources Control Board, 2010 Integrated Report, available at: http://www.swrcb.ca.gov/water_issues/programs/tmdl/integrated2010.shtml, accessed September 3, 2019.

17 USEPA. 2016 Waterbody Report for Los Angeles River Reach 4 (Sepulveda Dr. to Sepulveda Dam), available at: https://iaspub.epa.gov/waters10/attains_waterbody.control?p_au_id=CAR4052100019990202091417, accessed September 3, 2019.

3.2.2. Local

In general, urban stormwater runoff occurs during and shortly following precipitation events. The volume of water ultimately directed into the drainage system depends on such things as the intensity and duration of the rainstorm and soil moisture. In addition to sediment, contaminants that may be found in stormwater from developed areas include trash, bacteria, metals, nutrients, and potentially, organics and pesticides. The source of contaminants is diffuse and includes all areas where precipitation falls, as well as the air it falls through. Therefore, contaminants on roads, maintenance areas, parking lots, and building tops, which are not usually contained in dry weather discharges, may be carried with rainfall drainage into the drainage system. The City has installed catch basins to capture debris before entering the storm drain system. In addition, the City conducts routine street cleaning operations as well as periodic cleaning and maintenance of catch basins to reduce stormwater pollution within the City.

3.2.3. On Site

While the Project Site currently does not have structural BMPs for the treatment of stormwater runoff from existing impervious surfaces such as building roof areas and pavements, there are a range of non-structural BMPs and environmental water quality measures that are currently utilized at the Project Site to minimize the impact of pollutant sources. These include general housekeeping practices such as regular trash collection, spill prevention and response activities where applicable; proper storage of hazardous materials and wastes; and substituting environmentally friendly products for environmentally hazardous products, such as soaps, solvents, and pesticides. In addition, stormwater runoff from the minimal existing pervious surfaces such as the landscaped areas and lawns is naturally treated to some extent by existing vegetation and the absorptive properties of the existing soils. Based on the existing operations within the Project Site, the on-site runoff likely contains the following pollutants of concern: sediment, nutrients, pesticides, metals, pathogens, and oil and grease.

3.3. Groundwater Level

3.3.1. Regional

Groundwater use for domestic water supply is a major beneficial use of groundwater basins in Los Angeles County. The City of Los Angeles overlies the San Fernando Valley Groundwater Basin. Groundwater flows generally from the edges of the basin toward the middle of the basin, then beneath the Los Angeles River Narrows into the Central Subbasin of the Coastal Plain of Los Angeles Basin. In the northeastern part of the basin, groundwater moves from the La Crescenta area southward beneath the surface of Verdugo Canyon toward the Los Angeles River near Glendale, whereas the groundwater in the Tujunga area flows west following the Tujunga Wash around the Verdugo Mountains to join groundwater flowing from the west following the course of the Los Angeles River near Glendale.[18] Recharge of the basin is from a variety of sources. Spreading of imported water and runoff occurs in the Pacoima, Tujunga, and Hansen Spreading Grounds (ULARAW 1999). Runoff contains natural streamflow from the surrounding mountains, precipitation falling on impervious areas, reclaimed wastewater, and industrial discharges (ULARAW 1999). Water flowing in surface washes infiltrates, particularly in the eastern portion of the basin.[18]

3.3.2. Local

The Project Site specifically overlies the San Fernando Valley Basin, and is located in the southeastern part of the Basin. The basin is bounded on the north and northwest by the Santa Susana Mountains; on the north and northeast by the San Gabriel Mountains, on the east by the San Rafael Hills; on the south by the Santa Monica Mountains and Chalk Hills; and on the west by the Simi Hills. The San Fernando Valley Groundwater Basin is a natural groundwater basin that encompasses a surface area of approximately 266 square miles and is estimated to have a total storage capacity of approximately 3.67 million acre-feet.

Recharge and general flow direction are discussed above. The water-bearing sediments consist of the lower Pleistocene Saugus Formation, Pleistocene and Holocene age alluvium (CSWRB 1962). The groundwater in this basin is mainly unconfined with some confinement within the Saugus Formation in the western part of the basin and in the Sylmar and Eagle Rock areas (CSWRB 1962). The average specific yield for deposits within the basin varies from about 14 to 22 percent (DPW 1934). Well yield averages about 1,220 gpm with a maximum of about 3,240 gpm.[18]

Though the San Fernando Valley Groundwater Basin is managed by adjudication by the Upper Los Angeles River Area Watermaster (ULARA), not enough data exist to compile a complete groundwater budget. A total of about 108,500 acre-feet of groundwater was extracted from the San Fernando Valley Groundwater Basin during the 1997-1998 water year (ULARAW 1999). In addition, subsurface outflow of about 300 acre-feet to the Raymond Groundwater Basin and 404 acre-feet to the Central Subbasin of the Los Angeles Coastal Plain Groundwater Basin is estimated (ULARAW 1999). To balance the extraction, a total of 61,119 sf of native runoff water was diverted to spreading grounds for infiltration (ULARAW 1999).[18]

Los Angeles, under its Pueblo Water Right, has an exclusive right to extract and utilize the entire native safe yield of the San Fernando Basin (SFB) of 43,660 acre-feet per year (AF/Y). Los Angeles, Burbank, and Glendale each have a right to extract the following amounts of groundwater from the SFB:

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18 California Department of Water Resources, *California's Groundwater Bulletin 118*, "San Fernando Valley Groundwater Basin", http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/4-12.pdf, accessed September 3, 2019.

- Los Angeles: 20.8 percent of all delivered water, including recycled water, to valley fill lands of the SFB.

- Burbank: 20.0 percent of all delivered water, including recycled water, to the SFB and its tributary hill and mountain areas.

- Glendale: 20.0 percent of all delivered water, including recycled water, to the SFB and its tributary hill and mountain areas.

Los Angeles, Burbank, and Glendale each have a right to store groundwater in SFB by artificial spreading or by in-lieu activities, and to extract equivalent amounts.

Groundwater levels in the SFB have undergone a general decline during recent years. Probable causes of this decline include increased urbanization and runoff leaving the basin, reduced artificial recharge, and continued groundwater extractions by the three major pumping parties in the SFB - the cities of Los Angeles, Burbank, and Glendale. The Watermaster continues to monitor this situation, and efforts to reverse this trend are underway. The long-term solution will require the close cooperation of the three major pumping parties.[19]

In recent years, unprecedented drought conditions have resulted in reduced allocation of State Water Project (SWP) supplies by the California Department of Water Resources. To address this situation, water agencies within the Metropolitan Water District of Southern California's SWP service territory have been encouraged to reduce their reliance on imported water supplies from the SWP. In response, LADWP has significantly reduced its deliveries from the SWP by adjusting its groundwater pumping forecast to increase the use of local groundwater from the San Fernando Basin. Additionally, construction of replacement supply wells in the Sylmar Basin has been accelerated to further increase the supply of local groundwater. LADWP recognizes that levels of pumping will likely be constrained due to increasing concentrations of contaminants at each operating wellhead. Water quality conditions will be closely monitored and pumping will be curtailed as necessary to ensure that all regulatory standards continue to be met.[20]

3.3.3. On Site

As previously discussed, the Project Site is located within the San Fernando Valley Groundwater Basin. Each block within the Project Site slopes generally to the southeast at

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19 Upper Los Angeles River Area Watermaster.San Fernando Basin, available at: http://ularawatermaster.com/index.html?page_id=914, accessed September 3, 2019.

20 Water Rights & Groundwater Management Group Water Resources Division LADWP, *City of Los Angeles Groundwater Pumping and Spreading Plan in the Upper Los Angeles River Area for Water Years 2015-16 through 2019-20*, December 2016, http://ularawatermaster.com/public_resources/WY2015-20-ULARA-Pump&Spread-12-2016.pdf, accessed September 3, 2019.

varying gradients with an elevation of approximately 636 feet above mean sea level on the northwestern boundary of Parcel 1 to approximately 627 feet above mean sea level on the southeastern boundary, adjacent to Fair Avenue. Geotechnical field explorations for the Project Site consisting of Blocks 0 – 8 were conducted and outlined in the Geotechnical Evaluation Report for CEQA by GPI Geotechnical Professionals, Inc.

Preliminary field investigation disclosed a subsurface profile consisting of shallow undocumented fill soils overlying natural soils. The subsurface profile consisted of less than 1 foot of undocumented fills, primarily consisting of the surface pavement and subsurface aggregate base layers. Natural soils encountered in the field explorations consisted of medium dense to dense, fine to coarse grained, sands and silty sands with trace amounts of gravel up to depths of approximately 38 to 45 feet below the existing grade. Layers of very stiff sandy silts, clayey silts and medium dense to dense silty sands, approximately 2 to 10 feet in thickness, were encountered at depths of approximately 27 to 33 feet below grade. The sand and silty sand layers below the silt layers transitioned from dense to very dense with depth. Very dense, fine to coarse grained sands with varying amounts of gravel and occasional cobbles were encountered at depths of approximately 38 to 45 feet to the maximum depth explored. It's possible that a few random boulders (particles greater than 12 inches in size) could exist in the deeper native soils.[21] Based on geologic information, it is anticipated that the subsurface conditions at the East and West Lots are similar to those encountered in the explorations at Blocks 0-8.

Historical high groundwater is reported to be on the order of 10 feet below ground surface. However, current groundwater levels are expected to be deeper than 62 feet below ground surface. As presented in the Geotechnical Evaluation Report for CEQA for the development, since 1957, the shallowest recorded groundwater level in wells within 1.4 miles of the site is 62 feet below the ground surface. GPI drilled four borings at the Project Site ranging from 81.5 feet to 121 feet and while the borings caved at a depth of 42 to 60 feet, it is not clear if was caused by the presence of groundwater, as groundwater was not encountered in the borings. Due to this large discrepancy between reported high groundwater level and geotechnical evaluation, supplemental groundwater reports were provided by Earth Resources Inc.

Earth Resources' report sought to provide a detailed explanation of the conditions that resulted in such high groundwater conditions in the San Fernando basin in the early 1940's and the reason for its decline since then by analyzing groundwater records, aquifer characteristics, groundwater withdrawal and development history. Earth Resources was able to conclude that, since the 1940's, there has been a spike in development in the North Hollywood area with the installation of flood control networks as well as significant pumping of groundwater to supply this housing boom that were significant contributing

[21] Geotechnical Evaluation Report for CEQA District NoHo Mixed-use Development, dated January 30, 2020 by Geotechnical Professionals, Inc.

factors to the declined levels of groundwater. In the extremely rare case that groundwater was able to recover, it would not likely rise above 65 feet below ground surface.[22]

For the purposes of analyzing potential for liquefaction, the City of Los Angeles Grading Division requires that the historic high groundwater elevation be used. Under this condition, preliminary analyses indicate there is a potential (2 to 3 inches) for liquefaction induced settlement under historical high groundwater conditions. Liquefaction induced settlement is expected to occur between depths of 10 to 45 feet below grade. Mitigation, if needed, would likely include ground modification and/or design of the building foundations to resist the effects of the liquefaction and seismic induced settlements.

Walls below grade should be designed to resist lateral earth pressures and seismic lateral pressures, plus surcharges from adjacent loads. Subterranean walls should be designed to resist hydrostatic pressures in addition to design lateral earth pressures or be provided with a positive domestic drainage system behind the walls.

Where subterranean levels extend below the design groundwater elevation (10'), the subterranean levels of structures will need to be waterproofed and design to resist the hydrostatic pressures imposed on the floor slabs and walls or have wall drainage and a subdrain system installed below the floor slab to collect groundwater and permanently dewater the building location. For hydrostatic design of the subterranean portions of the buildings, consideration will be given to both current and forecasted groundwater levels and historic high groundwater levels would not likely need to be used in design to resist hydrostatic pressure. The City will likely require a standard wall backdrain and subdrain system below the lowest floor to accommodate nuisance and locally perched groundwater. A permanent groundwater dewatering system will not be required based on historic high groundwater levels. If the actual groundwater level is deeper than 62 feet below grade, wall drain and subdrain systems may not need to pump significant volumes of collected groundwater since the system may be above the actual groundwater elevation for their design life. Furthermore, there are no groundwater production wells, public water supply wells, or spreading grounds within one mile of the Project Site.[23] Thus, local groundwater production is not expected to significantly impact groundwater level at the Project Site. Conversely, less than significant impacts to the groundwater level at the Project Site are not expected to affect groundwater level at local groundwater wells or spreading grounds.

3.4. GROUNDWATER QUALITY

3.4.1. REGIONAL

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[22] Geological Review of Historical Groundwater Elevations Proposed "District NoHo" Development Project Vicinity of Lankershim and Chandler Blvd dated June 12, 2019 by Earth Resources, Inc.

[23] State Water Resources Control Board GAMA GeoTracker, available at http://geotracker.waterboards.ca.gov/gama/gamamap/public/default.asp?CMD=runreport&myaddress=5399+lankershim+boulevard; accessed September 6, 2019.

As stated above, the City of Los Angeles overlies the San Fernando Valley Groundwater Basin which is under the jurisdiction of the LARWQCB. According to LARWQCB's Basin Plan, water quality objectives applying to all ground waters of the Region include bacteria, chemical constituents and radioactivity, mineral quality, nitrogen (nitrate, nitrite), and taste and odor.[24]

3.4.2. Local

As stated above, the Project Site specifically overlies the San Fernando Valley Groundwater Basin. Based upon LARWQCB's Basin Plan, constituents of concern listed for the San Fernando Valley Groundwater Basin local to the Project include boron, chloride, sulfate, TDS, and nitrate.[24]

3.4.3. On-Site

Though it is possible for surface water borne contaminants to percolate into groundwater and affect groundwater quality, as the Project Site is 98% impervious in the existing condition, no appreciable infiltration of potential contaminants described above is expected to occur. Additionally, the good housekeeping practices described above and compliance with all existing hazardous waste regulations further reduce this potential. Therefore, groundwater quality is not expected to be impacted by existing activities at the Project Site.

Although the Project Site has had several historic gasoline and/or service stations, there is no indication that there is any residual above- or underground storage tanks nor is there any evidence that indicates any industrial wastewater discharges present on the site.

Field exploration and percolation test was performed by GPI Geotechnical Professionals, Inc. as part of the preliminary analysis of the environmental setting of the Project Site. The measured test results indicated a variance in infiltration rates across the Project Site at the tested locations and depths. Based on the current subsurface exploration, the site is underlain by layers of very stiff sandy silts, clayey silts and medium design to dense silty sands. Very dense and fine to coarse grained sands with gravel and cobbles were discovered at greater depths. The Geotechnical Engineer has determined infiltration of stormwater will be a challenge at the Project Site. Because the upper 45 feet of soils are considered to be liquefiable, infiltration of stormwater that may saturate these soils is not allowed per City of Los Angeles guidelines, therefore warranting a design that capitalizes on deep infiltration. Based on explorations and review of well data, current groundwater levels are deeper than 62 feet below grade. The Geotechnical Engineer has provided design infiltration rates for the three boring locations with applicable reduction factors. Well P-1

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[24] Los Angeles Regional Water Quality State Water Resources Control Board, *Basin Plan*, Water Quality Objectives, May 2013, http://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/electronics_documents/Final%20Chapter%203%20Text.pdf; accessed September 6, 2019.

with a depth of 60 feet was noted to have a design infiltration rate range of 1.7 to 5.0 inches per hours. Well P-2 with a depth of 10 feet was noted to have a design infiltration rate range of 10.9 to 32.8 inches per hour. Lastly, Well P-3 with a depth of 10 feet was noted to have a design infiltration rate range of 0.2 to 0.5 inches per hour. Structural BMPs within the vicinity of the boring location will utilize the design infiltration rate for the purpose of sizing the infiltration system.

4. SIGNIFICANCE THRESHOLDS

4.1. Surface Water Hydrology

The City of Los Angeles 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

The City of Los Angeles *CEQA Thresholds Guide* states that a project would normally have a significant impact on surface water quality if discharges associated with the project 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 CEQA Thresholds Guide and CWC include 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.[25]

4.3. Groundwater

According to the City of Los Angeles CEQA Thresholds Guide a project would normally have a significant impact on groundwater quality and groundwater level 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 CCR, Title 22, Division 4, and Chapter 15 and in the Safe Drinking Water Act.
- 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.

5. METHODOLOGY

5.1. Surface Water Hydrology

The Project Site is located within the City of Los Angeles; 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 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

25 City of Los Angles.LA. CEQA Thresholds Guides.2006

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 City's CEQA Threshold 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 analyzed the larger storm event threshold, the 50-year frequency design storm event.

The analysis of the Project includes the 50-year storm event. The Modified Rational Method was used to calculate stormwater 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 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. Hydrocalc was used to calculate the stormwater peak runoff flow rate for the Project conditions by evaluating an individual sub-area independent of all adjacent subareas. See Figure 3 and Figure 4 for the Hydrocalc results and Figure 5 for Isohyet Map.

5.2. Surface Water Quality

5.2.1. Construction

Construction BMPs will be designed and maintained as part of the implementation of the SWPPP in compliance with the Construction 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 Stormwater Multiple Application and Report Tracking System SMARTS website in compliance with the requirements of the Construction General Permit.

5.2.2. OPERATION

The Project will meet the requirements of the LID Manual[26]. Under section 3.1.3 of the LID Manual, post-construction stormwater runoff from a new development will 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 and the 0.75 inch storm event. The LID Manual prioritizes the selection of BMPs used to comply with storm water mitigation requirements. The order of priority is:

1. Infiltration Systems
2. Stormwater Capture and Use
3. High Efficiency 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. Based on the screening criteria, as described above, infiltration was proven to be feasible due to favorable infiltration rates as determined by the Geotechnical Engineer.

The Project Site in the existing condition is 15.87 acres and is expected to be 16.07 acres in the proposed condition, due to required dedications along adjacent streets to meet City of Los Angeles Mobility Plan standards for public street and sidewalk width as well as proposed street vacations. As stated in the LID Manual, sites with greater than 50% site disturbing activities must treat the entire site. The site disturbing activities of the Project is equivalent to 100% of the total site area and therefore structural BMPs in the proposed condition must treat the entire site area.

5.3. GROUNDWATER

This report discusses the impact of the Project as it relates to the underlying groundwater level of the San Fernando Valley Groundwater Basin. The significance of this Project as it

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[26] Referred to in this report as the "LID Manual" refers to the *Development Best Management Practices Handbook, Part B Planning Activities, 5th Edition*, which was adopted by the City of Los Angeles, Board of Public Works on May 9, 2016, as authorized by Section 64.72 of the Los Angeles Municipal Code approved by Ordinance No. 183833.

relates to the level of the underlying groundwater table included a review of the following considerations:

Analysis and Description of the Project's Existing Condition

- Identification of the San Fernando Valley 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 San Fernando Valley 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. PROJECT IMPACTS

6.1. CONSTRUCTION

6.1.1. SURFACE WATER HYDROLOGY

Construction activities for the Project would include excavating down a maximum of 60 feet for basement levels, building structures, foundations and hardscape and landscape around the structures. It is anticipated that grading activities of approximately 672,300 net cubic yards of soil would be involved in construction of the Project. This includes 587,300 cubic yards of export. These activities have potential to temporarily alter existing drainage patterns and flows on the Project Site by exposing the underlying soils, modifying flow direction, and making the Project Site temporarily more permeable. Also, exposed and stockpiled soils could be subject to erosion 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 would be required to comply with all applicable City grading permit regulations that require necessary measures, plans, and inspections to reduce sedimentation and erosion. Thus, through compliance with all NPDES General Construction Permit requirements, including preparation of a SWPPP, 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, siltation, flooding on- or off-site. Similarly, adherence to standard compliance measurements in construction activities would not cause flooding, substantially increase or decrease the amount of surface water flow from the Project Site into a water body, or result in a permanent, adverse change to the movement of surface water. As such, 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/operation of construction equipment, potential dewatering, and handling/storage/disposal of materials could contribute to pollutant loading in stormwater runoff. However, as previously discussed, construction contractors disturbing greater than on acre of soil would be required to obtain coverage under the NPDES General Construction Permit (order No. 2009-0009-SWQ). 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 10 for typical SWPPP BMPs to be implemented during construction of the Project.

As discussed below, the Project is not expected to require dewatering during construction. Dewatering operations are practices that discharge non-stormwater, such as ground water, that must be removed from a work location to proceed with construction into the drainage system. Discharges from dewatering operations can contain high levels of fine sediments, which if not properly treated, could lead to exceedance of the NPDES requirements. If groundwater is encountered during construction, temporary pumps and filtration would be utilized in compliance with the NPDES permit. These temporary systems would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations.

With the implementation of site-specific BMPs included as part of the SWPPP, the Project would reduce or eliminate the discharge of potential pollutants from the stormwater runoff. In addition, the Project Applicant would be required to comply with City grading permit regulations, which require necessary measures, plans (including a wet weather erosion control plan if construction occurs during the rainy season), and inspection to reduce sedimentation and erosion. Therefore, with compliance with NPDES requirements and City grading regulations, construction of the Project would not result in discharge that would violate any water quality standard or waste discharge requirements, or otherwise substantially degrade water quality. Furthermore, construction of the Project would not result in discharges that would cause regulatory standards to be violated in the Los Angeles River. Therefore, temporary construction-related impacts on surface water quality would be less than significant.

