# APPENDIX H

## Hydrology and Water Quality Report

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# 670 Mesquit Street
# Hydrology and Water Quality Report
# April 15, 2021

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**Appendix**

# 1. INTRODUCTION

RCS VE LLC (the Applicant) proposes to construct a new mixed-use development (Project) totaling approximately 1,792,103 square feet of floor area on an approximately 5.45-acre property at 670 Mesquit Street in the Arts District of Downtown Los Angeles.

The Project Site flanks Mesquit Street between the former 6th Street Viaduct right-of-way on the north and the 7th Street Bridge on the south. The majority of the Project Site is on the east side of Mesquit Street; the southern portion of the Project Site also includes parcels on the west side of Mesquit Street at 7th Street. As part of the Project, the entirety of Mesquit Street is proposed for vacation between 6th and 7th Streets; although only the half right-of-way along the property frontage would be absorbed into the Project Site.

Project implementation would require the removal of all existing on-site uses, including warehouses containing freezers, coolers, dry storage, and associated office space, totaling approximately 205,393 square feet of floor area. New development would include creative office space (approximately 944,050 square feet); a 236-room hotel; 308 multifamily residential housing units; an Arts District Central Market, a grocery store, and general retail uses totaling approximately 136,152 square feet; restaurants totaling approximately 89,576 square feet; studio/event/gallery space and a potential museum totaling approximately 93,617 square feet; and a gym of approximately 62,148 square feet. Buildings would range between 84 feet to 378 feet tall. The resulting floor area ratio would be approximately 7.5:1, assuming the proposed Mesquit Street vacation.

The Project would provide open space for use by Project residents, hotel guests, employees, and visitors totaling approximately 141,876 square feet. Proposed open space features include at-grade landscaped areas, pedestrian passageways and walkways, viewing platforms, and above-grade landscaped terraces and pool decks. The Applicant also seeks to construct a Deck over the Railway Properties east of the Project Site if agreements can be obtained with Railway Property owners. The Deck would serve as a connection between the 7th Street Bridge and the Project Site's Northern Landscaped Area, which would provide access to the City's proposed PARC Improvements. The Deck could also provide access directly to the Los Angeles River.

The Project would include up to four levels of below grade parking spanning the entire building footprint and above grade parking at the southern end of the Project Site.

Construction of the Project would involve site preparation activities including mass excavation and grading. The excavation depth would range from approximatively 61 to 68 feet below ground surface (bgs) for the lowest subterranean parking level. To accommodate elevator pits, maximum excavations would range in depth from approximately 71 to 75 feet bgs in isolated areas. An estimated 531,319 cubic yards would be excavated and exported off site.

Project construction is anticipated to commence as early as 2021 and be completed as early as 2026, in a single phase, or as late as 2040 if built in separate phases over time. In the event construction is phased, construction of below-grade parking may also be phased.

The purpose of this report is to evaluate changes to surface water and groundwater at the Project Site, assuming the street vacation and Deck described above are implemented.

# 2. ENVIRONMENTAL SETTING

## 2.1. SURFACE WATER HYDROLOGY

### 2.1.1. REGIONAL

As illustrated on Figure 8, the Project Site is located within the Los Angeles River Watershed Reach 2 (from Carson to Figueroa Street) in the Los Angeles Basin. The Watershed encompasses an area of approximately 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%). The 55-mile long Los Angeles River originates in western San Fernando Valley and flows through the central portion of the city south to San Pedro Bay near Long Beach. Most portions of the Los Angeles River are completely channelized for flood protection, as are many of its tributaries including Compton Creek, Rio Hondo, Arroyo Seco, and Tujunga Wash. They are fed by a complex underground network of storm drains and a surface network of tributaries.

### 2.1.2. PROJECT SITE

Under existing conditions, the Project Site is divided into five drainage areas, which are described below and shown in Figure 2.[1] These drainage areas are determined by the drainage patterns and flow paths of stormwater that are tributary to a common point or area.

- Drainage from Area A, the southeastern and southwestern portions of the Project Site (south of Jesse Street), is directed via building roof drains and sheet flow into an existing grate inlet catch basin at the southern end of Mesquit Street, on the western side of the street.

- Drainage from Area B, the eastern edge of the Project Site facing the railway property, is directed via building roof drains and sheet flow east onto the railway property.

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[1] The drainage areas tributary to each discharge point or area were determined from a topographical survey and site observations.

- Drainage from Area C, the central portion of the Project Site between Jesse Street on the south and the LADWP Property on the north, and fronting on Mesquit Street, is directed via building roof drains and surface flow to grate inlet catch basins on the east side of Mesquit Street, north of Jesse Street.

- Drainage from Area D, the small area encompassing the northern end of the Project Site fronting on Mesquit Street, is directed via sheet flow into an existing side inlet catch basin near the northern end of Mesquit Street, on the eastern side of the street.

- Area E is the off-site area east of the Project Site encompassing the portion of the Deck which the Applicant seeks to construct within the railway property if agreements can be obtained with railway property owners and financing and other funding becomes available. Drainage from Area E sheet flows directly into the Los Angeles River.

The Site consists of impervious surfaces including buildings and impervious pavement for pedestrian and vehicular circulation. It also consists of pervious areas including an approximate 0.65-acre dirt lot area located on the northeast part of the Project Site and 3.01 acres of the adjacent railway property. The existing Project Site supplemented by the proposed Mesquit Street vacation and Deck areas is approximately 58% impervious. A summary of existing impervious conditions is found in Table 1a and Table 1b below.

Generally, the portion of the Project Site occupied by existing buildings is relatively flat and slopes downward from north to south by approximately three feet over approximately 1,000 linear feet[2].