6.1.3. GROUNDWATER HYDROLOGY

As described above, no water supply wells are located at the Project Site or within one mile of the Project Site that could be impacted by construction, nor would the Project include the construction of water supply wells. Development of the Project would include excavations to a maximum depth of approximately 60 feet below ground surface. As described in the Geotechnical Feasibility Report prepared for the Project Site, the historic high groundwater level in the vicinity of the Project Site was on the order of 10 feet below grade. However, as stated in the field exploration analysis, due to a permanent change in the hydrology of the region through urbanization and the lining of rivers and flood channels including the Los Angeles River, it is extremely unlikely that groundwater levels will approach the historic high levels measured prior to the lining of the rivers and creeks. According to data provided in the Geotechnical Conceptual Design Report, groundwater was not encountered in the three borings drilled to a depth of 62 feet. Accordingly, it is not expected that groundwater would be encountered during construction that would require temporary or permanent dewatering operations. Therefore, as the 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

As discussed above, the Project would include excavations to a maximum depth of approximately 60 feet below ground surface. The Project would also result in a net export 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. In addition, as there are no groundwater production wells or public water supply wells on-site or 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

As discussed above, based on the drainage patterns and flow paths of stormwater that are tributary to a common point or area within the Project Site, the Project Site has been divided into nine drainage areas. The boundaries of these nine drainage areas with implementation of the Project are illustrated in Figure 2. As shown in Figure 1 and Figure 2, the boundaries of the drainage areas would change as a result of the proposed condition. Runoff would follow new discharge paths and drain to on-site storm drain infrastructure rather than sheet flowing offsite as seen in the existing condition. In the proposed condition, runoff will drain to on-site catch basins, conveyed via underground storm drain pipes, pretreated, and infiltrated via drywell. Although the Project Site changes the discharge paths seen in the existing condition, the onsite drainage system is significantly improved through the implementation of storm drain infrastructure and structural BMPs.

Table 1, above, summarizes existing onsite percent imperviousness conditions. Existing impervious surfaces include buildings and impervious pavements for pedestrian and vehicular circulation. Existing pervious surfaces include landscaped areas and lawns. Table 3, below, summarizes proposed onsite percent imperviousness conditions. The Project would include development of new buildings, paved areas, lawns and landscaped areas. As shown in Table 3, the Project imperviousness would decrease from 98% to 91% as a result of the development. Under proposed conditions, the Project Site will add pervious area such as landscaping thus reducing the site runoff.

Table 3- Proposed Onsite Drainage Stormwater Runoff Calculations			
Drainage Area	Area (Acres)	Percent Imperviousness (%)	Q50 (cfs) (volumetric flow rate measured in cubic feet per second)
A	1.98	90	6.32
B	1.99	90	5.89
C	1.47	90	5.14
D	1.01	95	3.61
E	1.12	90	3.91
F	3.30	85	10.28
G	0.65	95	2.32
H	2.69	90	8.59
I	1.86	95	6.64
Total	**16.07**	**90**	**52.70**
West Lot	*1.01*	*99*	*3.13*
East Lot	*1.83*	*99*	*4.79*
Total (with Offsite Parking)	***18.91***	***91***	***60.62***

Tables 1 and 3, above, also show the existing 50-year frequency design storm event peak flow rate and proposed 50-year frequency design storm event peak flow rate within the Project Site. A comparison of the pre and post peak flow rates indicates a decrease in stormwater runoff as a result of the increase in pervious area. From pre-development conditions to post-development, stormwater is expected to be reduced by approximately 1.57 cfs, a 3% reduction. While there was a significant decrease in impervious areas for the Project Sites, there was an increase in site area as a result of taking advantage of potential vacations due to oversized streets. Additionally, the offsite parking will not be contributing to the reduction in impervious area as it will replace an existing parking lot with a parking structure, therefore there is not a reduction in stormwater runoff for the offsite parking areas. It is still expected that the Project would not cause flooding during the 50-year developed storm event nor would it substantially increase surface water. As such, operation of the Project would result in a less than significant impact on surface water hydrology.

In addition, as described above, as part of the LID requirements for the Project to manage post-construction stormwater runoff, the Project would include the installation of catch basins, planter drains, building roof drain downspouts, pretreatment systems, and drywells throughout the Project Site to collect roof and site runoff and direct stormwater away from structures through a series of underground storm drain pipes. This on-site stormwater conveyance system would serve to prevent onsite flooding and nuisance water on the Project Site. In addition, with implementation of the proposed LID BMPs described below, the volume of water leaving the Project Site would be further reduced compared to existing conditions.

Earthquake-induced flooding can result from the failure of dams or other water-retaining structures resulting from earthquakes. According to the City of Los Angeles General Plan – Safety Element, the project site is located within a flood impact zone associated with the Encino Reservoir (City of Los Angeles, 1996), as indicated in Figure 6, Dam Inundation Map. Although the site is mapped within an inundation zone for Hansen Dam, catastrophic failure of this dam is expected to be a very unlikely event in that dam safety regulations exist and are enforced by the Division of Safety of Dams (DSOD), Army Corp of Engineers (ACOE) and Department of Water Resources (DWR). Inspectors would require dam owners to perform work, maintenance or implement controls if issues are found with the safety of the dam. The dams are under continuous monitoring for safety against failure. It is our opinion that the potential for seismically-induced flooding to affect the site due to dam failure is low. Therefore, the risk of flooding from inundation by dam failure is considered low and impacts are less than significant.

Additionally, the Project Site is not located within a FEMA or City of Los Angeles designated 100- or 500-year flood plain. See Figure 7 for FEMA Flood Hazard Map.

6.2.2. Surface Water Quality

As previously described, the Project would be required to implement LID requirements throughout the operational life of the Project. As part of these requirements, the Project would prepare a LID Plan which would outline the stormwater treatment measures or post-construction BMPs required to control pollutants of concern. In addition, the Project is required to reduce the quantity and improve the quality of rainfall runoff that leaves the Project Site. The Project Site would include the installation of infiltration systems, as established by the LID Manual.

The LID Manual prioritizes BMPs with infiltration systems as the top tier priority BMP. Feasibility of the proposed infiltration BMP will be determined according to the criteria established in the LID manual, along with coordination with the City. As stated above, the Geotechnical Engineer has performed a site infiltration evaluation and has recommended a range of design infiltration rates for infiltration BMPs. As expected for 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 are sediment, nutrients, pesticides, metals, pathogens, and oil and grease.

The pollutants listed above are expected to, and would in fact, be mitigated through the implementation of approved LID BMPs. In addition, the implementation of the following post-construction BMPs would be included as part of the LID Plan for the Project to manage post-construction stormwater runoff.

- Promote evapotranspiration and infiltration, and the use of native and/or drought tolerant plants;
- Provide storm drain system stenciling and signage to discourage illegal dumping;
- Design material storage areas and loading docks within structures or enclosures to prevent leaks or spills of pollutants from entering the storm drain system;
- Provide evidence of ongoing BMP maintenance as part of a legal agreement with the City of Los Angeles. Recorded covenant and agreements for BMP maintenance are part of standard building permit approval processing; and
- Design post-construction structural or treatment control BMPs to infiltrate stormwater runoff. Stormwater treatment facilities and systems would be designed to meet the requirements of the LID Manual.

As stated in the LID Manual, sites with greater than 50% site disturbing activities must treat the entire site. As set forth in the LID Manual, infiltration facilities shall be sized to capture and infiltrate the design capture volume based on the runoff produced from the greater between the 85th percentile storm event and the 0.75-inch storm event. Based on these requirements, the Project Site will implement pretreatment systems and drywells at each site or drainage area to treat and infiltrate the stormwater runoff. The drywells to be implemented under the proposed conditions are outlined in Table 4 below. In addition, typical infiltration BMPs are provided in Figure 10 and a summary of the calculations consistent with the LID manual are provided in Table 4.

Table 4 – Proposed Onsite Structural BMPs

Proposed Drainage Area	**Proposed Site**	**Proposed Drainage Area**	**Proposed Number of Drywells**
Area A	Block 1	1.98	6
Area B	Block 2	1.98	5
Area C	Block 3	1.47	4
Area D	Block 4	1.01	1

Area E	Block 4	1.12	3
Area F	Block 1 East, 5/6	3.30	5
Area G	Block 7	0.65	2
Area H	Block 0 West	2.69	8
Area I	Block 8	1.86	6
	West Lot	*1.01*	*4*
	East Lot	*1.83*	*6*
Total		**18.91**	**50**

As described above, the Project Site currently does not have structural BMPs for the treatment of stormwater runoff from the existing impervious surfaces. Therefore, implementation of BMP systems proposed as part of the Project would result in a substantial improvement in surface water quality runoff from Blocks 0 - 8. In addition, the implementation of BMPs, which would utilize the natural adsorption and filtration characteristics of vegetated swales and pervious surfaces, would allow for more opportunities to direct stormwater to flow through the planting media where pollutants are filtered, absorbed, and biodegraded by the soil and plants, prior to infiltrating to the ground below. However, due to the limited vegetated area in the proposed condition, these effects are expected to be less significant than the proposed structural BMPs in terms of incremental improvement of existing conditions.

Due to the variation in infiltration rates across the multiple sites that make up the total Project Site, it can be observed in Table 4 that some drainage areas will require a larger number of drywells regardless of acreage. This is due to the soil's variation in ability to allow stormwater to percolate. With additional soil testing, it is likely that the proposed number of drywells can be reduced.[27]

Based on the above, with implementation of BMPs such as those described above, operation of the Project would not result in discharges that would cause: (1) an incremental increase in pollution which would alter the quality of the waters of the State (i.e., LA River) to a degree which unreasonably affects beneficial uses of the waters; (2) an incremental increase of 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) an incremental increase in the nuisance that would be injurious to health;

[27] The sites that have not received infiltration testing yet have been assumed to have a minimum allowable infiltration rate per City of Los Angeles LID Manual of 0.5"/hour. The Blocks that have not received site specific infiltration testing are the offsite parking lots and Block 0 West. Although site-specific testing has not been performed, boring logs indicate soils favorable to infiltration as well as similarities in geologic conditions between the Blocks.

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, operation of the Project would not result in discharges that would cause regulatory standards to be violated in the Los Angeles River nor the Long Beach Harbor. Thus, operational impacts on surface water quality would be less than significant.

6.2.3. GROUNDWATER HYDROLOGY

The percolation of precipitation that falls on pervious surfaces is variable dependent upon the soil type, condition of the soil, vegetative cover, and other factors. The development would include both the addition and removal of impervious surfaces throughout Blocks 0 -8 and the potential offsite parking areas. However, the Project would include the installation of LID BMPs, which would mitigate at minimum the first flush or the equivalent of the greater between the 85th percentile storm and first 0.75-inch of rainfall for any storm event. The installed BMP systems will be designed with an internal bypass or overflow system to prevent upstream flooding due to large storm events. The stormwater 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, which would affect groundwater hydrology, including the direction of groundwater flow.

As discussed above, Project development would require excavations with a maximum depth of approximately 60 feet below grade. As described in the Geotechnical Evaluation prepared for the Project Site, the historic high groundwater level in the vicinity of the Project site is on the order of 10 feet below grade. However, based on boring logs and further geologic investigation, groundwater is not expected to be encountered until further than 62 feet below grade. If subterranean levels extend below the groundwater elevation, the subterranean levels of structures will need to have wall drainage and a subdrain system installed below the floor slab to collect groundwater and permanently dewater the building location. Furthermore, there are no existing wells or spreading grounds within one mile of the Project Site and the Project would not include new injection or supply wells.

Based on the above, operation of the Project would result in a less than significant impact on groundwater hydrology, including groundwater levels.

6.2.4. GROUNDWATER QUALITY

Operational activities which could affect groundwater quality include spills of hazardous materials and leaking underground storage tanks. Surface spills from the handling of hazardous materials most often involve small quantities and are cleaned up in a timely manner, thereby resulting in little threat to groundwater. Other types of risks such as leaking underground storage tanks have a greater potential to affect groundwater. No underground tanks or other potential hazardous structures are proposed as part of the Project. Therefore, the Project Site will result in a less than significant impact on groundwater quality.

In addition, compliance with all applicable existing regulations at the Project Site would prevent the Project from affecting or expanding any potential areas of contamination, increasing the level of contamination, or causing regulatory water quality standards at an existing production well to be violated, as defined in CCR, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. Furthermore, as described above, operation of the Project would not require extraction from the groundwater supply based on the depth of excavation for the proposed uses and the depth of groundwater below the Project Site.

The Project does not include the installation or operation 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. The Project does not include surface or subsurface application or introduction of potential contaminants or waste materials during construction or operation. 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. Additionally, the Project would include the installation of structural BMPs as a means of pretreatment prior to infiltration of the first flush or equivalent of the greater between the 85^{th} percentile storm event and the first 0.75-inch of rainfall for any storm event, which would allow for treatment of the on-site stormwater prior to potential contact with the groundwater below.

Based on the above, operation of the Project would result in a less than significant impact on groundwater quality.

6.3. Cumulative Impacts

6.3.1. Surface Water Hydrology

The geographic context for the cumulative impact analysis on surface water hydrology is the Los Angeles River Watershed. The Project in conjunction with the cumulative growth in the Los Angeles River Watershed (inclusive of the related projects) would cumulatively increase stormwater runoff flows potentially resulting in cumulative impacts to surface water hydrology. However, as described above, in accordance with City requirements, related projects and other future development projects would be required to implement BMPs such that post-development peak stormwater runoff discharge rates would not exceed the estimated pre-development rates. Furthermore, LACDPW would review each future development project on a case-by-case basis to ensure sufficient local and regional drainage capacity is available to accommodate stormwater runoff. Therefore, cumulative impacts on surface water hydrology would be less than significant.

6.3.2. SURFACE WATER QUALITY

The geographic context for the cumulative impact analysis on surface water quality is the Los Angeles River Watershed. As with the Project, cumulative growth in the Los Angeles River Watershed (inclusive of the related projects) would be subject to NPDES requirements regarding water quality for both construction and operation. In addition, it is anticipated that the related project and other future development projects would also be subject to SWPPP and LID requirements and implementation of measures to comply with total maximum daily loads. Furthermore, increases in regional controls associated with other elements of the MS4 Permit would improve regional water quality over time. Additionally, with implementation of the Project, new BMPs for the treatment of stormwater runoff would be installed, thus improving the surface water quality runoff from the campus compared to existing conditions. Therefore, with compliance with all applicable laws, rules and regulations, cumulative impacts to surface water quality would be less than significant.

6.3.3. GROUNDWATER HYDROLOGY

Cumulative groundwater hydrology impacts could result from the overall utilization of groundwater basins located in proximity to the Project Site and the related projects. In addition, interruptions to existing injection or supply wells or designated spreading grounds would have the potential to affect groundwater levels. Any calculation of the extent to which the related projects would extract or otherwise directly utilize groundwater would be speculative. Nonetheless, to the extent existing injection or supply wells or designated spreading grounds are located within or near the related project sites, could adversely affect local and regional groundwater hydrology, including groundwater levels. In addition, the cumulative utilization of groundwater in the region, either as a result of water extraction under the related project sites or extraction from local basins by the local water supply agency to accommodate the related projects could also adversely affect local and regional groundwater hydrology. However, as described above, no water supply wells, spreading grounds, or injection wells are located within a one-mile radius of the Project Site. In addition, Project development would not involve the temporary or permanent extraction of groundwater from the Project Site or otherwise utilize the groundwater.

Furthermore, as infiltration systems are designed to infiltrate only the greater of the 85^{th} percentile storm and or the first 0.75-inch of rainfall for any storm event, the infiltration of stormwater as a means of stormwater treatment and management within the Project Site and related project sites would not result in a cumulative effect to groundwater hydrology.

Based on the above, cumulative impacts to groundwater hydrology would be less than significant.

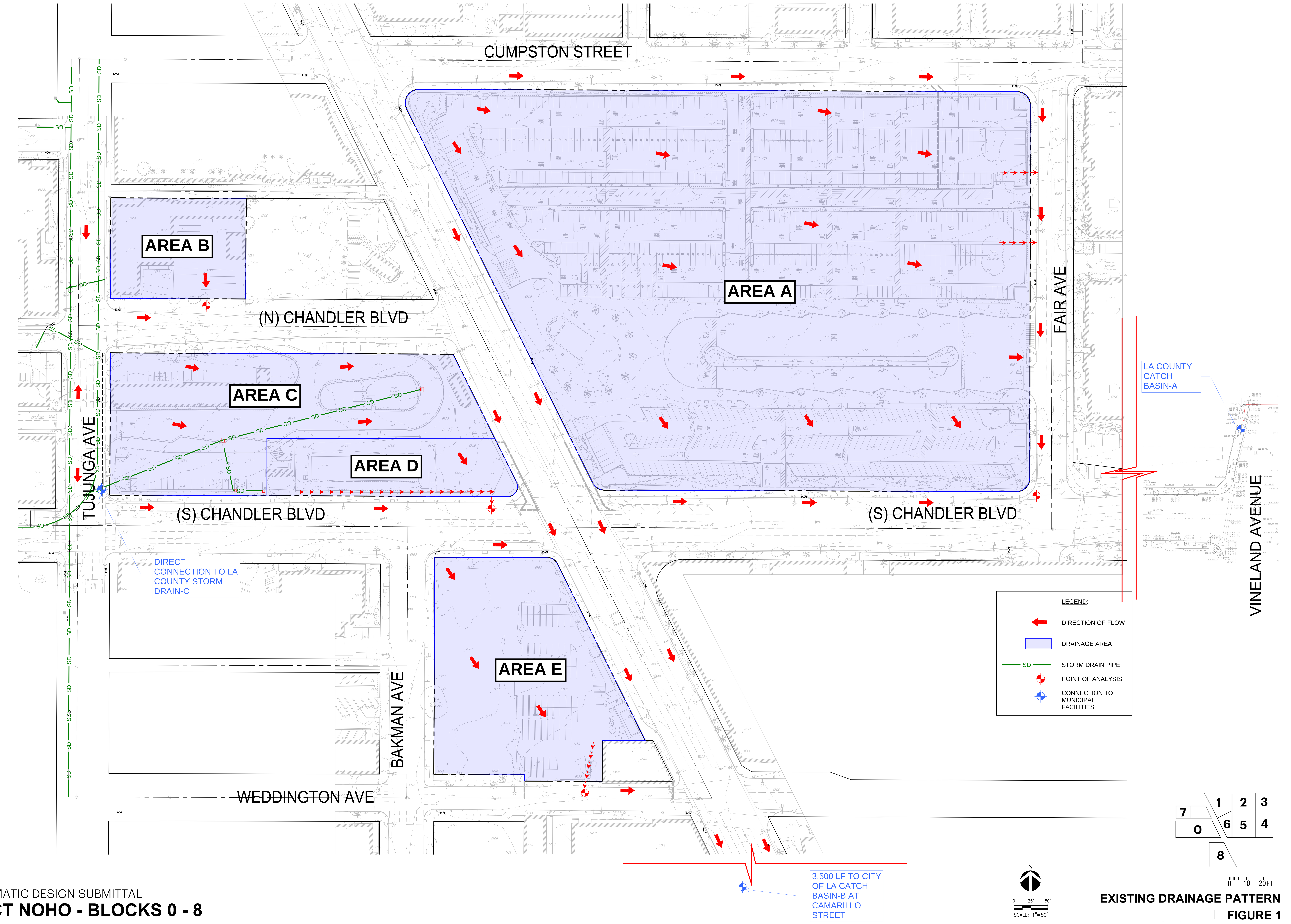
6.3.4. GROUNDWATER QUALITY

As described above, compliance with all applicable existing regulations at the Project Site would prevent the Project from affecting or expanding any potential areas affected by contamination, increasing the level of contamination, or causing regulatory water quality standards at an existing production well to be violated, as defined in CCR, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. As with the Project, other future development projects would be unlikely to cause or increase groundwater contamination because compliance with existing statutes and regulations would similarly prevent the future development projects from affecting or expanding any potential areas affected by contamination, or increasing the level of contamination, or causing regulatory water quality standards at an existing production well to be violated. Therefore, cumulative impacts to groundwater quality would be less than significant.

7. 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.

APPENDIX



50% SCHEMATIC DESIGN SUBMITTAL

DISTRICT NOHO - BLOCKS 0 - 8

9999 LANKERSHIM BLVD. NORTH HOLLYWOOD, CA 91601

EXISTING DRAINAGE PATTERN

FIGURE 1

kpff
700 South Flower Street
Suite 2100
Los Angeles, CA 90017
O: 213.418.0201
F: 213.266.5294
www.kpff.com

Gensler RELM HKS

FIGURE 1B
EXISTING EAST
LOT DRAINAGE

FIGURE 1C
EXISTING WEST
LOT DRAINAGE
North Hollywood
Taekwondo
MKM Cultural
Arts Center
Chandler Blvd
Chandler Blvd
Chandler Blvd
L A Soccer Club
The AArrow
Sign Spinners
Tujunga Ave
Orange Line Busway
Orange Line Busway
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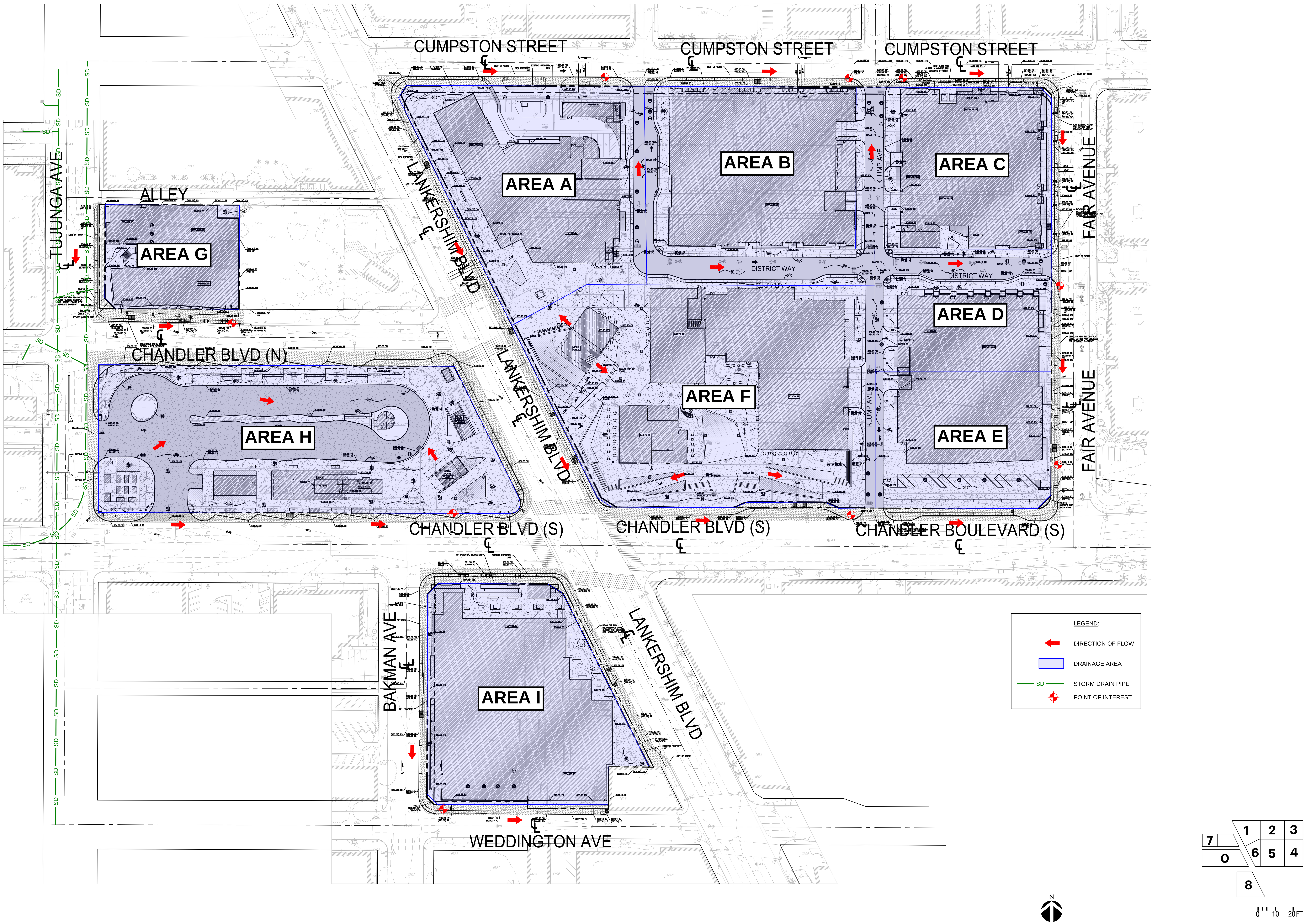


PROPOSED DRAINAGE PATTERN
FIGURE 2

DISTRICT NOHO - BLOCKS 0 - 8

9999 LANKERSHIM BLVD. NORTH HOLLYWOOD, CA 91601

kpff 700 South Flower Street Suite 2100 Los Angeles, CA 90017 O: 213.418.0201 F: 213.266.5294 www.kpff.com

Gensler RELM HKS

Peak Flow Hydrologic Analysis

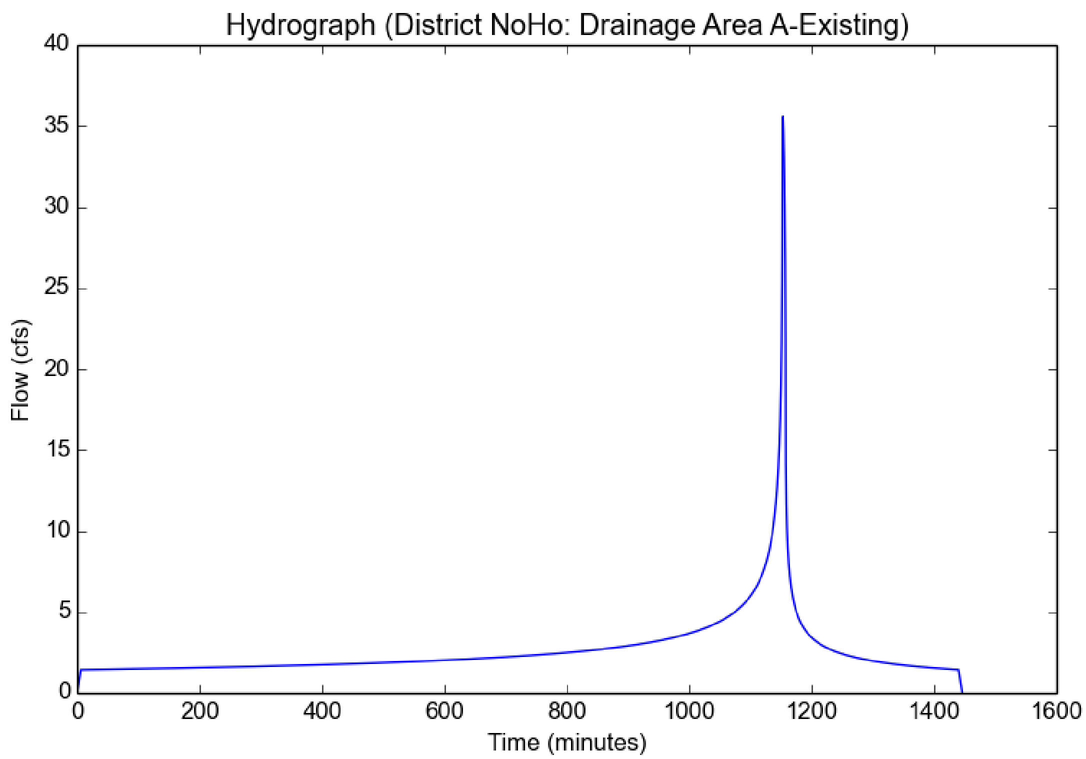
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area A-Existing
Area (ac)	10.67
Flow Path Length (ft)	600.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.7239
Undeveloped Runoff Coefficient (Cu)	0.4799
Developed Runoff Coefficient (Cd)	0.8958
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	35.5936
Burned Peak Flow Rate (cfs)	35.5936
24-Hr Clear Runoff Volume (ac-ft)	5.3502
24-Hr Clear Runoff Volume (cu-ft)	233055.7035



Peak Flow Hydrologic Analysis

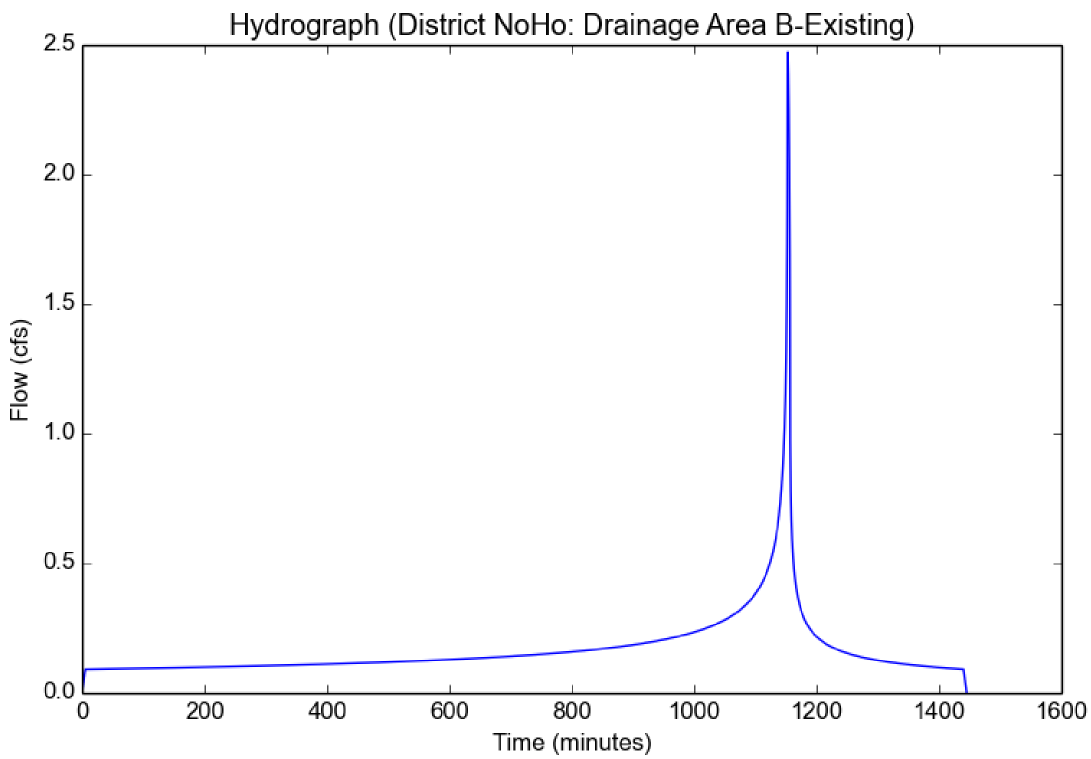
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area B-Existing
Area (ac)	0.68
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8961
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.4722
Burned Peak Flow Rate (cfs)	2.4722
24-Hr Clear Runoff Volume (ac-ft)	0.341
24-Hr Clear Runoff Volume (cu-ft)	14852.773



Peak Flow Hydrologic Analysis

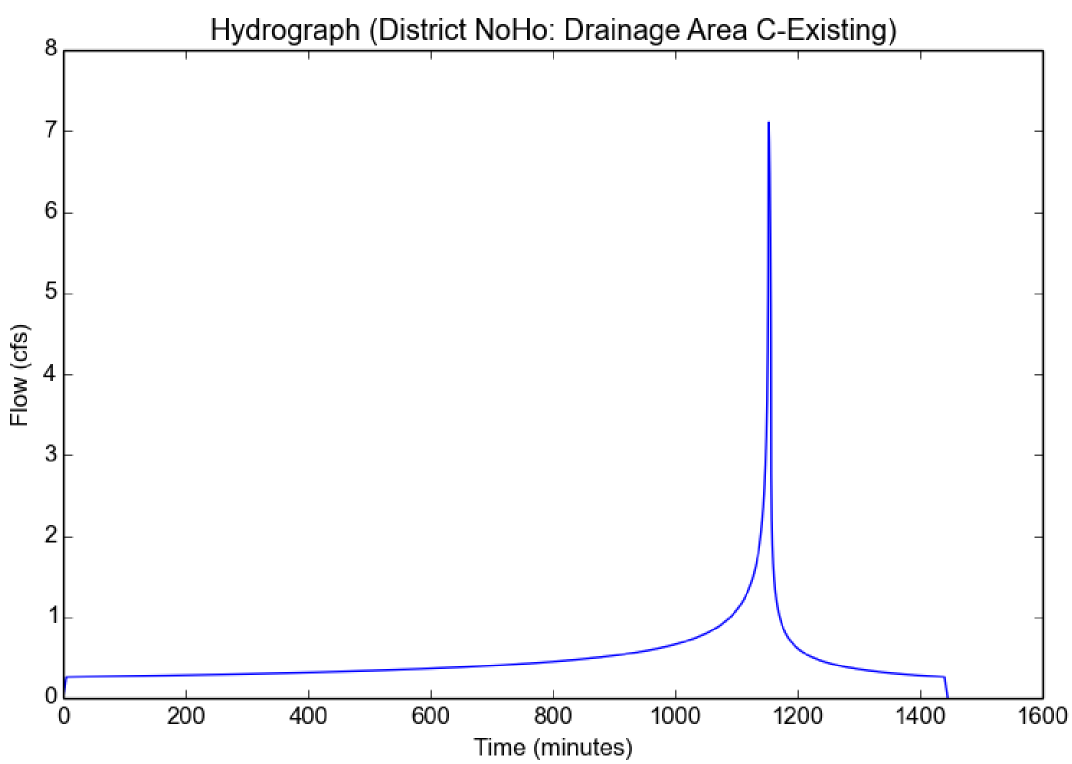
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area C-Existing
Area (ac)	1.99
Flow Path Length (ft)	400.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.95
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8805
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	7.109
Burned Peak Flow Rate (cfs)	7.109
24-Hr Clear Runoff Volume (ac-ft)	0.9632
24-Hr Clear Runoff Volume (cu-ft)	41956.2414



Peak Flow Hydrologic Analysis

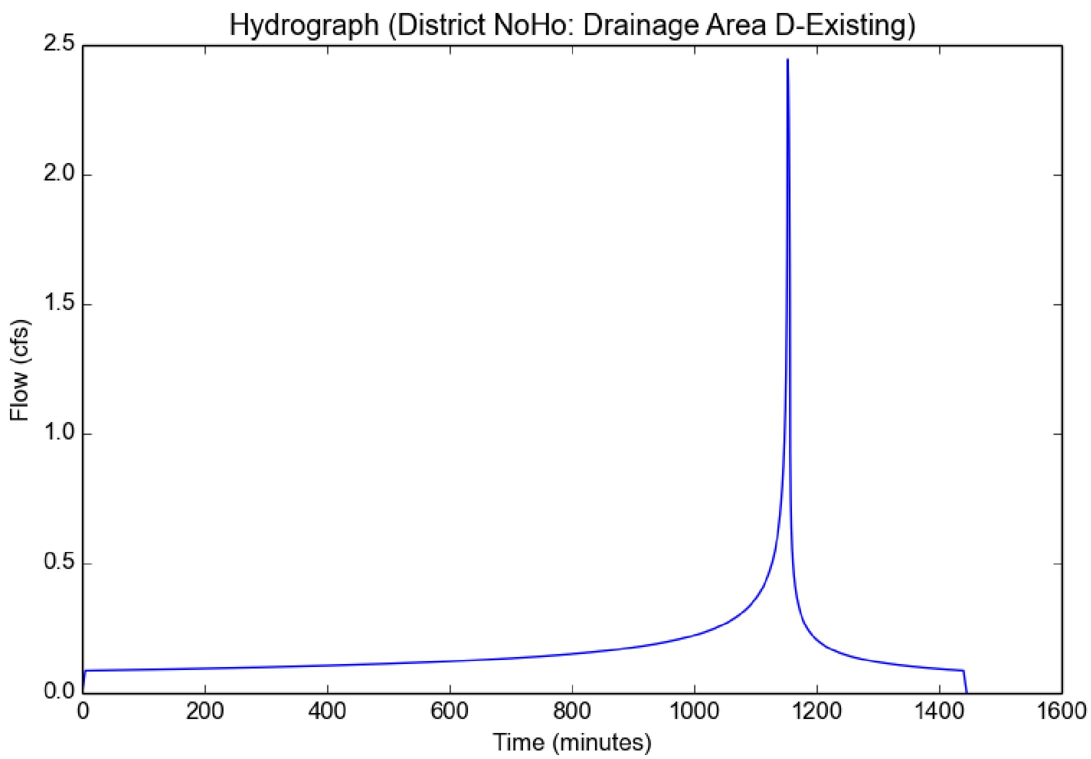
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area D-Existing
Area (ac)	0.7
Flow Path Length (ft)	300.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.9
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8611
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.4454
Burned Peak Flow Rate (cfs)	2.4454
24-Hr Clear Runoff Volume (ac-ft)	0.3236
24-Hr Clear Runoff Volume (cu-ft)	14094.5489



Peak Flow Hydrologic Analysis

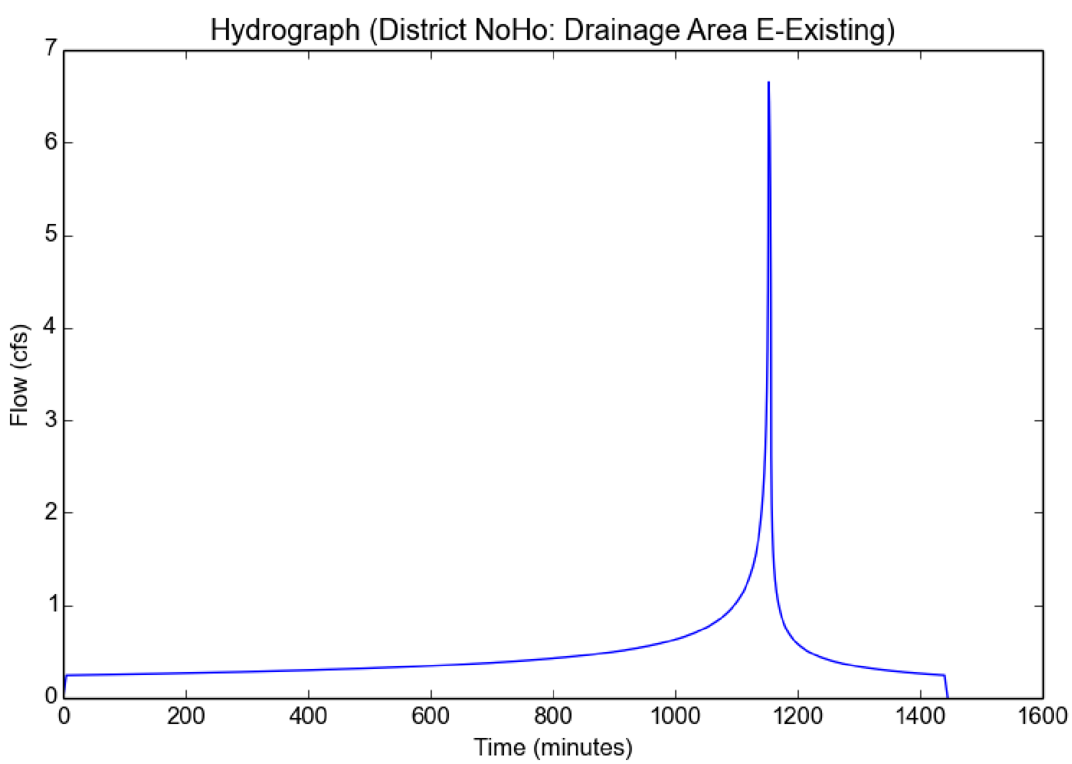
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area E-Existing
Area (ac)	1.83
Flow Path Length (ft)	300.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8961
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.6531
Burned Peak Flow Rate (cfs)	6.6531
24-Hr Clear Runoff Volume (ac-ft)	0.9176
24-Hr Clear Runoff Volume (cu-ft)	39971.4332