Figure 4 shows all the input parameters used for analyzing the existing Site. Table 1a shows the existing volumetric flow rates and volumes generated by a 50-year storm event within the proposed project boundary. Table 1b shows the existing volumetric flow rates and volumes generated by a 50-year storm event within the proposed project with deck boundary.

| Table 1a- Existing Drainage Stormwater Runoff Calculations for Project Area | | | | |
|---|---|---|---|---|
| Drainage Area | Area (Acres) | Percent Imperviousness (%) | Q50 (cfs) (volumetric flow rate measured in cubic feet per second) | V50 (cf) (volume of flow measured in cubic feet) |
| A | 2.74 | 100 | 8.68 | 52,378 |
| B | 1.68 | 73 | 5.25 | 25,509 |
| C | 0.76 | 100 | 2.41 | 14,528 |

[2] The entire length of the Project Site is approximately 1,365 feet.

| | | | | |
|---|---|---|---|---|
| D | 0.28 | 69 | 0.87 | 4,088 |
| **Total** | **5.46** | **90.1** | **17.21** | **96,503** |

| Table 1b- Existing Drainage Stormwater Runoff Calculations for Project With Deck Area | | | | |
|---|---|---|---|---|
| Drainage Area | Area (Acres) | Percent Imperviousness (%) | Q50 (cfs) (volumetric flow rate measured in cubic feet per second) | V50 (cf) (volume of flow measured in cubic feet) |
| A | 2.74 | 100 | 8.68 | 52,378 |
| B | 1.68 | 73 | 5.25 | 25,509 |
| C | 0.76 | 100 | 2.41 | 14,528 |
| D | 0.28 | 69 | 0.87 | 4,088 |
| E | 3.01 | 1 | 9.10 | 14,145 |
| **Total** | **8.47** | **58.4** | **26.31** | **110,648** |

### 2.1.3. OFF-SITE INFRASTRUCTURE - PROJECT VICINITY

Offsite underground storm drain facilities in the Project vicinity (see Figure 2) consist of the following:

- **Mesquit Street:** There is a 15-inch storm main in Mesquit Street between 6th Street and Jesse Street that conveys flow southward to Jesse Street. There are five catch basins located on Mesquit Street, two catch basins are located on the north side and captures the sheet flow from the northern part of Mesquit. There are two catch basins located mid-block that captures the water flowing south from the two catch basins at the north and also a portion of the Jessie and Mesquit intersection. The catch basin at the far south end of Mesquit Street intercept surface flows conveyed southward in Mesquit Street; runoff is discharge from this catch basin via a 12-inch pipe to 7th Street. The estimated full-flow capacity of the 12-inch pipe is 3.56 cfs, as shown on figure 2A.

- **Jesse Street:** There is a 15-inch storm main line in Jesse Street that conveys the flow westward from Mesquit Street towards Santa Fe Avenue. It is estimated that the existing 15-inch pipe in Jessie Street has a full-flow capacity of 4.93 cfs, as shown on figure 2B.

- **7th Street:** There is a 97-inch storm main in 7th Street that conveys flow eastward and discharges into the Los Angeles River. Furthermore, there is a 24-inch lateral on the southeast corner of the project site that is connected to the 97-inch storm drain main. It is estimated that the full-flow capacity of the 24-inch lateral entering the 97-inch storm drain main in 7th street is 31.99 cfs, as shown on figure 2C.

The underground main pipes, laterals and catch basins noted above are owned and maintained by the City of Los Angeles. With the exception of existing Drainage Areas B and E, stormwater runoff from the Project Site is discharged into offsite storm drainage catch basins and underground storm drainage pipes which convey stormwater through various underground pipe networks into the Los Angeles River. Stormwater runoff from existing Drainage Areas B and E sheet flows directly into the Los Angeles River. The Los Angeles River flows generally east and south, ultimately discharging into the Pacific Ocean at the San Pedro Bay.

## 2.2. Surface Water Quality

### 2.2.1. Regional

As stated above, the Project Site lies within the Los Angeles River Watershed Reach 2. Constituents of concern listed for the Los Angeles River Reach 2 under California's Clean Water Act Section 303(d) List include cadmium (sediment), copper (dissolved), lead, selenium, zinc, E. Coli, and trash.[3]

### 2.2.2. Local

In general, urban stormwater runoff occurs following precipitation events, with the volume of runoff flowing into the drainage system depending on the intensity and duration of the rain event. Contaminants that may be found in stormwater from developed areas include sediments, trash, bacteria, metals, nutrients, organics and pesticides. The source of contaminants includes surface areas where precipitation falls, as well as the air through which it falls. Contaminants on surfaces such as roads, maintenance areas, parking lots, and buildings, which are usually contained in dry weather conditions, may be carried by rainfall runoff into drainage systems. The City of Los Angeles typically installs catch basins with screens 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.

### 2.2.3. Project Site

Based on the project survey by CRC Enterprises shown in Figure 1 (dated September 8, 2015), site observations, and the fact that the existing site was developed prior to the enforcement of storm water quality BMP design, implementation and maintenance, it appears the Project Site currently does not implement Best Management Practices (BMPs) and has no means of treatment for stormwater runoff.

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3 https://iaspub.epa.gov/waters10/attains_waterbody.control?p_au_id=CAR4051501019990202085021&p_cycle=2012&p_state=CA&p_report_type=; accessed February 1, 2018.

## 2.3. Groundwater Hydrology

### 2.3.1. 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 Los Angeles Coastal Plain Groundwater Basin (Basin). The Basin comprises the Hollywood, Santa Monica, Central, and West Coast Subbasins. Groundwater flow in the Basin is generally south-southwesterly and may be restricted by natural geological features. Replenishment of groundwater basins occurs mainly by percolation of precipitation throughout the region via permeable surfaces, spreading grounds, and groundwater migration from adjacent basins, as well as injection wells designed to pump freshwater along specific seawater barriers to prevent the intrusion of salt water.

### 2.3.2. Local

Within the Basin, the Project Site specifically overlies the northeast portion of the Central Subbasin (subbasin), which occupies a large portion of the southeastern part of the Coastal Plain of Los Angeles Groundwater Basin. This subbasin is commonly referred to as the "Central Basin". The Central Basin is bounded on the north by a surface divide called the La Brea high, and on the northeast and east by emergent, less permeable Tertiary rocks of the Elysian, Repetto, Merced and Puente Hills. The southeast boundary between Central Basin and Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage province boundary. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift.[4]

Groundwater enters the Central Basin through surface and subsurface flow and by direct percolation of precipitation, stream flow, and applied water; and replenishes the aquifers dominantly in the forebay areas (an area with a free groundwater surface, meaning that the uppermost aquifer is unconfined and percolating surface waters can reach the aquifer rapidly) where permeable sediments are exposed at ground surface (DWR 1961). Natural replenishment of the subbasin's groundwater supply is largely from surface inflow through Whittier Narrows (and some underflow) from the San Gabriel Valley. Imported water purchased from Metropolitan Water District and recycled water from Whittier and San Jose Treatment Plants are used for artificial recharge in the Montebello Forebay at the Rio Hondo and San Gabriel River spreading grounds (DWR 1999).