Peak Flow Hydrologic Analysis

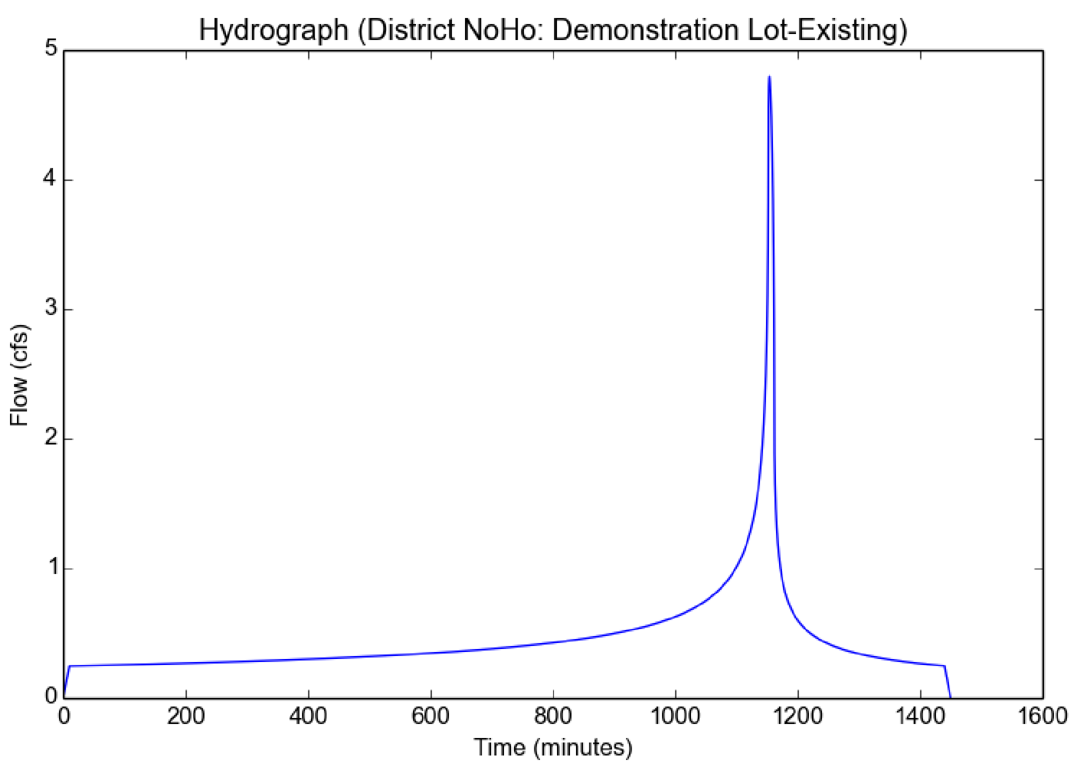
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	East Lot-Existing
Area (ac)	1.83
Flow Path Length (ft)	1000.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	2.9291
Undeveloped Runoff Coefficient (Cu)	0.4021
Developed Runoff Coefficient (Cd)	0.895
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	4.7975
Burned Peak Flow Rate (cfs)	4.7975
24-Hr Clear Runoff Volume (ac-ft)	0.9176
24-Hr Clear Runoff Volume (cu-ft)	39970.2169



Peak Flow Hydrologic Analysis

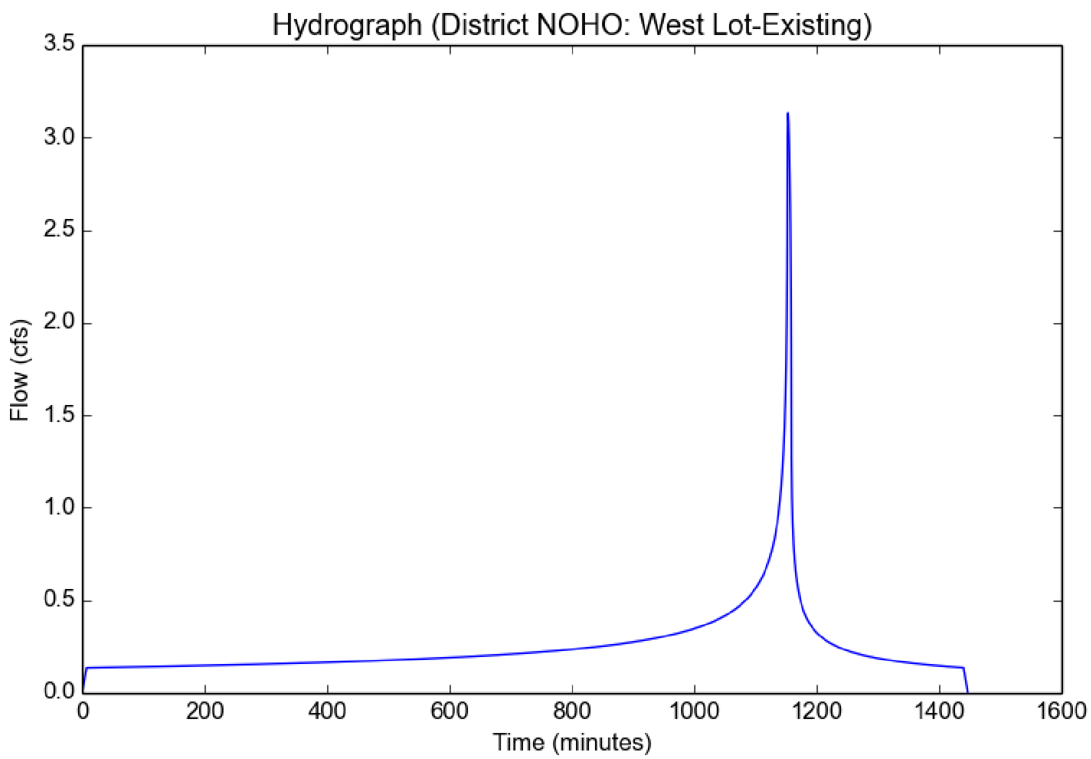
File location: P:/2017/1700732 Metro NoHo/ENGR/EIR SUPPORT/Water Resource Appendix/Figure 3G - Hydro-Calc Hydrology Results for Existing Wes
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NOHO
Subarea ID	West Lot-Existing
Area (ac)	1.01
Flow Path Length (ft)	600.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.4636
Undeveloped Runoff Coefficient (Cu)	0.455
Developed Runoff Coefficient (Cd)	0.8955
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	3.1329
Burned Peak Flow Rate (cfs)	3.1329
24-Hr Clear Runoff Volume (ac-ft)	0.5064
24-Hr Clear Runoff Volume (cu-ft)	22060.4252



Peak Flow Hydrologic Analysis

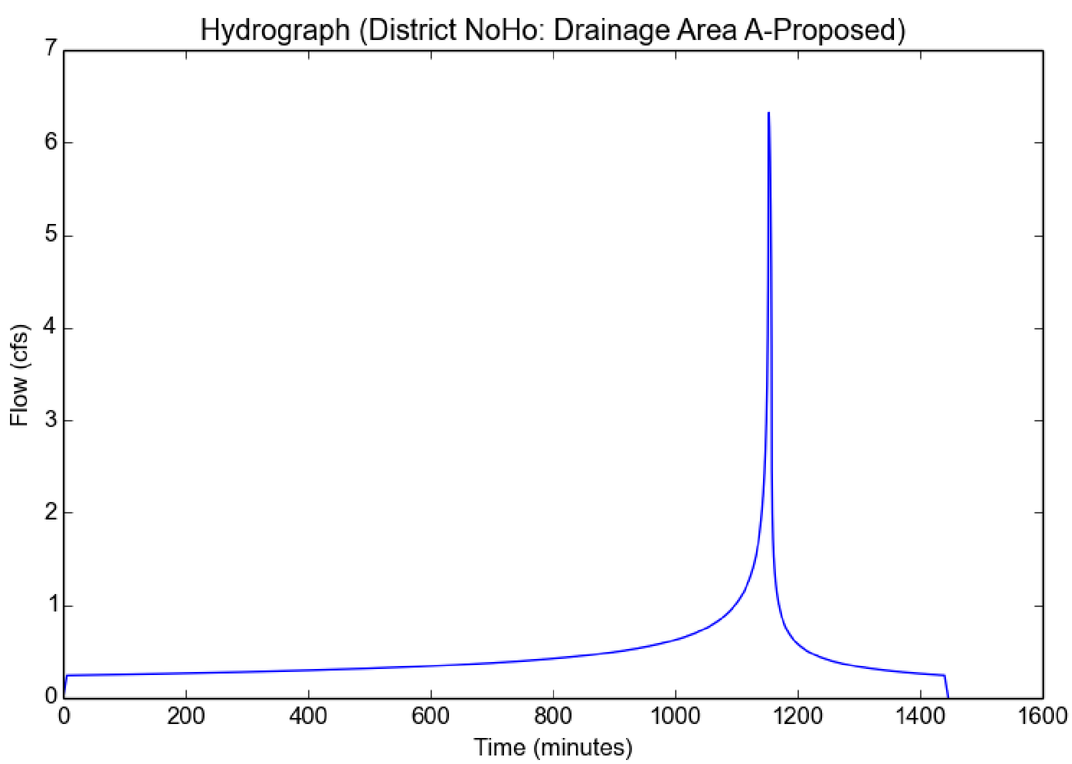
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area A-Proposed
Area (ac)	1.98
Flow Path Length (ft)	380.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.9
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.7239
Undeveloped Runoff Coefficient (Cu)	0.4799
Developed Runoff Coefficient (Cd)	0.858
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	6.3262
Burned Peak Flow Rate (cfs)	6.3262
24-Hr Clear Runoff Volume (ac-ft)	0.9152
24-Hr Clear Runoff Volume (cu-ft)	39864.0839



Peak Flow Hydrologic Analysis

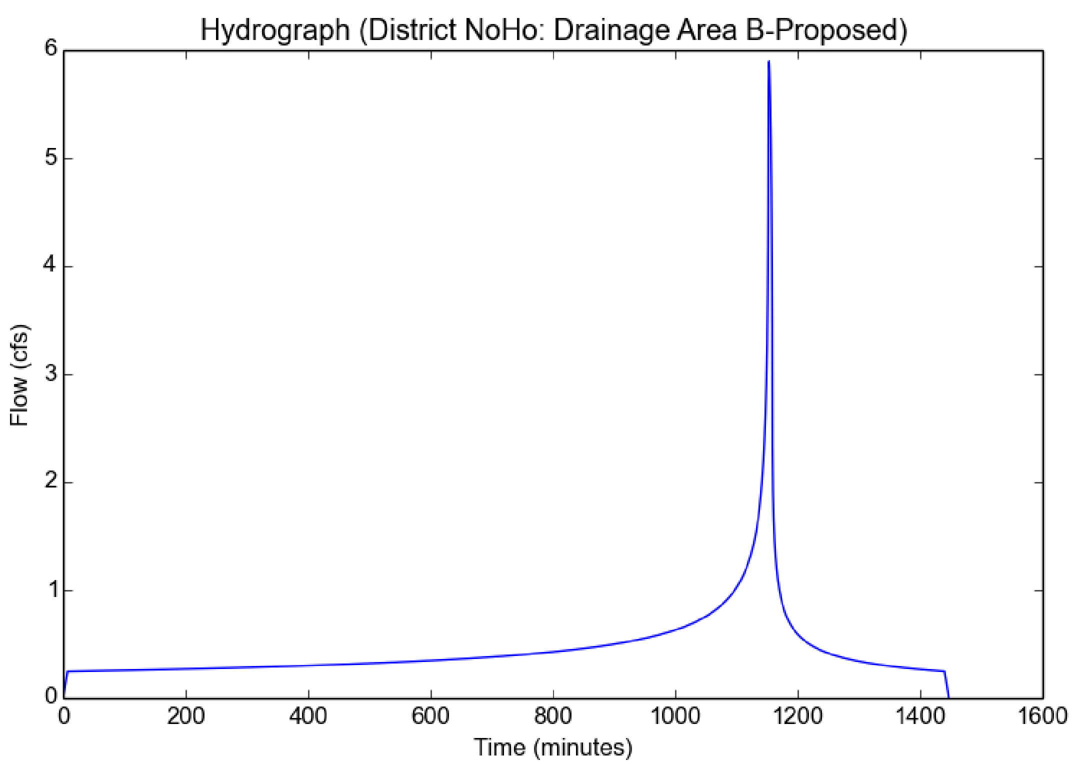
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area B-Proposed
Area (ac)	1.99
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.9
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.4636
Undeveloped Runoff Coefficient (Cu)	0.455
Developed Runoff Coefficient (Cd)	0.8555
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	5.8966
Burned Peak Flow Rate (cfs)	5.8966
24-Hr Clear Runoff Volume (ac-ft)	0.9197
24-Hr Clear Runoff Volume (cu-ft)	40062.5398



Peak Flow Hydrologic Analysis

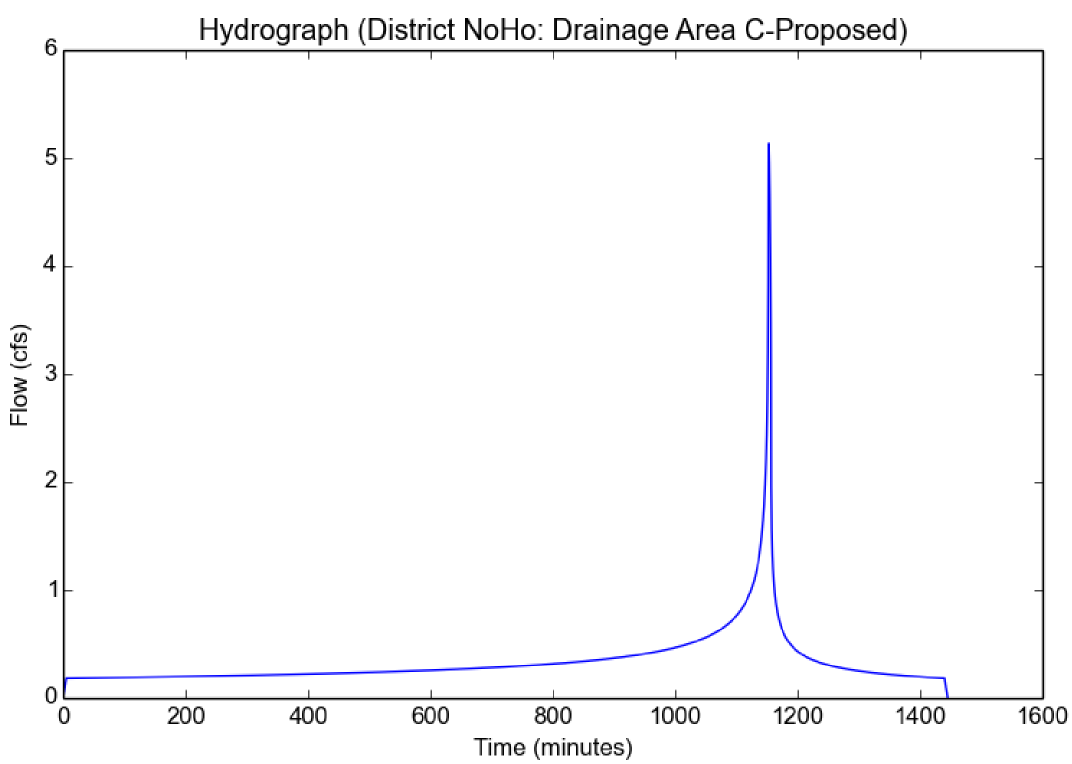
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area C-Proposed
Area (ac)	1.47
Flow Path Length (ft)	230.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.9
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8611
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.1353
Burned Peak Flow Rate (cfs)	5.1353
24-Hr Clear Runoff Volume (ac-ft)	0.6795
24-Hr Clear Runoff Volume (cu-ft)	29598.5527



Peak Flow Hydrologic Analysis

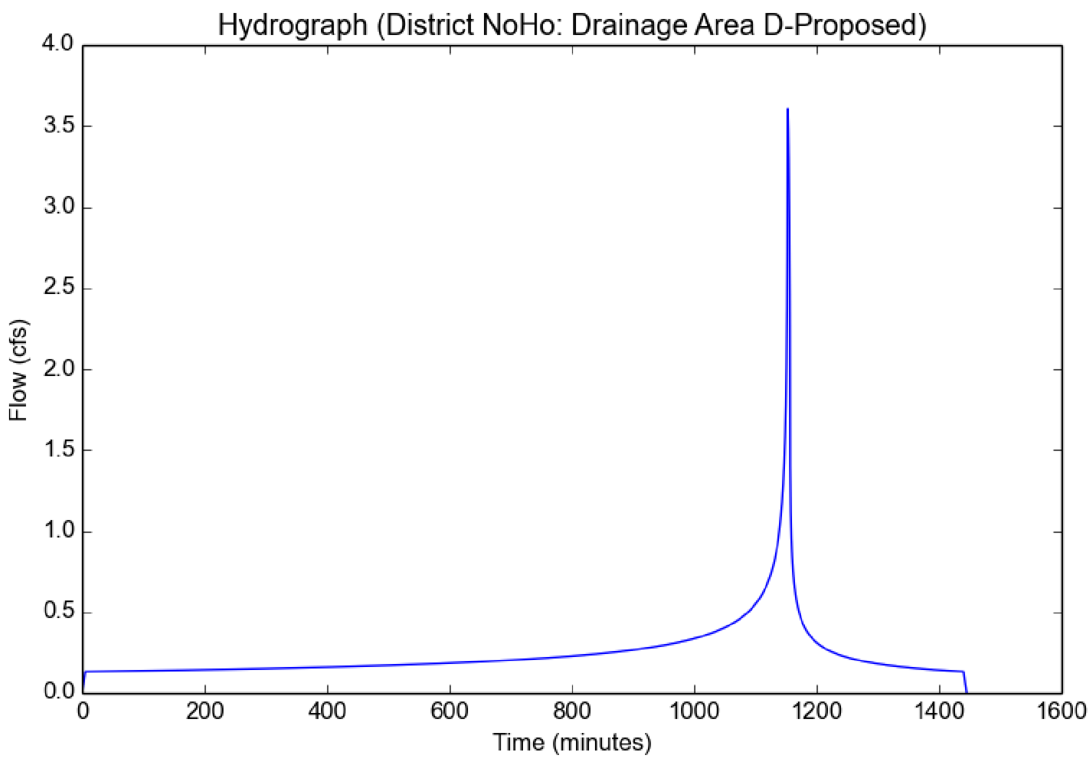
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area D-Proposed
Area (ac)	1.01
Flow Path Length (ft)	240.0
Flow Path Slope (vft/hft)	0.015
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.95
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8805
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.6081
Burned Peak Flow Rate (cfs)	3.6081
24-Hr Clear Runoff Volume (ac-ft)	0.4889
24-Hr Clear Runoff Volume (cu-ft)	21294.3738



Peak Flow Hydrologic Analysis

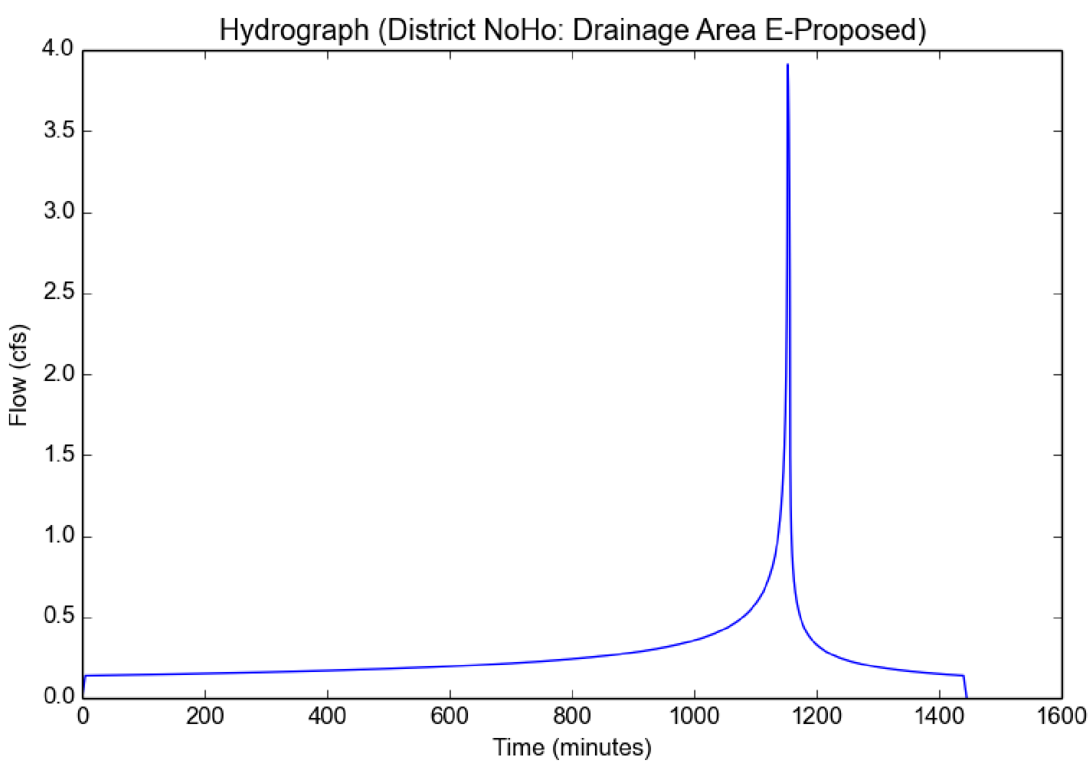
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area E-Proposed
Area (ac)	1.12
Flow Path Length (ft)	240.0
Flow Path Slope (vft/hft)	0.015
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.9
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8611
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.9126
Burned Peak Flow Rate (cfs)	3.9126
24-Hr Clear Runoff Volume (ac-ft)	0.5177
24-Hr Clear Runoff Volume (cu-ft)	22551.2783



Peak Flow Hydrologic Analysis

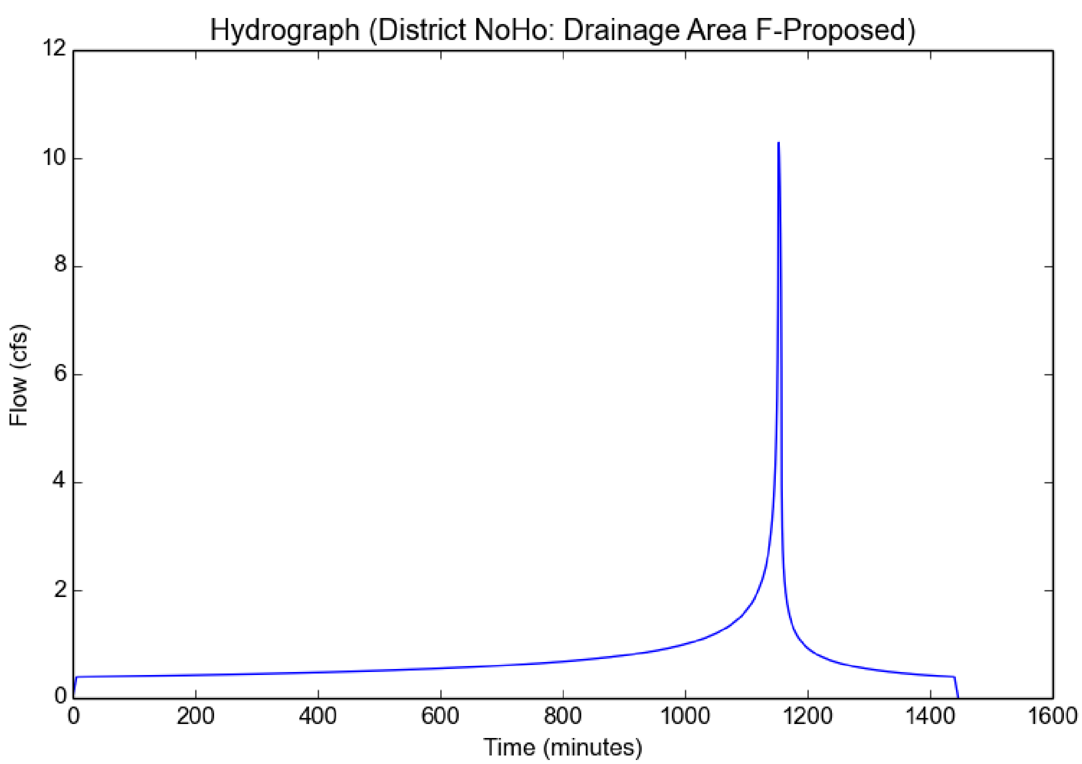
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area F-Proposed
Area (ac)	3.3
Flow Path Length (ft)	380.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.85
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.7239
Undeveloped Runoff Coefficient (Cu)	0.4799
Developed Runoff Coefficient (Cd)	0.837
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	10.2855
Burned Peak Flow Rate (cfs)	10.2855
24-Hr Clear Runoff Volume (ac-ft)	1.4533
24-Hr Clear Runoff Volume (cu-ft)	63307.3934



Peak Flow Hydrologic Analysis

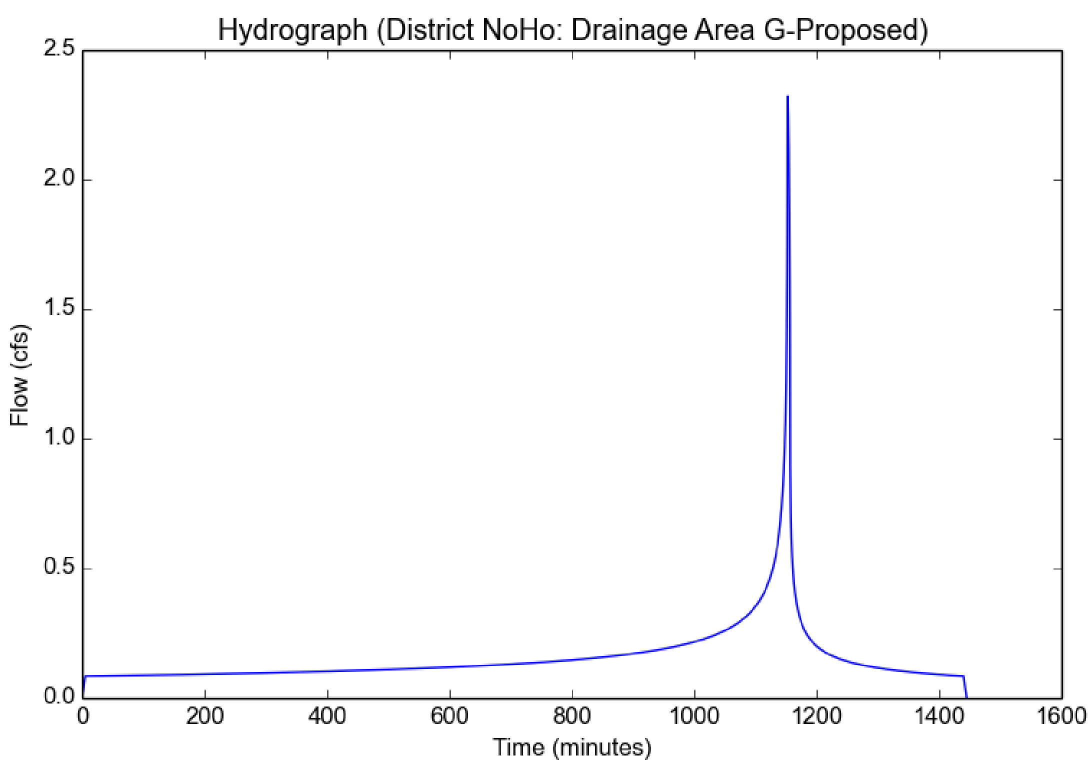
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area G-Proposed
Area (ac)	0.65
Flow Path Length (ft)	70.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.95
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8805
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.322
Burned Peak Flow Rate (cfs)	2.322
24-Hr Clear Runoff Volume (ac-ft)	0.3146
24-Hr Clear Runoff Volume (cu-ft)	13704.3



Peak Flow Hydrologic Analysis

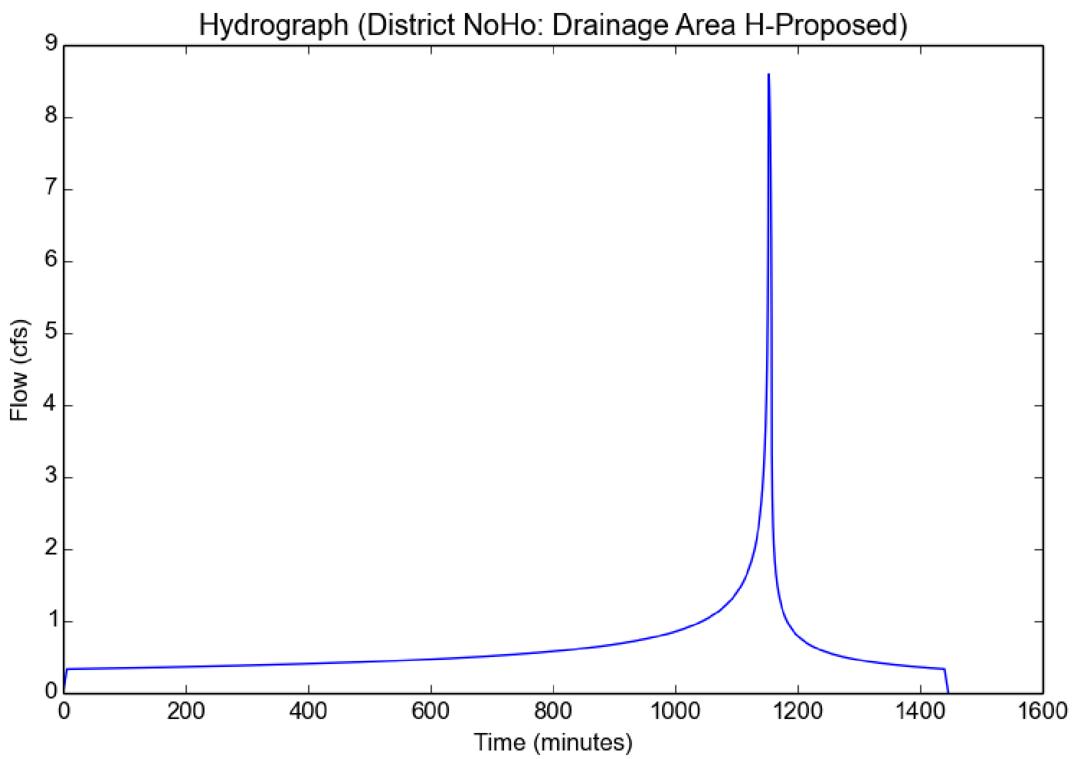
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area H-Proposed
Area (ac)	2.69
Flow Path Length (ft)	450.0
Flow Path Slope (vft/hft)	0.015
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.9
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.7239
Undeveloped Runoff Coefficient (Cu)	0.4799
Developed Runoff Coefficient (Cd)	0.858
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	8.5947
Burned Peak Flow Rate (cfs)	8.5947
24-Hr Clear Runoff Volume (ac-ft)	1.2433
24-Hr Clear Runoff Volume (cu-ft)	54158.7807



Peak Flow Hydrologic Analysis

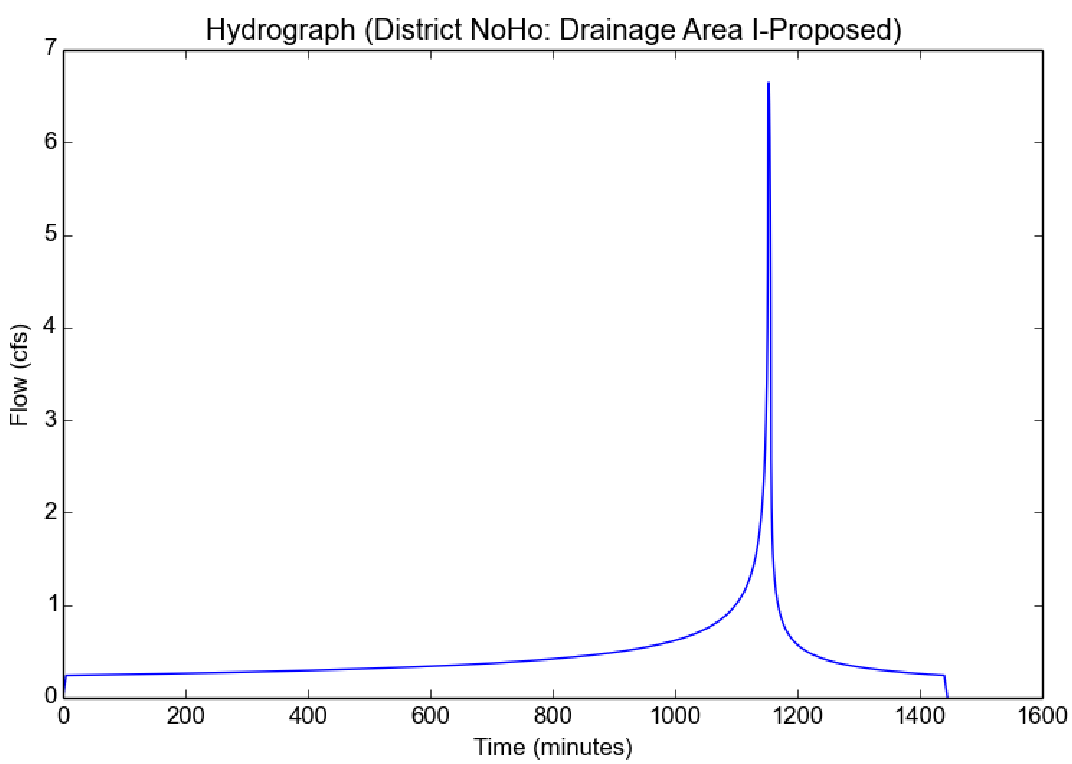
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	Drainage Area I-Proposed
Area (ac)	1.86
Flow Path Length (ft)	250.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.95
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8805
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.6446
Burned Peak Flow Rate (cfs)	6.6446
24-Hr Clear Runoff Volume (ac-ft)	0.9003
24-Hr Clear Runoff Volume (cu-ft)	39215.3814



Peak Flow Hydrologic Analysis

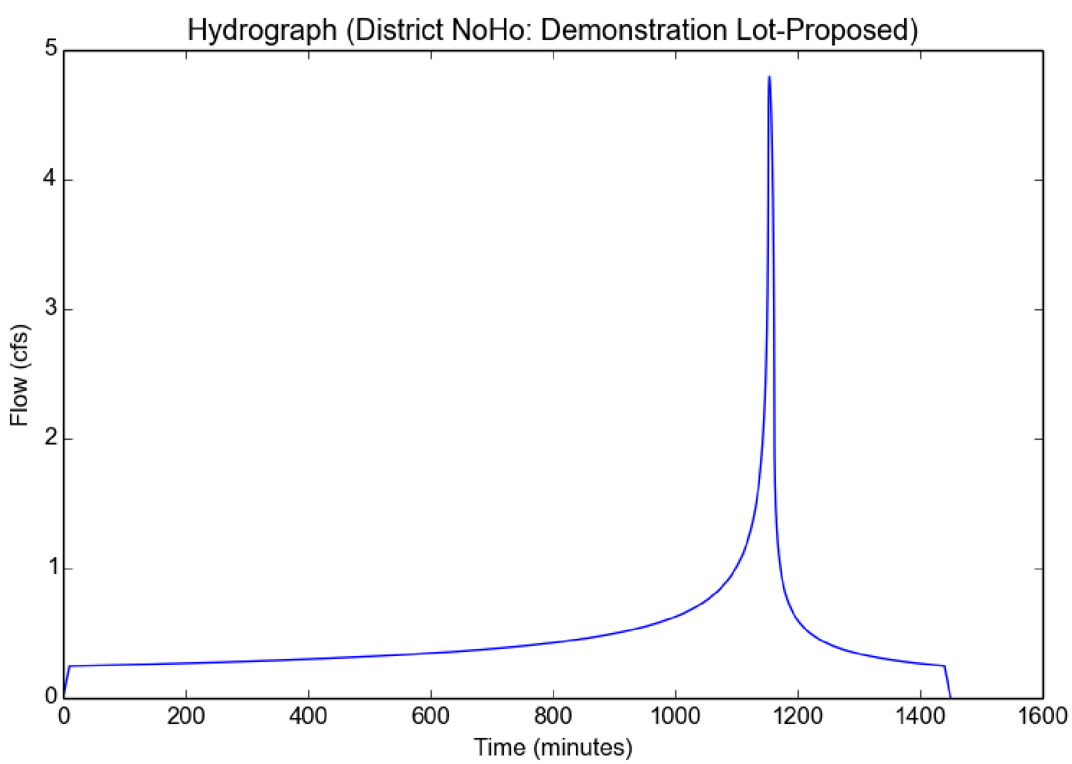
File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	East Lot-Proposed
Area (ac)	1.83
Flow Path Length (ft)	1000.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	2.9291
Undeveloped Runoff Coefficient (Cu)	0.4021
Developed Runoff Coefficient (Cd)	0.895
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	4.7975
Burned Peak Flow Rate (cfs)	4.7975
24-Hr Clear Runoff Volume (ac-ft)	0.9176
24-Hr Clear Runoff Volume (cu-ft)	39970.2169



Peak Flow Hydrologic Analysis

File location: P:/2017/1700732 Metro NoHo/ENGR/STORM/Hydrology/District NoHo Hydrology Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	District NoHo
Subarea ID	New West Lot-Proposed
Area (ac)	1.01
Flow Path Length (ft)	600.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.4636
Undeveloped Runoff Coefficient (Cu)	0.455
Developed Runoff Coefficient (Cd)	0.8955
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	3.1329
Burned Peak Flow Rate (cfs)	3.1329
24-Hr Clear Runoff Volume (ac-ft)	0.5064
24-Hr Clear Runoff Volume (cu-ft)	22060.4252

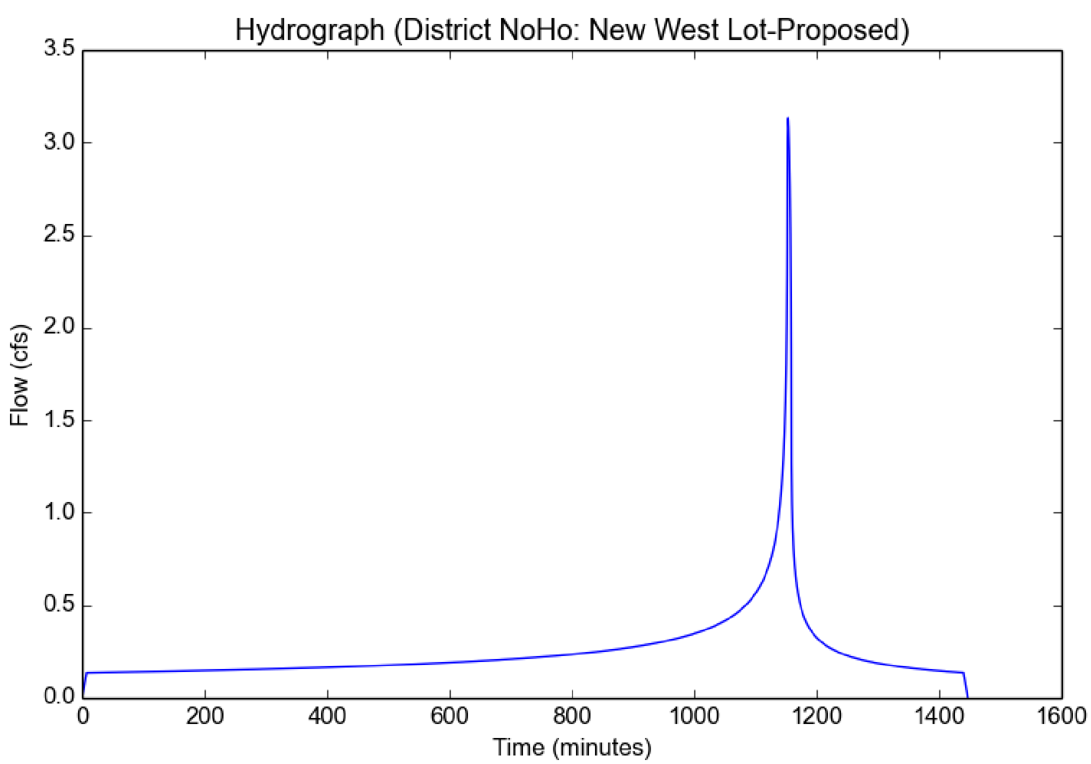
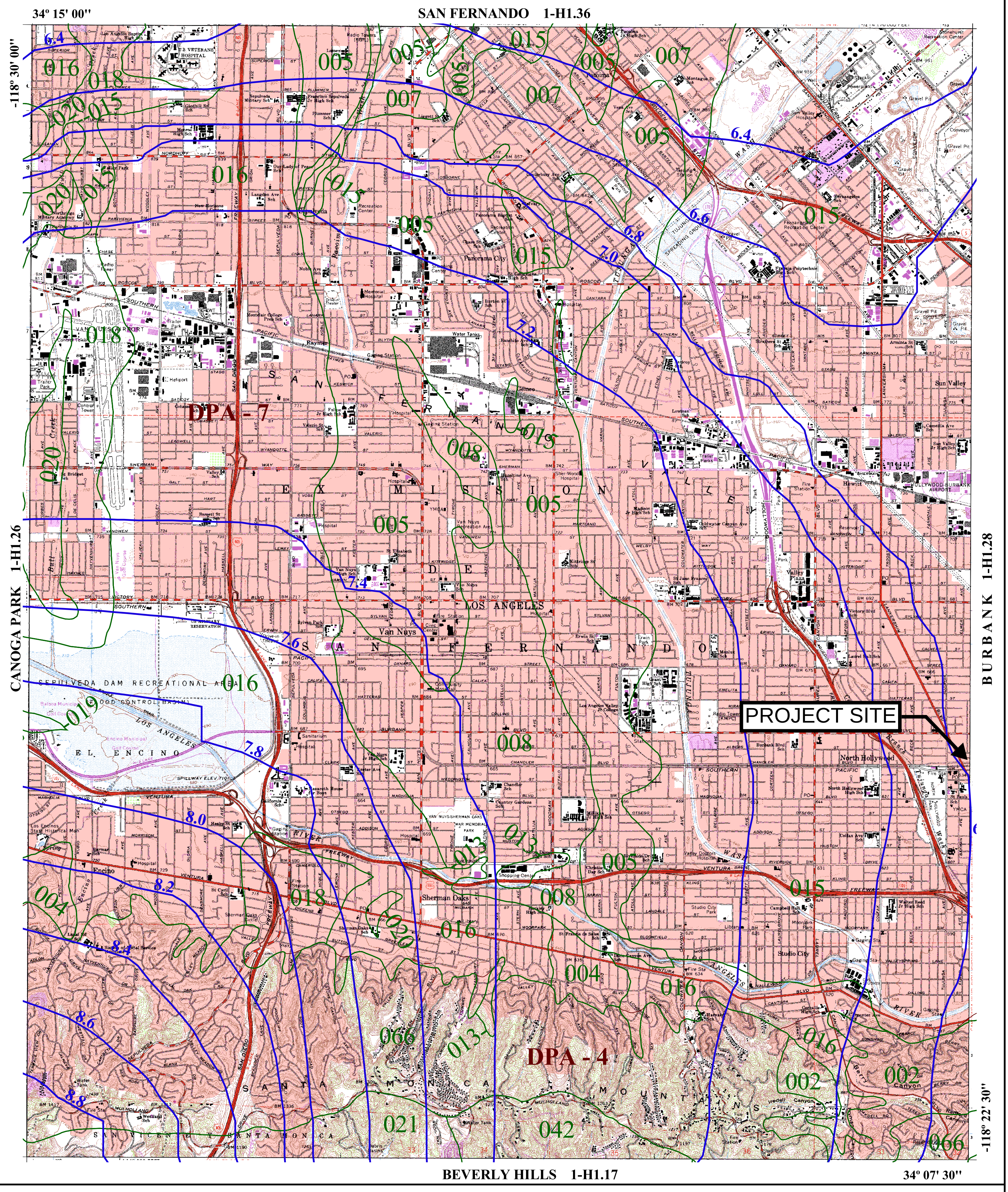