The Central Basin Watermaster notes that precipitation over the Central Basin has relatively minimal direct influence on the replenishment of the groundwater in the Central Basin. This is a result of the low soil permeability that characterizes the primary water-producing aquifers throughout much of the Central Basin and largely impermeable surfaces (i.e., pavement and buildings) covering most of the forebay areas. Natural replenishment of the groundwater in the Central Basin occurs largely from surface flow that is captured and infiltrated, and underflow through Whittier Narrows from the San Gabriel Valley. Intentional replenishment of groundwater in the Central Basin is accomplished by

4 http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/4-11.04.pdf

capturing and spreading water at infiltration basins. The sources of this replenishment water include local storm runoff, local dryweather urban runoff, imported water purchased from the Metropolitan Water District of Southern California, and recycled water purchased from Los Angeles County Sanitation Districts. All sources of water available for the Central Basin would total 85,746 acre-feet during the 2017-2018 water year.[5]

#### 2.3.3. Project Site

The existing Project Site is partially developed with existing Cold Storage facilities, which are comprised of one- to four- story buildings with a total area of approximately 205,393 square feet, as well as loading bays and surface parking. To the north of the existing Cold Storage facilities is a dirt lot area, and to the east of the Project Site is a railway property which the Deck would extend over if it is constructed. Due to the partly pervious condition of the Project Site, there is recharge potential under existing conditions.

As described in the *Geotechnical Engineering Evaluation Report* prepared for the Project Site by Twining Consulting (April 23, 2018), groundwater is assumed to be approximately 57 to 61 feet bgs although historic data shows it at much lower elevations.

### 2.4. Groundwater Quality

#### 2.4.1. Regional

As stated above, the City of Los Angeles overlies the Los Angeles Coastal Plain Groundwater Basin, which falls under the jurisdiction of the Los Angeles Regional Water Quality Control Board (LARWQCB). According to LARWQCB's Basin Plan, objectives applying to all ground waters of the region include bacteria, chemical constituents and radioactivity, mineral quality, nitrogen (nitrate, nitrite), and taste and odor.[6]

#### 2.4.2. Local

As stated above, the Project Site specifically overlies the Central Subbasin. Based upon LARWQCB's Basin Plan, constituents of concern listed for the Central Subbasin include boron, chloride, sulfate, Total Dissolved Solids (TDS), and nitrate.[7]

#### 2.4.3. Project Site

The northern area of the Project Site and the railway property to the east of the Project Site are primarily pervious and therefore do contribute to groundwater recharge. Due to the partial perviousness of the Project Site, it is possible for surface water-borne contaminants

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5 Central Basin Watermaster, Watermaster Service in The Central Basin - Los Angeles County, July 1, 2017 - June 30, 2018, Table 15.

6 Los Angeles Regional Water Quality Control Board, Basin Plan, March 2013, http://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/electronics_documents/Final%20Chapter%203%20Text.pdf accessed February 1, 2018.

7 Ibid.

to percolate into groundwater and affect groundwater quality. However, compliance with all existing hazardous waste regulations would reduce this potential. Nonetheless, groundwater quality may be impacted by past and existing activities at the Project Site.

The below discussion is based upon a review of relevant previous investigations and on-site explorations conducted as part of the Phase I Environmental Site Assessment (ESA) dated September 6, 2016 and Phase II ESA dated September 6, 2018 for the Project Site by Rincon Consultants Inc. Other types of risk such as underground storage tanks have a greater potential to impact groundwater. The subject property is not listed on the California Facility Inventory Database Underground Storage Tank (CA FID UST) database. While it appears no underground storage tanks (USTs) are currently operated by the property owner, two 150-gallon petroleum USTs are historically documented as being in the current location of the 690 Mesquit Street building. No documentation has been identified that confirms the removal of the USTs and associated piping.[8] Further investigation of USTs and associated piping was performed and Total Petroleum Hydrocarbons as diesel was discovered on-site in the vicinity of the former onsite USTs at concentrations above environmental screening levels (ESLs) and maximum soil screening levels (SSLs). If the USTs are uncovered during excavation the former USTs would be removed in accordance with California Health and Safety Code, Division 20, Chapter 6.7, and California Code of Regulations Title 23, Division 3, Chapter 16 and Chapter 18.

# 3. PROPOSED PROJECT

## 3.1. CONSTRUCTION

### 3.1.1. SURFACE WATER HYDROLOGY

Construction activities for the Project would include demolition of existing one- and two-story buildings and hardscape, excavating down approximately an average of 61 to 68 feet bgs and a maximum of 71-75 feet bgs for subterranean parking, building the mixed-used development buildings, and constructing hardscape and landscape around the buildings. It is anticipated that up to approximately 531,319cubic yards of soil would be graded, most of which would be exported to construct the Project. These activities have the 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.

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

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8 Phase I Environmental Site Assessment Report, by Rincon Consultants, Inc., dated September 2016.

runoff during construction. The NPDES and SWPPP measures are designed to (and would) contain and treat, as necessary, stormwater or construction watering for dust reduction on the Project Site so runoff does not impact off-site drainage facilities or receiving waters. Construction activities would be temporary, and flow directions and runoff volumes during construction would 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, or flooding on- or off-site. Similarly, adherence to standard compliance measurements in construction activities would avoid flooding, substantially increasing or decreasing the amount of surface water flow from the Project Site into a water body, or a permanent, adverse change to the movement of surface water.

### 3.1.2. 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, the Project 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 would not necessarily be limited to: erosion control, sediment control, non-stormwater management, and materials management BMPs. Refer to Exhibit 1 for typical SWPPP BMPs implemented during the construction of development projects.

As discussed below, the Project may require dewatering during construction. Dewatering operations are practices that discharge non-stormwater, such as groundwater, that must be removed from a work location and discharged into the storm drain system to proceed with construction. 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. The temporary system would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations. If dewatering is required, the treatment and disposal of the dewatered water would occur in accordance with the requirements of LARWQCB’s Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties.

With the implementation of site-specific BMPs included as part of the required Erosion Plan, 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 implementation of 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 cause: (1) pollution which would alter the quality of the water of the State (i.e. Los Angeles River) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the water of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes. Furthermore, construction of the Project would not result in discharges that would cause regulatory standards to be violated in Los Angeles River.

### 3.1.3. GROUNDWATER HYDROLOGY

Given the excavation depths and anticipated groundwater depth, temporary dewatering operations may be required. If groundwater is encountered during construction, temporary pumps and filtration would be utilized in compliance with all applicable regulations and requirements, including all relevant NPDES requirements related to construction and discharges from dewatering operations. The temporary dewatering would be active during excavation and during the construction of the basement slabs and basement walls. The walls and slab will be designed to withstand hydrostatic and buoyant forces and the groundwater is expected to return to measured levels. No operational dewatering is expected or anticipated. Therefore, the Project would not substantially deplete groundwater supplies in a manner that would result in a net deficit in aquifer volume or lowering of the local groundwater table.