FIGURE 5 - RAINFALL ISOHYETS



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878

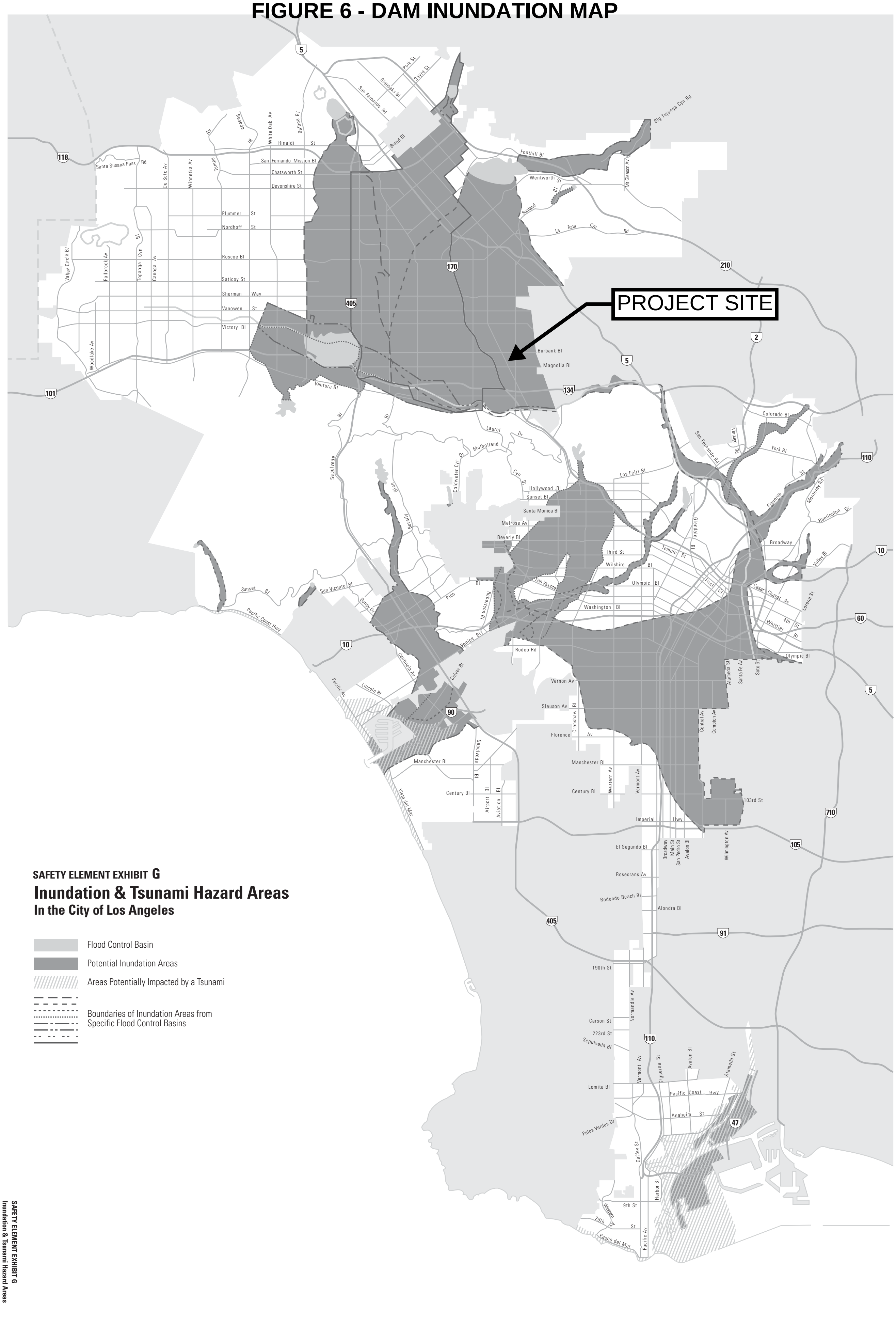
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

VAN NUYS
50-YEAR 24-HOUR ISOHYET

1-H1.27

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

FIGURE 6 - DAM INUNDATION MAP



SAFETY ELEMENT EXHIBIT G
Inundation & Tsunami Hazard Areas

Sources: Environmental Impact Report, Framework Element, Los Angeles City General Plan, May 1995; Technical Appendix to the Safety Element of the Los Angeles County General Plan Hazard Reducation in Los Angeles County, Volume 2, Plate 6, "Flood and Inundation Hazards" January 1990; California Environmental Quality Act of 1970 (CEQA), Public Resources Code Section 21000 *et. seq.* with guidelines as amended, 1992; California Government Code Title 7 chapter 3, article 5 section 65302(g), as amended 1993.

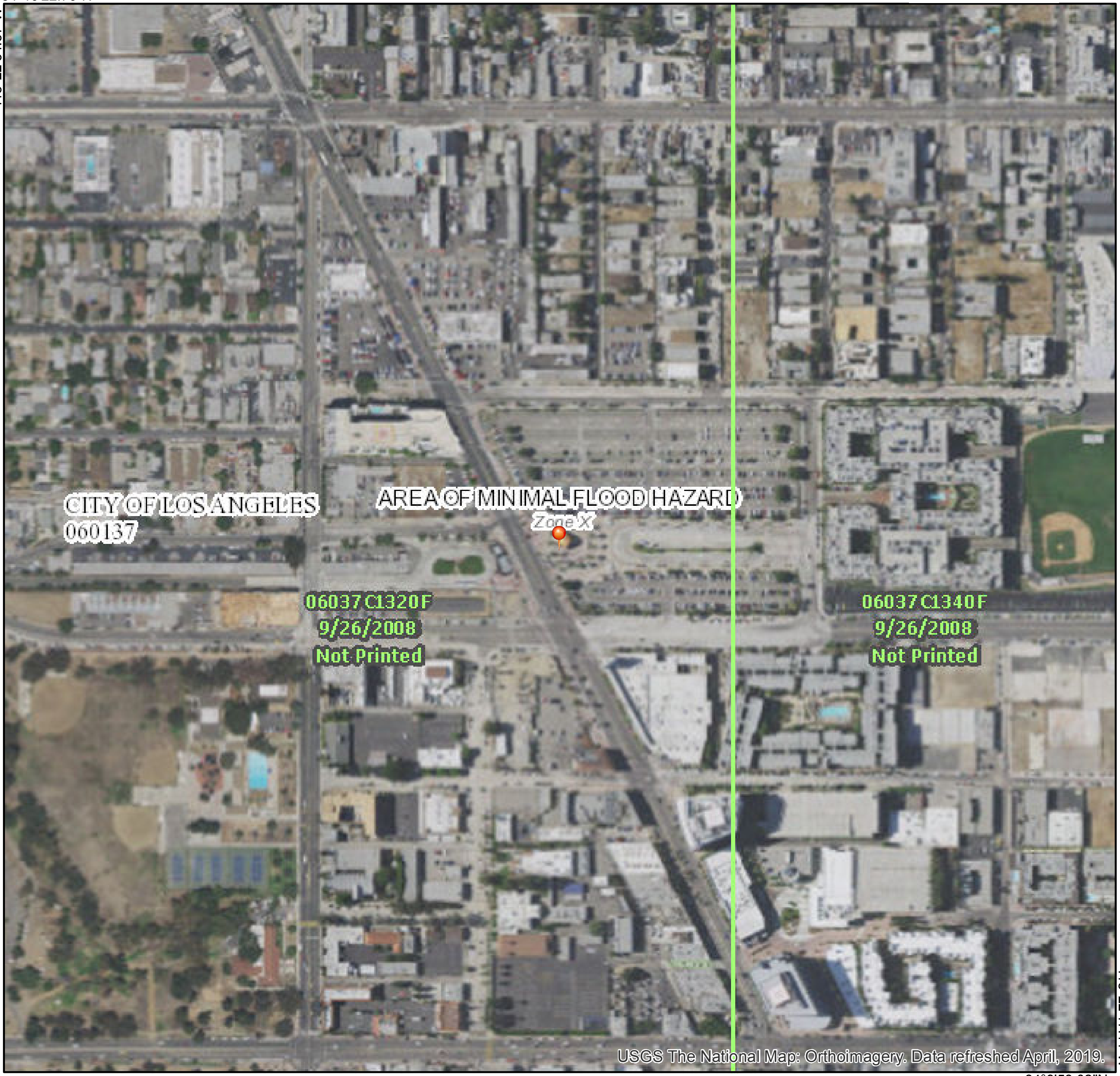
Prepared by the General Plan Framework Section • City of Los Angeles Planning Department • Citywide Graphics • March, 1994 • Council File No. 89-2104

National Flood Hazard Layer FIRMette

FEMA

34°10'22.79"N

118°22'54.57"W



118°22'17.11"W

34°9'53.02"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

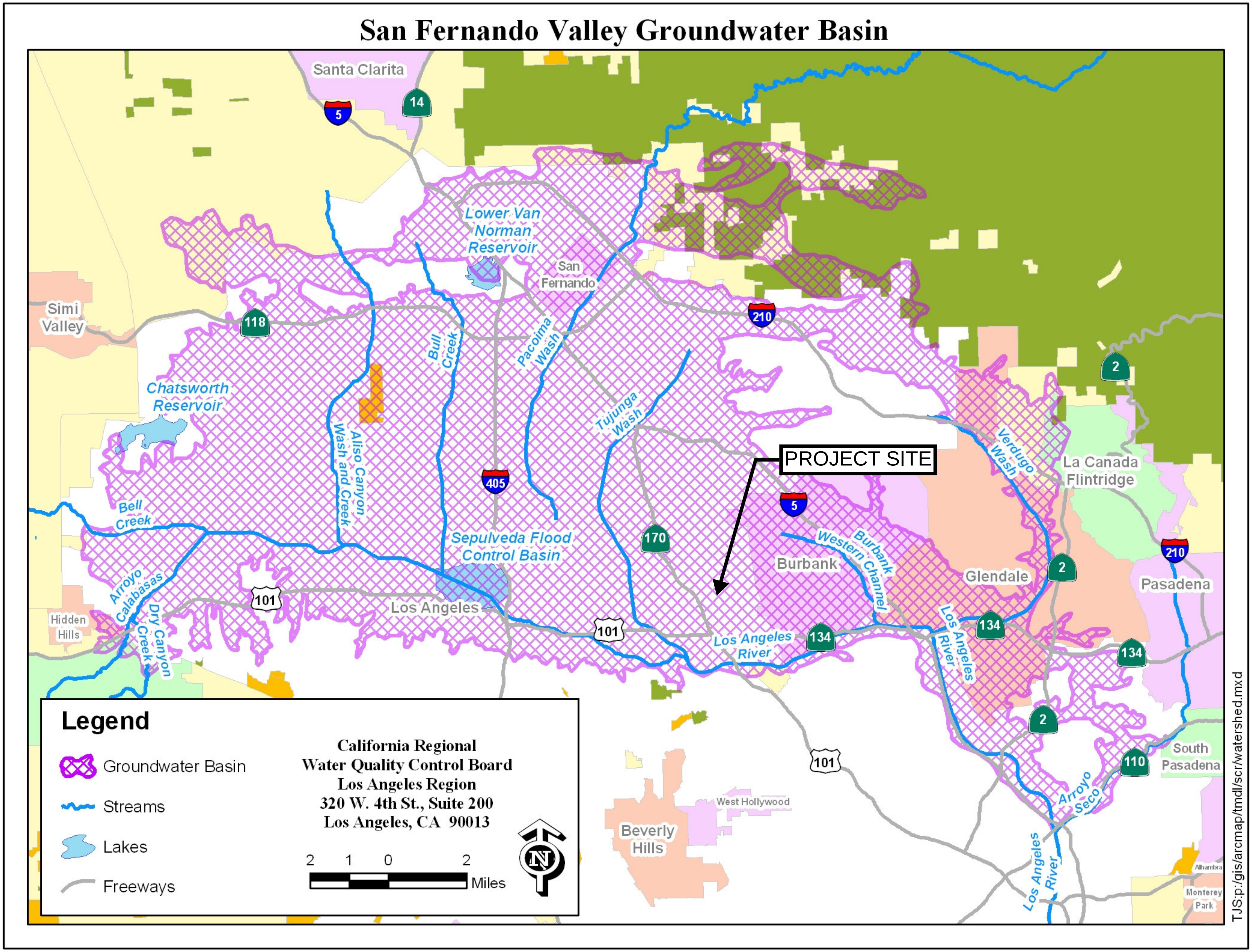
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/27/2019 at 7:35:34 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

FIGURE 8 - SAN FERNANDO VALLEY GROUNDWATER BASIN MAP



SFV GW BasinOverview

FIGURE 9 - LOS ANGELES RIVER WATERSHED
COUNTY OF LOS ANGELES

LOS ANGELES RIVER WATERSHED

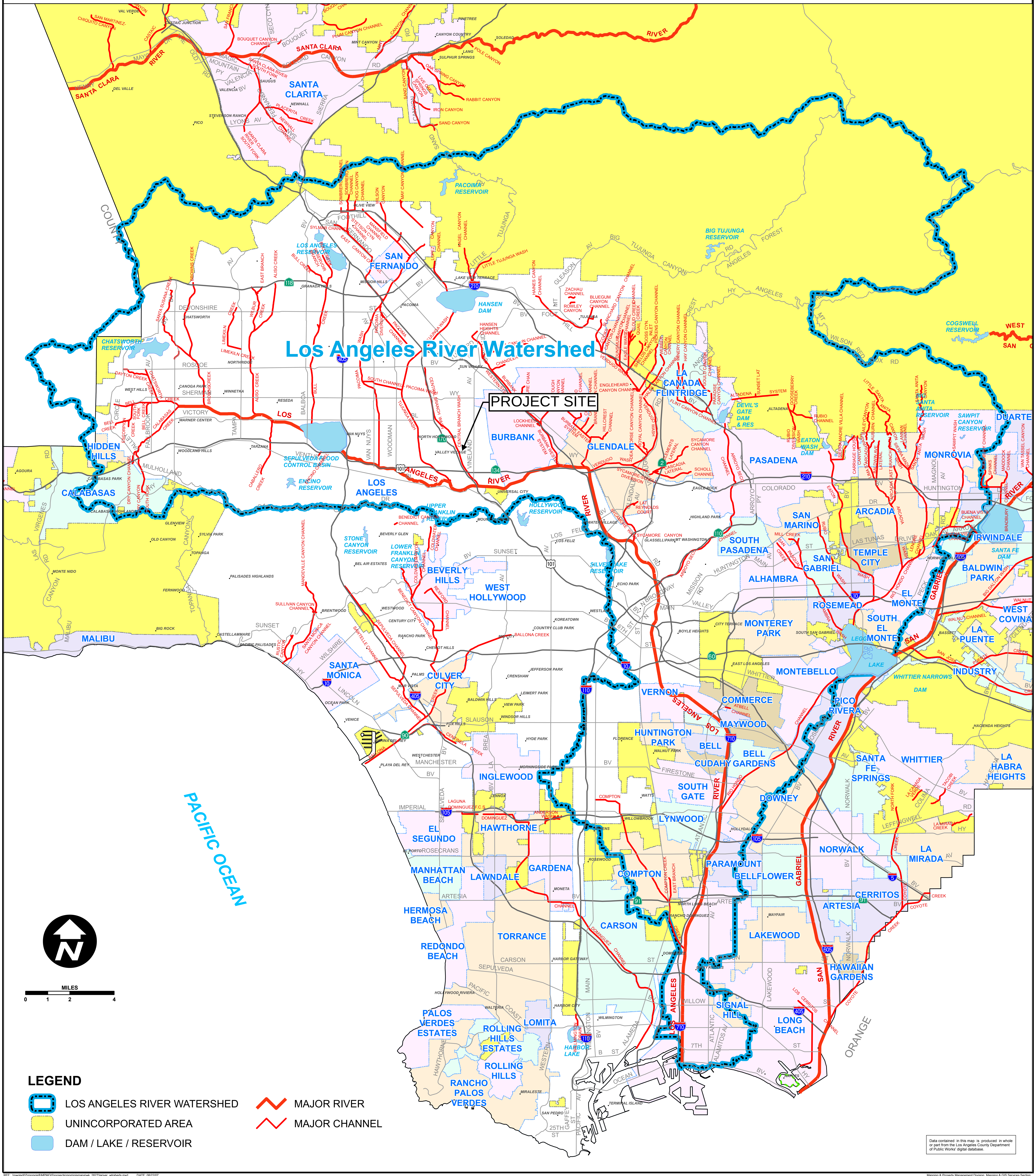
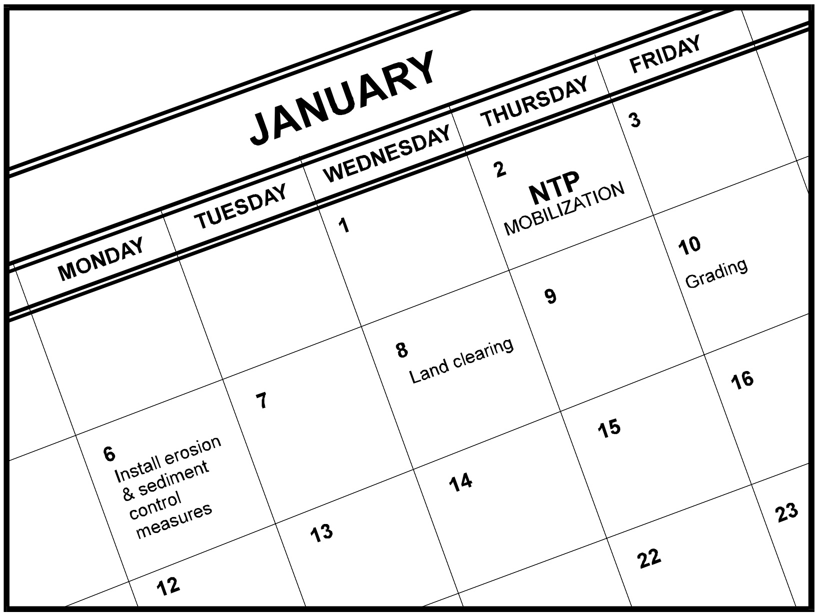


Figure 10: Typical SWPPP BMPs

Scheduling EC-1



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

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**

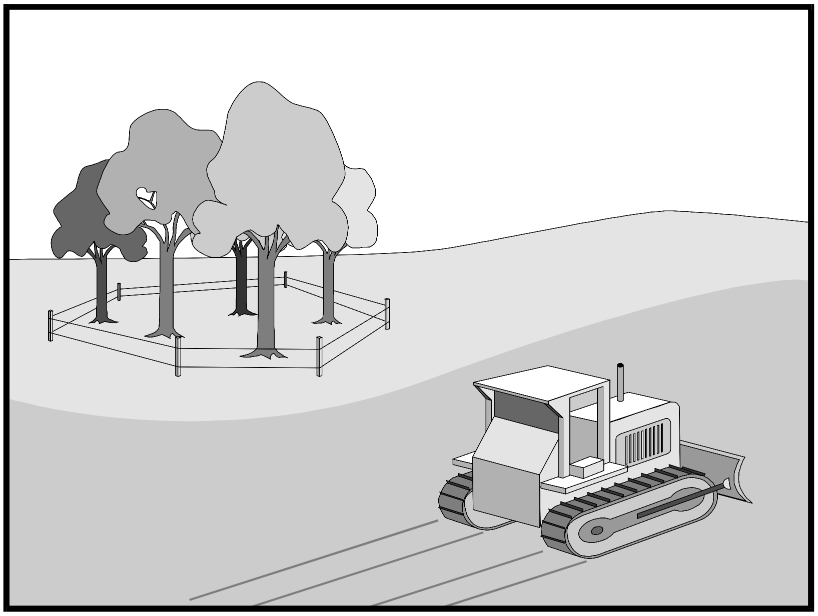
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Preservation Of Existing Vegetation EC-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 Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

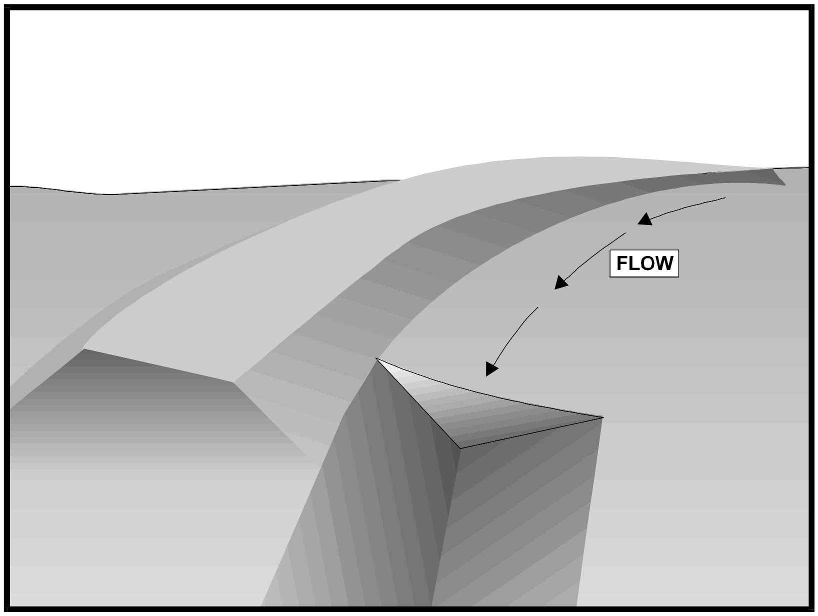
Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

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.