### 3.1.4. GROUNDWATER QUALITY

Per the Phase I/II ESA, contaminated soils are anticipated at the Project Site. Per the recommendations of the Phase II ESA, a soil management plan should be prepared to address issues associated with the contaminated soils encountered during site excavation/grading activities.[9] The contaminated soils would be captured within the proposed 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 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.

[9] Phase 2 Environmental Site Assessment Report, by Rincon Consultants, Inc., dated September 6, 2018.

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.

There is one groundwater well within one mile southeast of the Project Site[10], and a number of groundwater monitoring wells north of 6th Street at 570 S Santa Fe Avenue[12]; Furthermore, Two groundwater wells identified as located on the Project Site on the 1890 and 1894 Sanborn maps are no longer shown on the more recent Sanborn maps and there is currently an existing building located where the wells were identified on the maps. If unearthed during construction the wells should be properly demolished per local and state regulations. A groundwater monitoring well has also been identified in the public right of way adjacent to the north end of the Project Site[13] within an area currently under construction as a part of the 6th Street Bridge improvements project. It appears that the groundwater monitoring well has been demolished by the City.

## 3.2. Operation

### 3.2.1. Surface Water Hydrology

The Project will increase the percentage of impervious area compared to existing conditions on the Project Site. Specifically, the Project Site, including the vacated portion of Mesquit Street absorbed into the Project Site, is approximately 5.46 acres and is currently developed with one- and two-story buildings, loading bays, surface parking, and an unimproved dirt lot. The approximate 3.01-acre Deck over the adjacent railway property located east of the Project Site would increase the Project Site to approximately 8.47 acres. The existing Project Site with the street vacation and Deck has approximately 58.4% impervious surface coverage. In the existing condition, storm water discharges from the Project Site without filtration.

The post-project condition with the street vacation and Deck could be up to approximately 96% impervious. The analysis is conservative and assumes that the Deck would be 100% impervious.

Under the proposed conditions illustrated in Figure 3, the Project Site would consist of nine drainage areas that would drain via building roof drains, surface flow, and subterranean drainage to the proposed BMPs.

[10] Los Angeles County Department of Public Works, Groundwater Wells Data, http://dpw.lacounty.gov/general/wells/ accessed January 31, 2018.

[12] Twining Consulting Inc. *Geotechnical Engineering Evaluation Report*, dated April 12, 2018.

[13] Phase I Environmental Site Assessment Report, by Rincon Consultants, Inc., dated September 6, 2016.

- Proposed Drainage Areas A, B, C, D, and E represent Buildings 5, 4, 3, 2, and 1, respectively.

- Proposed Drainage Area F represents the Northern Landscaped Area at the northern end of the Project Site.

- Proposed Drainage Area G represents the eastern half right-of-way portion of Mesquit Street north of the existing LADWP electrical substation which would be vacated with approval of the Project and absorbed into the Project Site.

- Proposed Drainage Area H represents the eastern half right-of-way portion of Mesquit Street south of the existing LADWP electricity substation, which would also be vacated with approval of the Project and absorbed into the Project Site.

- Proposed Drainage Area I represents the portion of the Deck over the Railway Properties that may be constructed if agreements can be obtained with Railway Properties' owners.

Stormwater runoff from all drainage areas will be conveyed to the LID Project BMPs. Figure 5A-I shows all the input parameters used for analyzing the proposed Project Site.

Table 2a shows the proposed volumetric flow rates and volumes generated by a 50-year storm event for the project. Table 2b shows the proposed volumetric flow rates and volumes generated by a 50-year storm event for the project with the Deck.

| Table 2a - Proposed Onsite Drainage Stormwater Runoff Calculations for Project Area | | | | |
|---|---|---|---|---|
| Drainage Area | Area (Acres) | Percent Imperviousness (%) | Q50 (cfs) (volumetric flow rate measured in cubic feet per second) | V50 (cf) (volume of flow measured in cubic feet) |
| A | 1.05 | 100 | 3.33 | 20,072 |
| B | 0.87 | 100 | 2.76 | 16,631 |
| C | 1.01 | 100 | 3.20 | 19,307 |
| D | 0.77 | 100 | 2.44 | 14,719 |
| E | 0.61 | 100 | 1.93 | 11,661 |
| F | 0.65 | 50 | 2.01 | 7,693 |
| G | 0.08 | 100 | 0.25 | 1,529 |
| H | 0.42 | 100 | 1.33 | 8,029 |
| **Total** | **5.46** | **94.0** | **17.25** | **99,641** |

| Table 2b - Proposed Onsite Drainage Stormwater Runoff Calculations for Project with Deck Area | | | | |
|---|---|---|---|---|
| Drainage Area | Area (Acres) | Percent Imperviousness (%) | Q50 (cfs) (volumetric flow rate measured in cubic feet per second) | V50 (cf) (volume of flow measured in cubic feet) |
| A | 1.05 | 100 | 3.33 | 20,072 |
| B | 0.87 | 100 | 2.76 | 16,631 |
| C | 1.01 | 100 | 3.20 | 19,307 |
| D | 0.77 | 100 | 2.44 | 14,719 |
| E | 0.61 | 100 | 1.93 | 11,661 |
| F | 0.65 | 50 | 2.01 | 7,693 |
| G | 0.08 | 100 | 0.25 | 1,529 |
| H | 0.42 | 100 | 1.33 | 8,029 |
| I | 3.01 | 100 | 9.54 | 57,539 |
| **Total** | **8.47** | **96.2** | **26.79** | **157,180** |

Compliance with the LID requirements for the Project Site and the Project site with Deck option would ensure stormwater treatment with post-construction BMPs that are required to control pollutants associated with storm events up to the 85th percentile storm event, per the City's Stormwater Program. In order to meet the LID requirements, it is estimated that up to 16,424 cubic feet of stormwater for the base project and up to 25,969 cubic feet of stormwater for the Project Site including the deck will need to be mitigated within the Project Site (see Figure 6). To manage this LID design volume the Applicant would likely install infiltration systems which may be supplemented by underground storage pipes. The pipes would temporarily store the captured stormwater until the stored volume is entirely infiltrated through the infiltration systems. Typical infiltration systems are illustrated in Exhibit 2.