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**

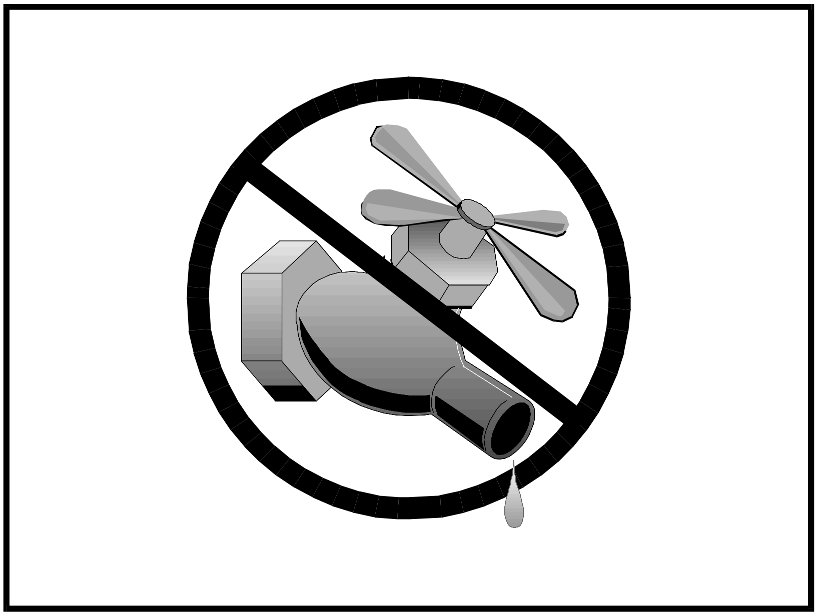
Targeted Constituents

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

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.

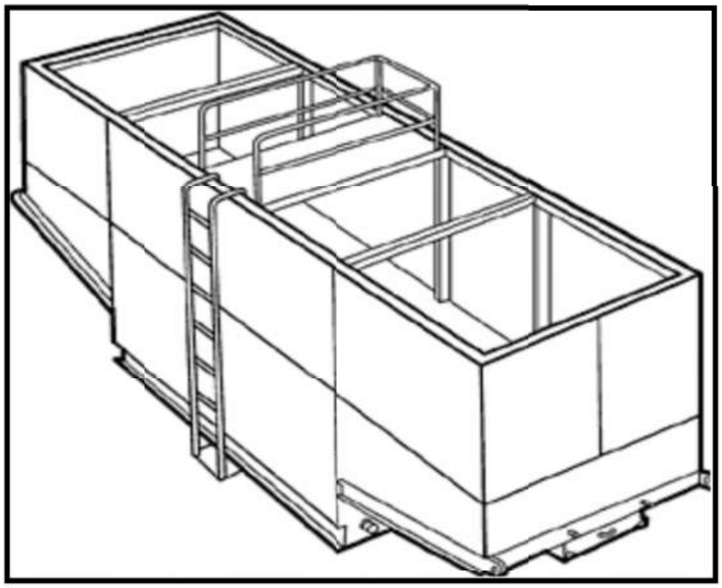
Limitations

- 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.

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

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.

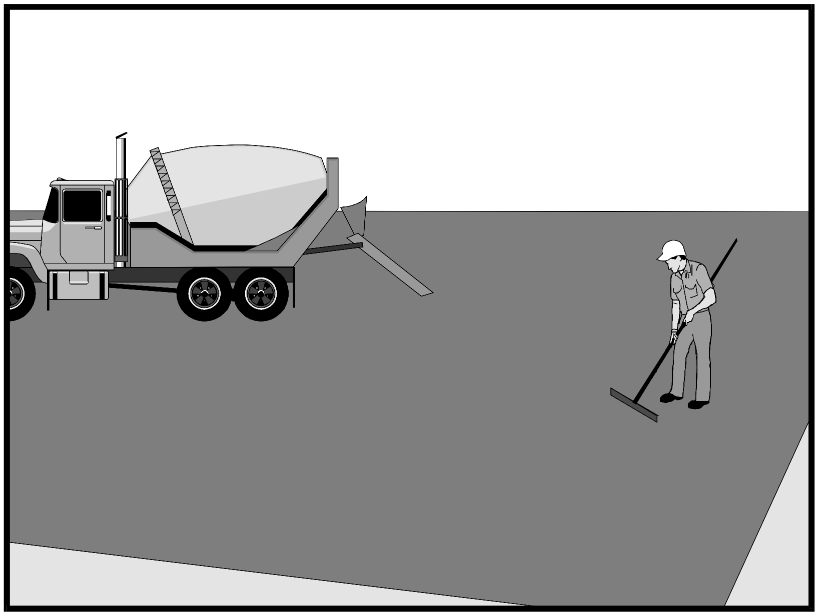
The dewatering operations described in this fact sheet are not Active Treatment Systems (ATS) and do not include the use of chemical coagulations, chemical flocculation or electrocoagulation.

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

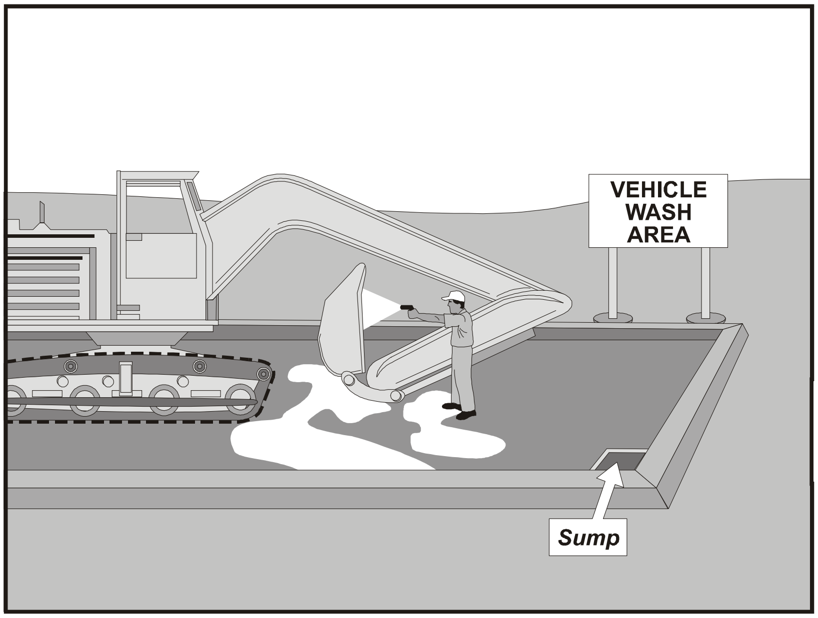
These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

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

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

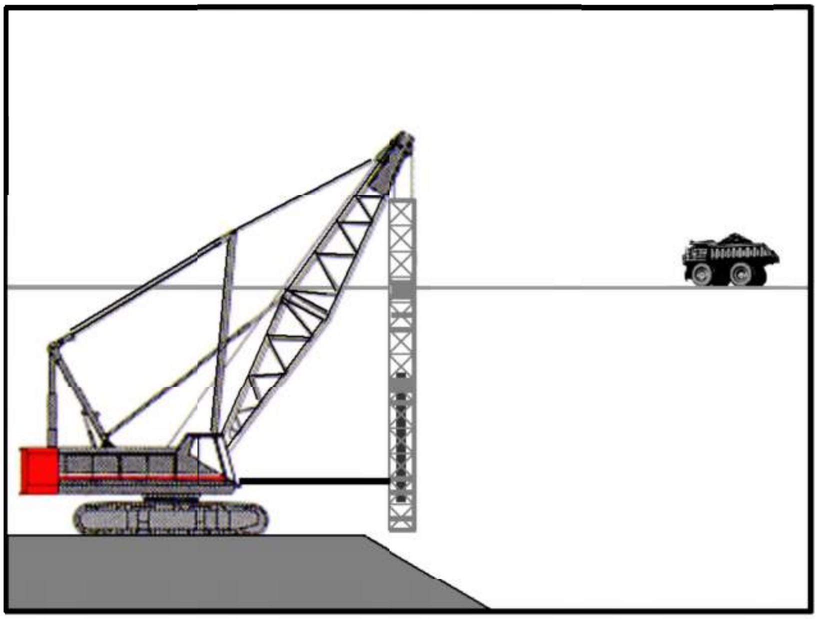
Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

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:

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

If User/Subscriber modifies this fact sheet in any way, the CASQA name/logo and footer below must be removed from each page and not appear on the modified version.

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

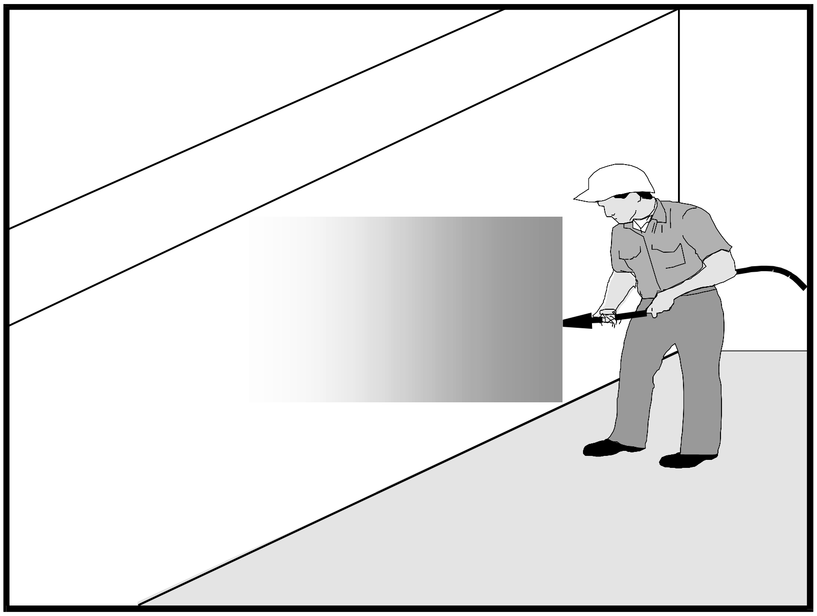
None identified.

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.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

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

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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.

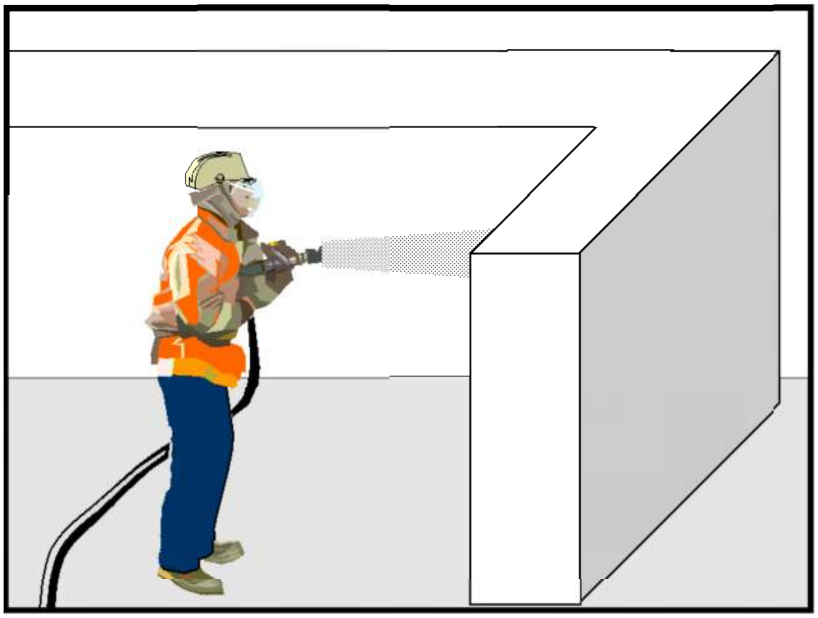
Suitable Applications

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

If User/Subscriber modifies this fact sheet in any way, the CASQA name/logo and footer below must be removed from each page and not appear on the modified version.

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).

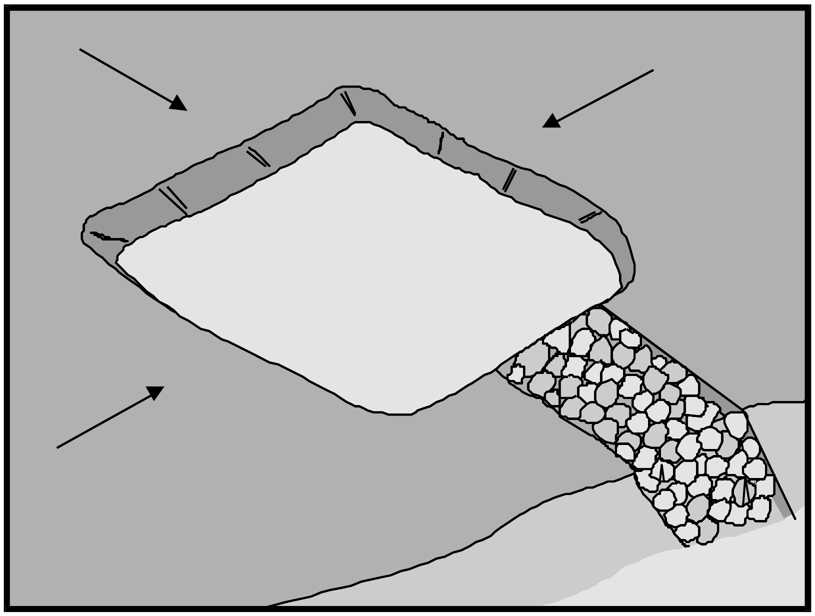
Concrete and its associated curing materials have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General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

Suitable Applications

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

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

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.

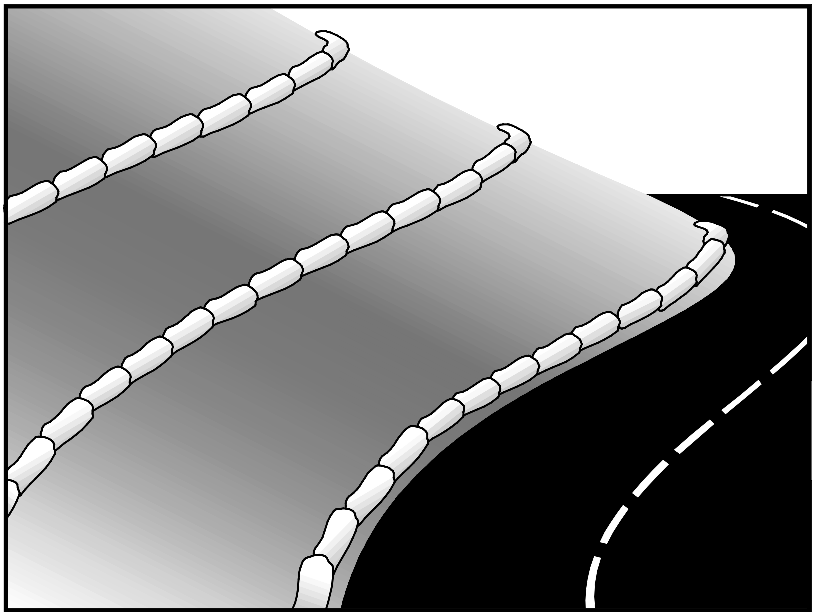
Trap design guidance provided in this fact sheet is not intended to guarantee compliance with numeric discharge limits (numeric action levels or numeric effluent limits for turbidity). Compliance with discharge limits requires a thoughtful approach to comprehensive BMP planning, implementation, and maintenance. 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

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).

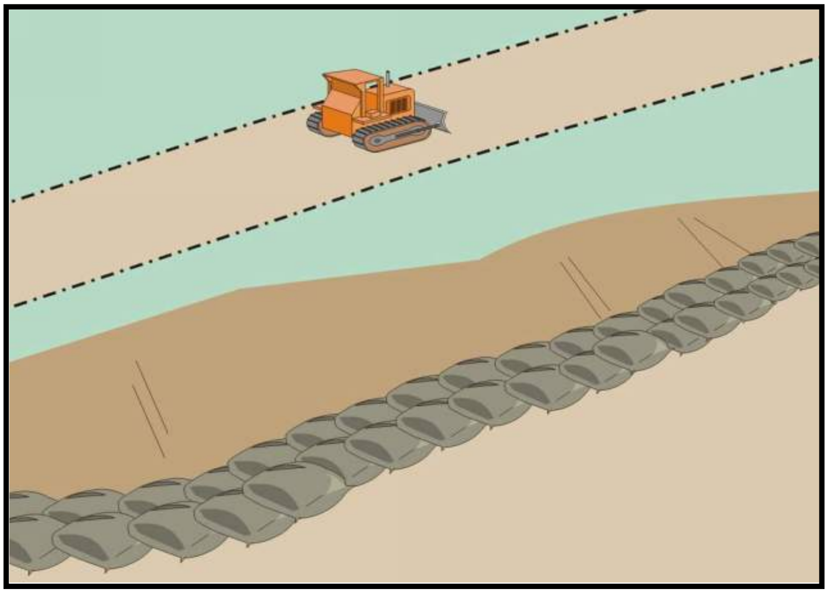
Implementation

- 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.

Sandbag Barrier



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-12 Manufactured Linear Sediment Controls

SE-14 Biofilter Bags

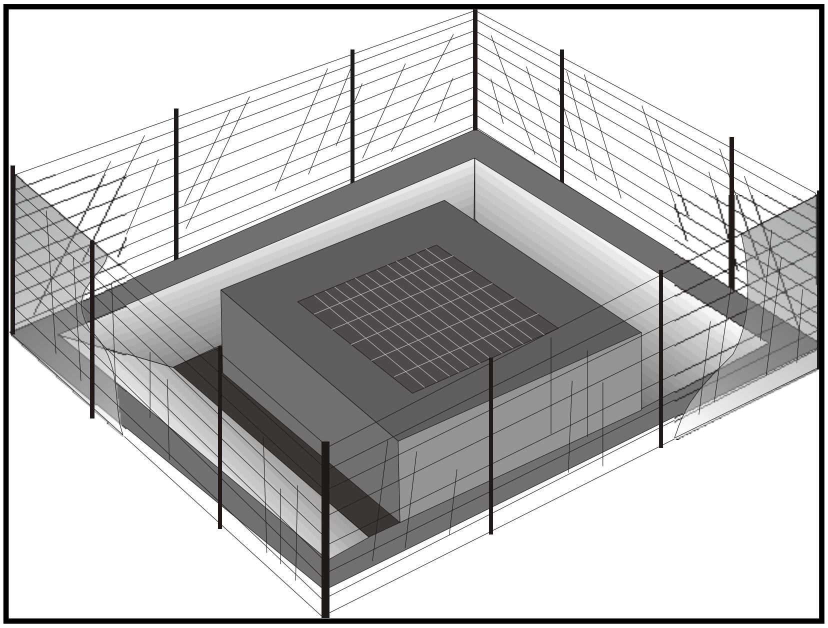
Description and Purpose

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.



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

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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.