Given the anticipated depth to groundwater, infiltration systems are currently conceptualized to infiltrate down to 47 feet bgs to meet the City's groundwater setback requirements. The vacated portions of Mesquit Street absorbed into the Project Site (i.e. in the at-grade area highlighted in pink and orange on Figure 3) and/or the Northern Landscaped Area (i.e. in the at-grade area highlighted in green on Figure 3) could accommodate the anticipated stormwater volume.

Table 3a summarizes the existing and post-Project 50-year design storm event peak flow rates from the Project Site.

| Table 3a – Pre- and Post-Project 50-year frequency peak flow rates for Project Area | | | | |
|---|---|---|---|---|
| **Drainage Area** | **Project Site Area (Acres)** | **Pre-Project Q50 (cfs)** (volumetric flow rate measured in cubic feet per second) | **Post-Project Q50 (cfs)** (volumetric flow rate measured in cubic feet per second) | **Increase from Existing to Proposed Condition (%)** |
| Entire Site | 5.46 | 17.21 | 17.25 | 0.23% |

Table 3b summarizes the existing and post-Project 50-year design storm event peak flow rates from the Project with Deck Site.

| Table 3b – Pre- and Post-Project 50-year frequency peak flow rates for Project with Deck Area | | | | |
|---|---|---|---|---|
| **Drainage Area** | **Project Site Area (Acres)** | **Pre-Project Q50 (cfs)** (volumetric flow rate measured in cubic feet per second) | **Post-Project Q50 (cfs)** (volumetric flow rate measured in cubic feet per second) | **Increase from Existing to Proposed Condition (%)** |
| Entire Site | 8.47 | 26.31 | 26.79 | 1.8% |

Although the Project would increase the 50-year peak flow rate from the entire Project Site with and without the Deck Area, the Project would improve current conditions by capturing and treating the 85$^{th}$ percentile storm, and thus improving the quality of the stormwater discharged to the public infrastructure.

In addition, as described above, as part of the SUSMP for the Project to manage post-construction stormwater runoff, the Project would include the installation of building roof drain downspouts, catch basins, and planter drains throughout the Project Site to collect roof and site runoff and direct stormwater away from buildings through a series of underground storm drain pipes. This on-site stormwater conveyance system would serve to prevent on-site flooding and nuisance water on the Project Site.

As noted above, the Project with the deck would increase (by approximately 1.8%) the 50-year peak flow rate from the Project Site. Site runoff which drains to Mesquit Street under existing conditions will continue to do so in the post-Project condition, whereas site runoff which drains to the Railway Properties under existing conditions will be rerouted to discharge to either Mesquit Street or 7th Street.

Due to the implementation of the LID BMPs and on-site stormwater volume mitigation, the 50-year peak flow volume will decrease for the base Project Site area (excluding the Railway Properties/proposed deck area). The 50-year peak flow volume generated by the entire Project Site including the Deck would increase and potentially require mitigation measures based on the City of Los Angeles Bureau of Engineering (BOE) review of the existing infrastructure capacity at the time the proposed storm drain system is designed and submitted to the City for review and permitting. In the situation of a rainfall exceeding the 85th percentile storm, the LID system would overflow either to the curb face, or into existing and/or proposed catch basins or laterals located along Mesquit Street or 7th Street. These would connect to the underground storm mains running in Jesse Street and 7th street and ultimately discharge to the Los Angeles River.

Table 4a summarizes the existing and post-Project 50-year design storm event 24-hour volumetric flows from the Project Site.

| Table 4a– Pre- and Post-Project 50-year 24-hour volume flow for Project Area | | | | | |
|---|---|---|---|---|---|
| **Drainage Area** | **Project Site Area (Acres)** | **Pre-Project V50 (cf)** (volumetric flow measured in cubic feet) | **Post-Project V50 (cf)** (volumetric flow measured in cubic feet) | **Estimated Low Impact Development Treatment Volume** (volumetric flow measured in cubic feet) | **Decrease from Existing to Proposed Condition (%)** |
| Entire Site | 5.46 | 96,503 | 99,641 | 16,424 | 13.8% |

The Project would decrease the 50-year flow volume from the entire Project Site, and the Project would improve current conditions by capturing and treating the 85th percentile storm, thus improving the quality of the stormwater discharged to the public infrastructure.

Consequently, the base Project (without Deck area) would not cause flooding during the 50-year developed storm event, would not create runoff which would exceed the capacity of existing or planned drainage systems, would not 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.

Table 4b summarizes the existing and post-Project 50-year design storm event 24-hour volumetric flows from the Project with Deck Site.

| Table 4b – Pre- and Post-Project 50-year 24-hour volume flow for Project with Deck Area | | | | | |
|---|---|---|---|---|---|
| **Drainage Area** | **Project Site Area (Acres)** | **Pre-Project V50 (cf)** (volumetric flow measured in cubic feet) | **Post-Project V50 (cf)** (volumetric flow measured in cubic feet) | **Estimated Low Impact Development Treatment Volume** (volumetric flow measured in cubic feet) | **Increase from Existing to Proposed Condition (%)** |
| Entire Site | 8.47 | 110,648 | 157,180 | 25,969 | 18.6% |

It is estimated that the project including the deck will increase the 50-year 24-hour flow volume discharging from the site by up to 18.6%. Therefore, as the Project with the Deck Concept could substantially alter the existing drainage pattern of the site area in a manner which could substantially increase the rate or amount of surface runoff and result in flooding on- or off-site, impacts would be potentially significant, and mitigation would be required.

As discussed above, during the design and plan check process, the Project design team will coordinate with the City of Los Angeles Bureau of Engineering (BOE) to assess the potential for the Project with the Deck Concept to cause an exceedance of the capacity of existing or planned tributary municipal stormwater drainage systems. In the event this assessment identifies potential for exceedance of the capacity of the municipal stormwater drainage system, the Project shall address the deficiency through either an expanded on-site LID system, or through reconstruction and upgrades to the existing catch basins in Mesquit Street, the 15-inch storm main in Jesse Street, and the 24-inch storm lateral on 7$^{th}$ Street. The assessment of stormwater drainage systems and the design and construction of any upgrades to the Project LID system and/or off-site municipal stormwater drainage systems shall be subject to review and approval by BOE.

The performance standard for this mitigation measure shall be an assessment of the stormwater drainage systems serving the Project Site, and provision of an expanded on-site LID system or upgrades to off-site infrastructure such that the Project with the Deck

Concept would accommodate the 50 year 24 hour flow volume discharged from the Project Site and railroad properties and would not result in an exceedance of the capacity of existing or planned stormwater drainage systems, if determined necessary by BOE.

Although the Project would increase the 50-year flow volume from the entire Project with Deck Site, the Project would improve current conditions by capturing and treating the 85th percentile storm, and thus improving the quality of the stormwater discharged to the public infrastructure.

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, Exhibit G: Inundation & Tsunami Hazard Areas (Refer to Figure 10), the Project Site is located in a potential dam inundation area. Dam safety regulations are the primary means of reducing damage or injury due to inundation occurring from dam failure. The California Division of Safety of Dams regulates the siting, design, construction, and periodic review of all dams in the State. In addition, the Los Angeles Department of Water and Power (LADWP) operates the dams in the Project Site area and mitigates the potential for over flow and seiche hazard through control of water levels and dam wall height. These measures include seismic retrofits and other related dam improvements completed under the requirements of the 1972 State Dam Safety Act. The City's Local Hazard Mitigation Plan,[14] which was adopted in July 2011, provides a list of existing programs, proposed activities and specific projects that may assist the City of Los Angeles in reducing risk and preventing loss of life and property damage from natural and human-caused hazards, including dam failure. The Hazard Mitigation Plan evaluation of dam failure vulnerability classifies dam failure as a moderate risk rating. Therefore, considering the above information and risk reduction projects, the risk of flooding from inundation by a seiche or dam failure is considered low.

Additionally, the Project Site is not located within a Special Flood Hazard Area (100-year floodplain) or Moderate Flood Hazard Area (500-year floodplain) identified by the Federal Emergency Management Agency (FEMA) and published in the Flood Insurance Rate Maps (FIRM).[15] The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 500-year floodplain are labeled Zone C or Zone X (unshaded). As shown on Figure 9, the Project Site is located within Zone X (unshaded) and is therefore located outside of the 100- and 500-year floodplain.[16]

### 3.2.2. SURFACE WATER QUALITY

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[14] City of Los Angeles Emergency Management Department, *Local Hazard Mitigation Plan,* dated July 1, 2011.

[15] FIRMs depict the 100-year floodplain as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. FIRMs depict the 500-year floodplain as Zone B or Zone X (shaded).

[16] Based on FIRM Number 06037C1636F, effective on 09/26/2008.

As previously described, the Project would be required to implement SUSMP and LID requirements throughout the operational life of the Project. As part of these requirements, the Project would prepare a SUSMP which would outline the stormwater treatment measures or post-construction BMPs required to control pollutants of concern. In addition, consistent with LID requirements to reduce the quantity and improve the quality of rainfall runoff that leaves the Project Site, the Project would include the installation of an infiltration system 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 indicated that infiltration BMPs seems feasible for the Project Site. Based on the explorations of the Project Site, the Geotechnical Engineer estimated that a design percolation rate of 5 inches per hour can be assumed at the Project site.[17] As is typical of most urban developments, stormwater runoff from the Project Site has the potential to introduce pollutants into the stormwater system. Anticipated and potential pollutants generated by the Project 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 LID BMPs would be included as part of the SUSMP 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 SUSMP and LID Manual.

As described above, the Project Site currently does not have structural BMPs in place 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 the Project Site. In

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17 Twining Consulting Inc. *Percolation Testing Report*, dated February 9, 2018.

implementation of BMPs, which would utilize the natural adsorption[18] 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 of both the existing and proposed Project site, these effects are expected to be less significant than the proposed structural BMPs described above in terms of incremental improvement of existing conditions.

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., Los Angeles 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; 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 San Pedro Bay and Long Beach Harbor.

### 3.2.3. 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 implementation of the Project would include the addition of impervious surfaces throughout the Project Site boundary. However, as the Project is located in a highly urbanized area, any reduction in groundwater recharge due to the overall net change in impervious area would be minimal in the context of the regional groundwater basin. The Project would include the installation of SUSMP and 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 in Section 3.1.4, there are a number of water and groundwater monitoring wells in the vicinity. Two groundwater wells identified as located on the Project Site on the 1890 and 1894 Sanborn maps are no longer shown on the more recent Sanborn maps and there is currently an existing building located where the wells were identified on the maps. If unearthed during construction the wells should be properly demolished per local and state regulations. A groundwater monitoring well has also been identified in the public right of way adjacent to the north end of the Project Site within an area currently

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[18] Adsorption is the attachment of pollutants in water to soil particles, resulting in retention of pollutants.

under construction as a part of the 6th Street Bridge improvements project. It appears that the groundwater monitoring well has been demolished by the City.

### 3.2.4. 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 storage tanks are currently operated. In addition to the underground LID infiltration BMP systems described above, multiple underground stormwater storage pipes/tanks may be operated by the Project. All tanks will be installed and maintained in compliance of all existing regulations.

In addition, while the development of expanded facilities would increase the use of existing on-site hazardous materials, 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 85th percentile storm event and the first 0.75-inch of rainfall for any storm event, which would allow for treatment of runoff generated on-site prior to contact with the groundwater below.