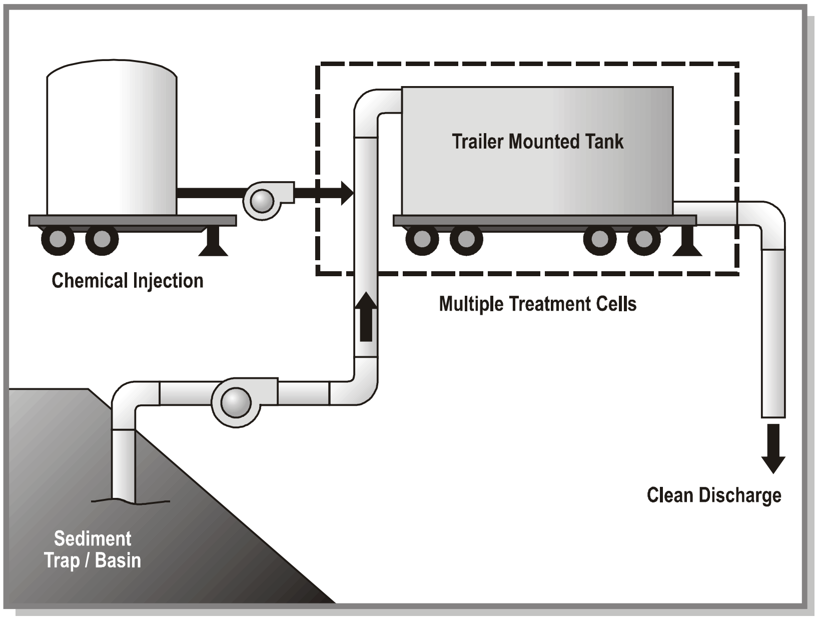
Suitable Applications

- 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

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.

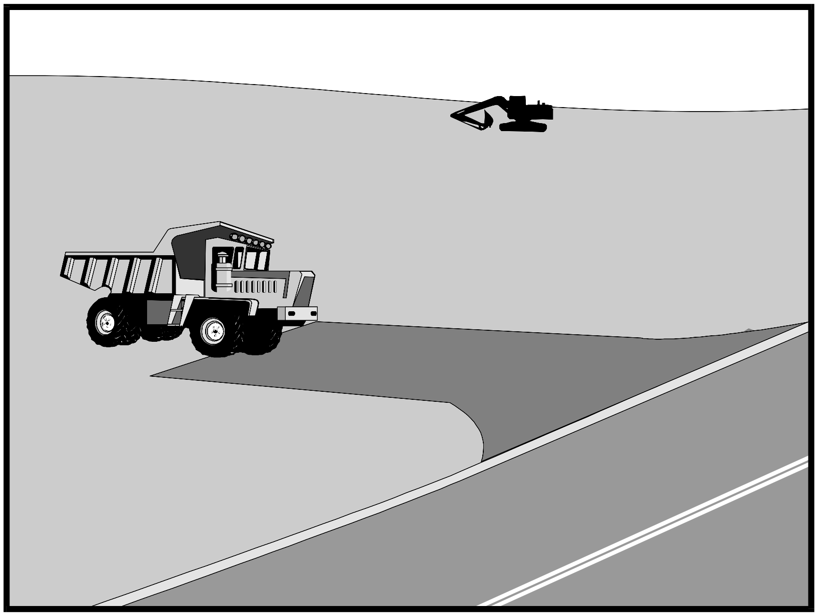
Suitable Applications

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**

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

Potential Alternatives

None

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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

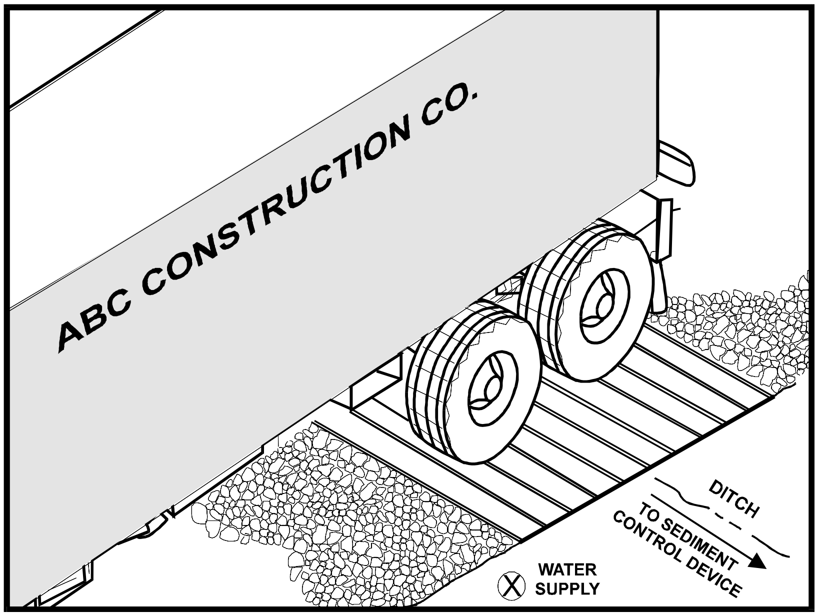
Use at construction sites:

- 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.

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**

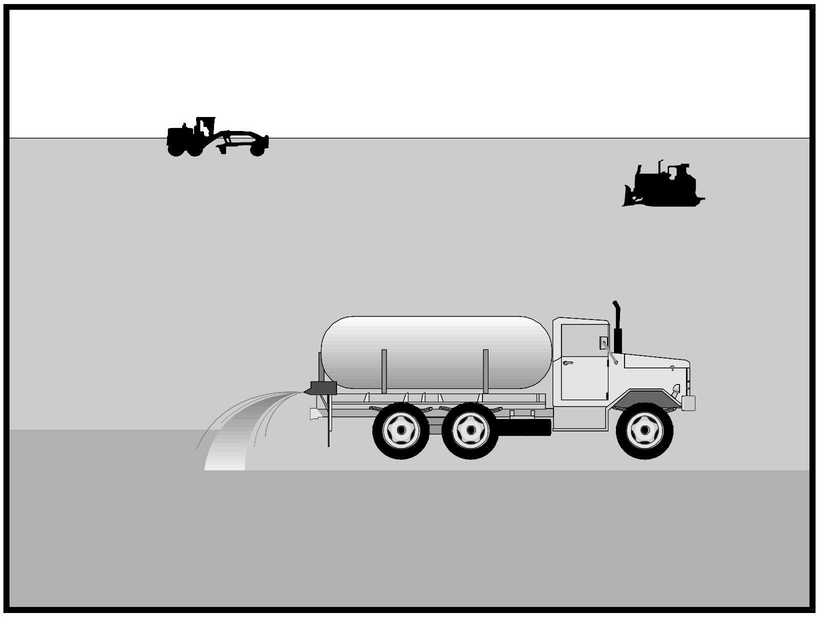
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

TC-1 Stabilized Construction Entrance/Exit



Categories

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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

Description and Purpose

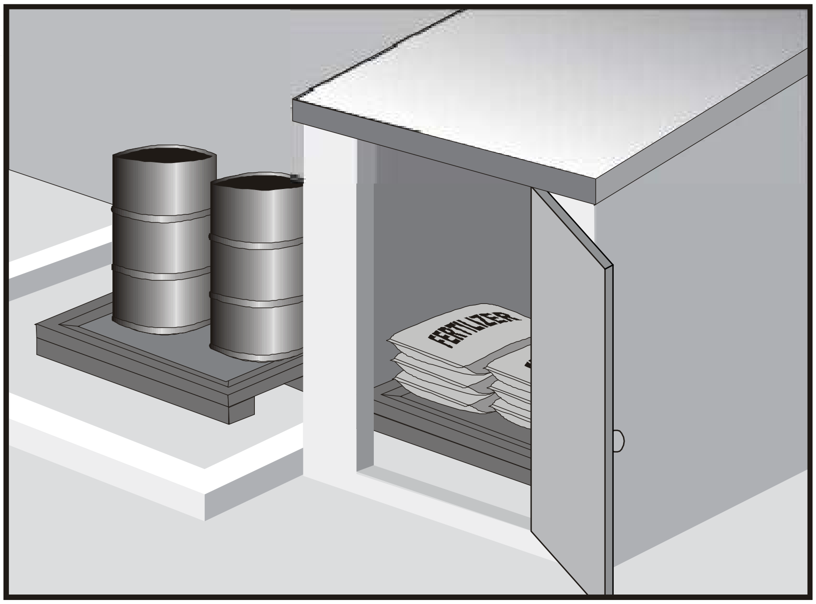
Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

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:

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**

Targeted Constituents

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

Potential Alternatives

None

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Description and Purpose

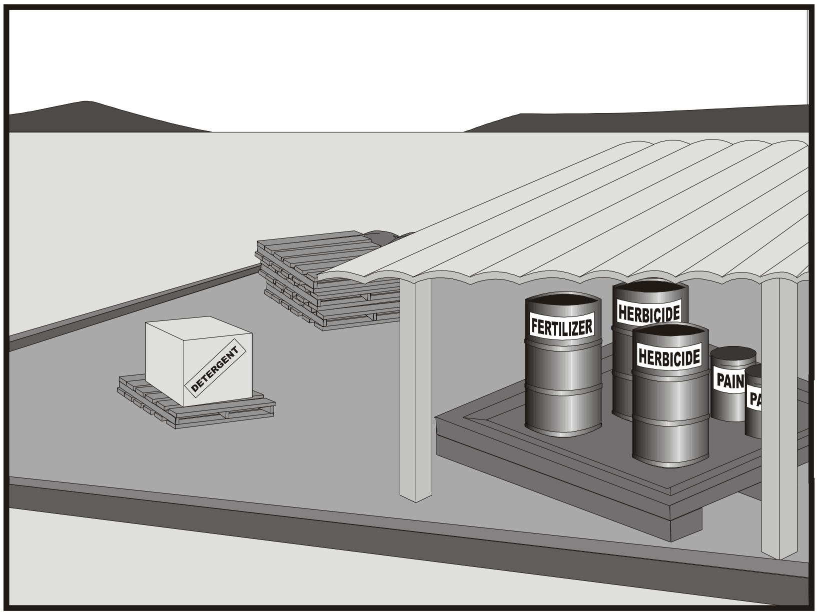
Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed designated area, installing secondary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



Categories		
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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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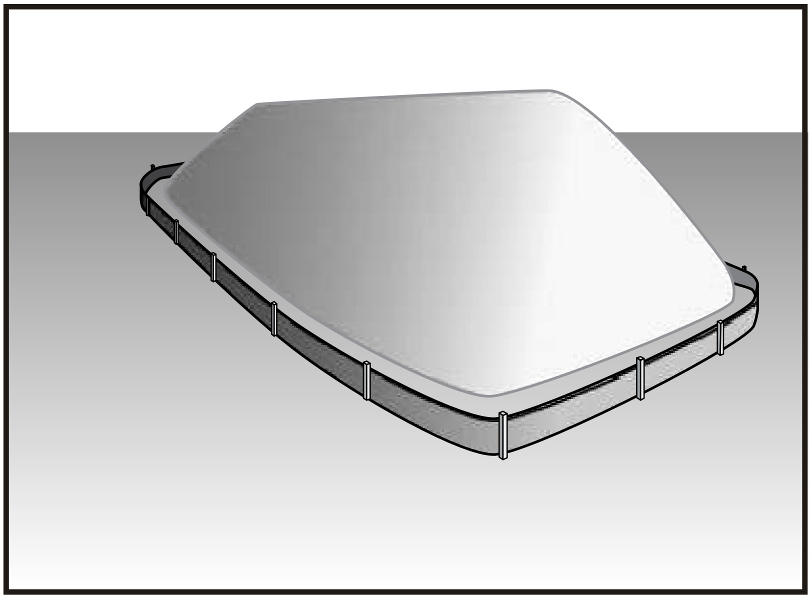
Description and Purpose

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

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

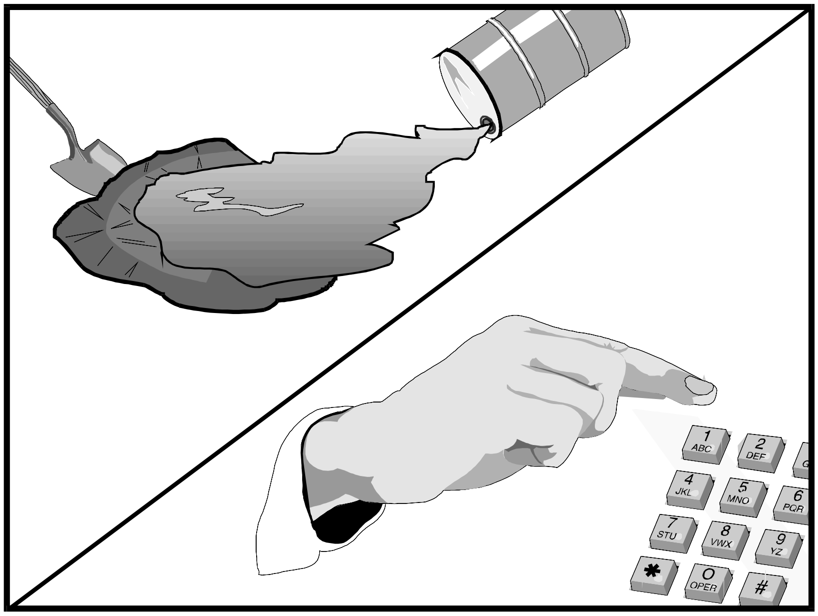
Implement in all projects that stockpile soil and other loose materials.

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:



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

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.

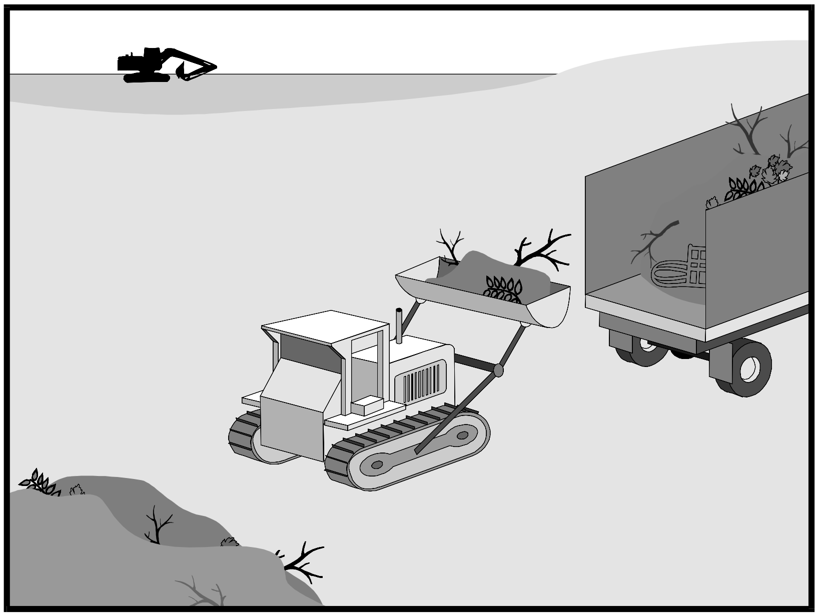
This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

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

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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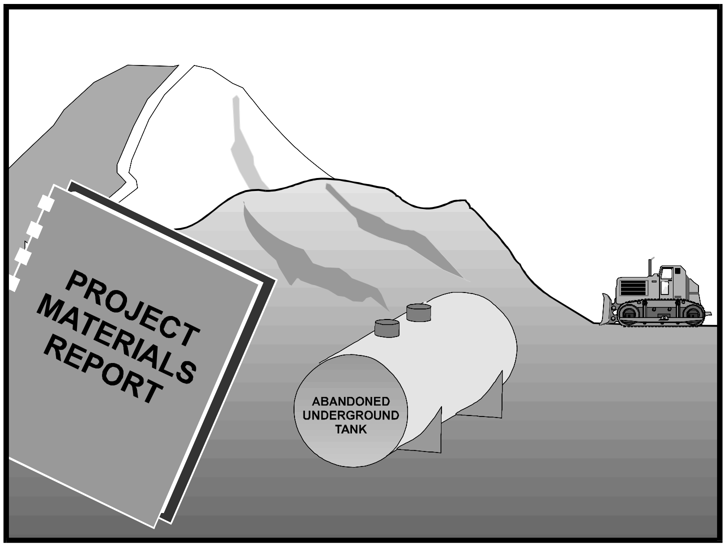
Description and Purpose

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



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

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**

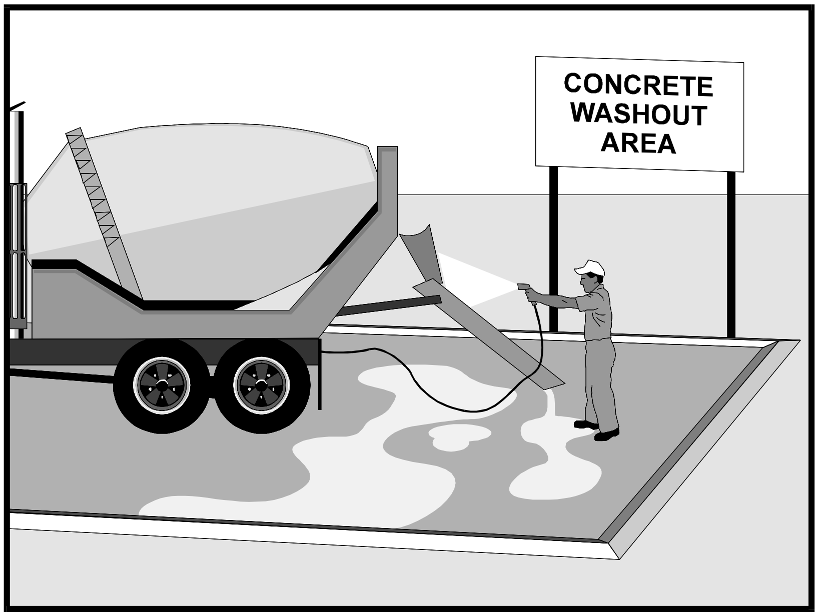
Targeted Constituents

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

Potential Alternatives

None

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

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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.

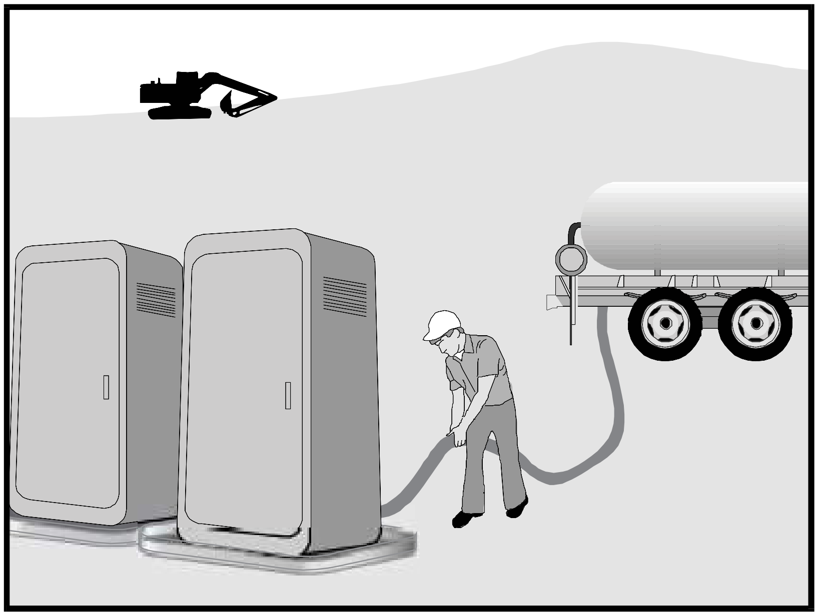
The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

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.



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

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.

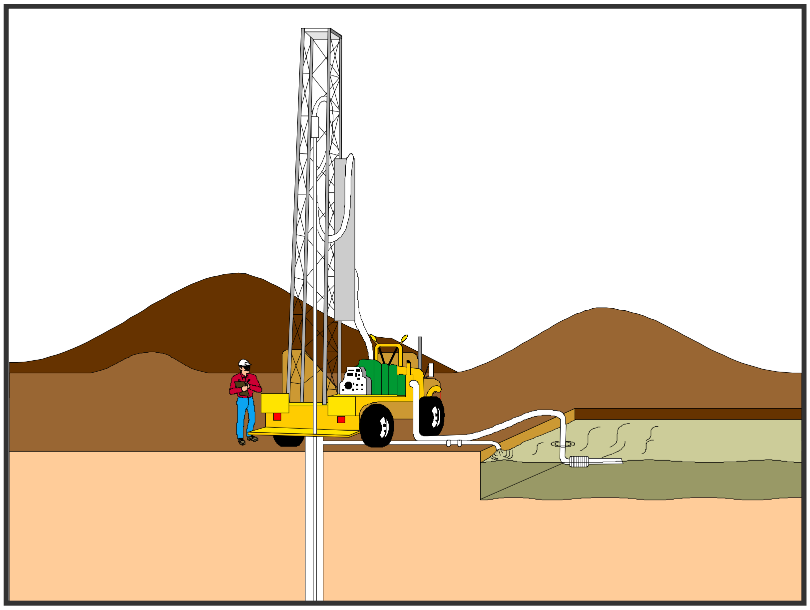
Implementation

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



Categories		
EC	Erosion Control	
SE	Sediment Control	
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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

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