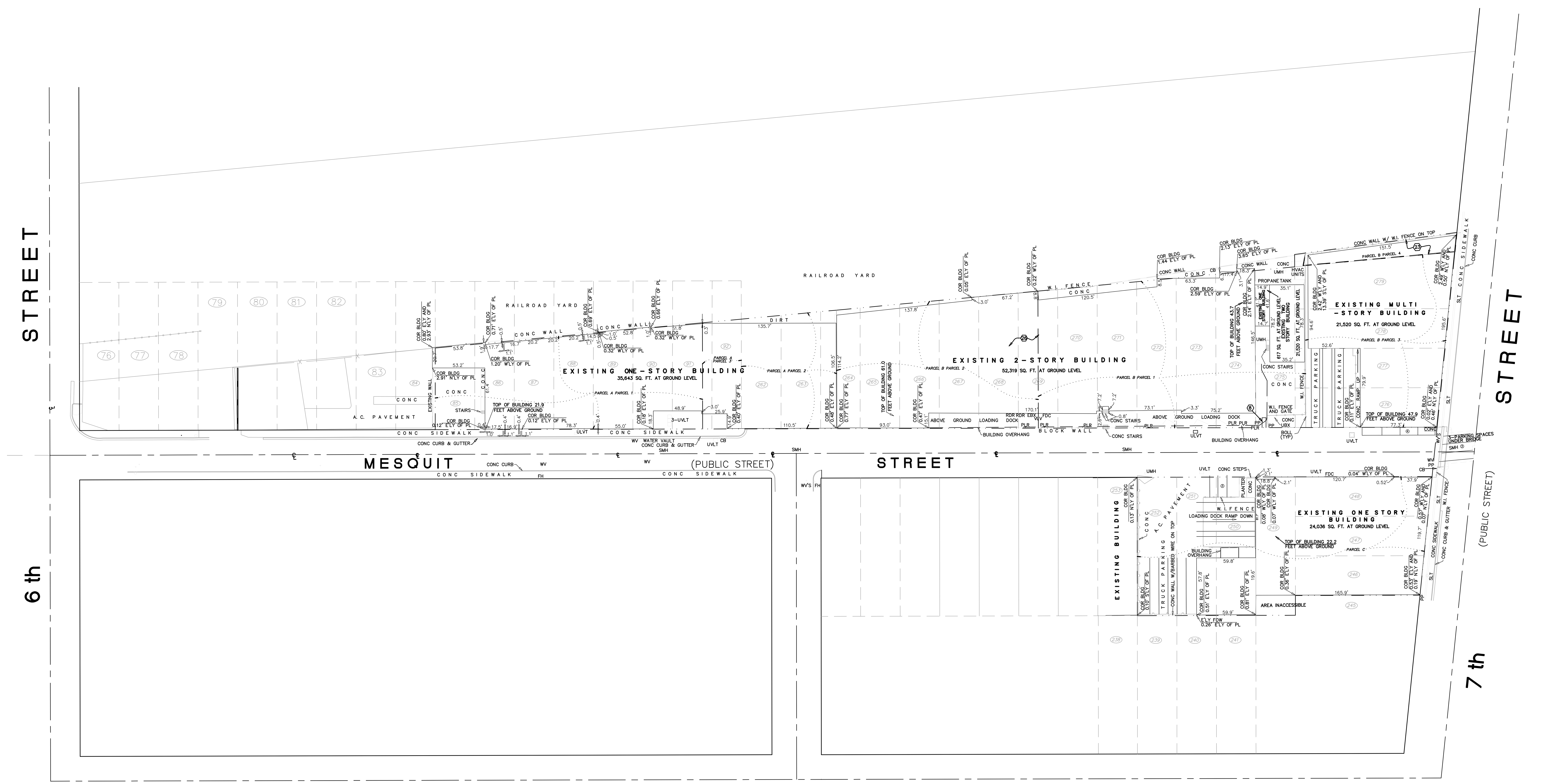
## 3.3. CONCLUSION

In conclusion, the Project will improve the site's hydrologic function. The current site design and existing conditions allow the Applicant multiple options to install infiltration systems that would comply with the City's LID requirements. Whereas stormwater from the Project Site currently either sheet flows directly into the Los Angeles River or sheet flows into an underground storm drain network that ultimately discharges to the Los Angeles River, implementation of the Project would capture and treat stormwater on-site, improving water quality in receiving water bodies and increasing groundwater recharge.

# APPENDICES

# FIGURE 1 - PROJECT SURVEY

SCALE 1' = 50'




LICENSED LAND SURVEYOR
RONALD N. KOESTER
NO. 5930
STATE OF CALIFORNIA

PLANS PREPARED UNDER THE DIRECTION OF

08 SEPT. 2015

RON KOESTER LS 5930 EXP. 12/31/2016 DATE

REVISIONS

DATE

ALTA/ACSM LAND TITLE SURVEY

CRC 3061

SHEET 4 OF 4 SHEETS

PREPARED FOR
RANCHO COLD STORAGE, INC.
670 MESQUIT STREET
LOS ANGELES, CA. 90021
ATTN: Mr. Frank Gallo, VP


CRC Enterprises
27600 Bouquet Canyon Road Suite 200 Santa Clarita Ca. 91350
Telephone (661) 297-2336 FAX (661) 297-2331

# FIGURE 2 - EXISTING SITE DRAINAGE

LEGEND

SURFACE DRAINAGE

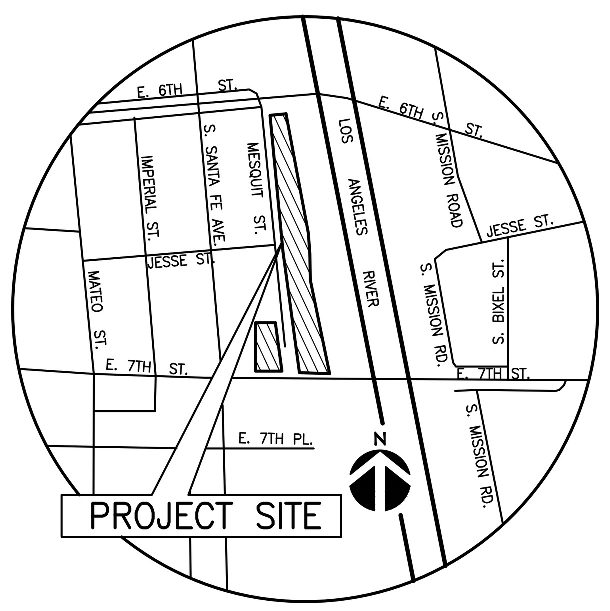
BENCHMARK INFORMATION

ELEVATIONS SHOWN HEREON ARE RELATIVE TO THE FOLLOWING BENCHMARK:

CITY OF LOS ANGELES BENCH MARK # 12-04070

CUT SPIKE 7 FEET SOUTH OF SOUTHERLY CURB LINE 7TH STREET; 0.8 FEET WEST OF WESTERLY END OF HANDRAIL TO BRIDGE 25 FEET EAST OF SANTA FE AVE.

ELEVATION= 247.26' NGVD 1929 (1985 ADJ)




VICINITY MAP
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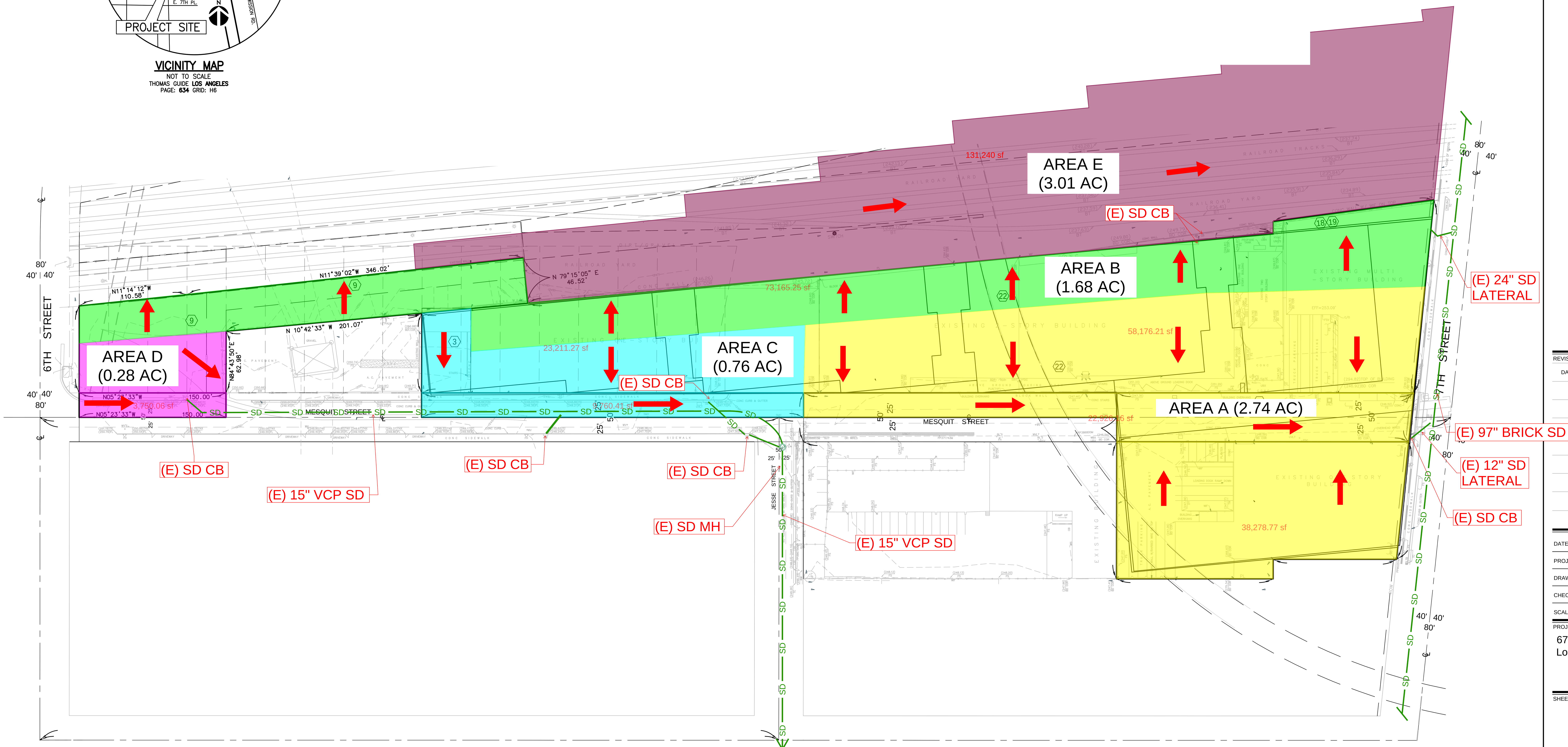



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|---|---|---|
| DATE | △ | ISSUED FOR |

| | |
|---|---|
| DATE | 2/22/2017 |
| PROJECT NUMBER | 1600389 |
| DRAWN BY | DA |
| CHECKED BY | CJ |
| SCALE | 1" = 50' |

PROJECT DESCRIPTION
670 Mesquit Street
Los Angeles, CA 90021

SHEET NUMBER
FIGURE 1

FIGURE 2A

# *Mesquit Street - 12 Inch SD Lateral*

## Project Description

| | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Full Flow Capacity |

## Input Data

| | | |
|---|---|---|
| Roughness Coefficient | 0.013 | |
| Channel Slope | 1.00000 | % |
| Normal Depth | 1.00 | ft |
| Diameter | 12.00 | in |
| Discharge | 3.56 | ft³/s |

## Results

| | | |
|---|---|---|
| Discharge | 3.56 | ft³/s |
| Normal Depth | 1.00 | ft |
| Flow Area | 0.79 | ft² |
| Wetted Perimeter | 3.14 | ft |
| Hydraulic Radius | 0.25 | ft |
| Top Width | 0.00 | ft |
| Critical Depth | 0.81 | ft |
| Percent Full | 100.0 | % |
| Critical Slope | 0.01032 | ft/ft |
| Velocity | 4.54 | ft/s |
| Velocity Head | 0.32 | ft |
| Specific Energy | 1.32 | ft |
| Froude Number | 0.00 | |
| Maximum Discharge | 3.83 | ft³/s |
| Discharge Full | 3.56 | ft³/s |
| Slope Full | 0.01000 | ft/ft |
| Flow Type | SubCritical | |

## GVF Input Data

| | | |
|---|---|---|
| Downstream Depth | 0.00 | ft |
| Length | 0.00 | ft |
| Number Of Steps | 0 | |

## GVF Output Data

| | | |
|---|---|---|
| Upstream Depth | 0.00 | ft |
| Profile Description | | |
| Profile Headloss | 0.00 | ft |
| Average End Depth Over Rise | 0.00 | % |

FIGURE 2A

# *Mesquit Street - 12 Inch SD Lateral*

## GVF Output Data

| | | |
|---|---|---|
| Normal Depth Over Rise | 100.00 | % |
| Downstream Velocity | Infinity | ft/s |
| Upstream Velocity | Infinity | ft/s |
| Normal Depth | 1.00 | ft |
| Critical Depth | 0.81 | ft |
| Channel Slope | 1.00000 | % |
| Critical Slope | 0.01032 | ft/ft |

FIGURE 2B

# *Jessie Street - 15 inch SD Pipe*

## Project Description

| | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Full Flow Capacity |

## Input Data

| | | |
|---|---|---|
| Roughness Coefficient | 0.013 | |
| Channel Slope | 0.58300 | % |
| Normal Depth | 1.25 | ft |
| Diameter | 15.00 | in |
| Discharge | 4.93 | ft³/s |

## Results

| | | |
|---|---|---|
| Discharge | 4.93 | ft³/s |
| Normal Depth | 1.25 | ft |
| Flow Area | 1.23 | ft² |
| Wetted Perimeter | 3.93 | ft |
| Hydraulic Radius | 0.31 | ft |
| Top Width | 0.00 | ft |
| Critical Depth | 0.90 | ft |
| Percent Full | 100.0 | % |
| Critical Slope | 0.00772 | ft/ft |
| Velocity | 4.02 | ft/s |
| Velocity Head | 0.25 | ft |
| Specific Energy | 1.50 | ft |
| Froude Number | 0.00 | |
| Maximum Discharge | 5.31 | ft³/s |
| Discharge Full | 4.93 | ft³/s |
| Slope Full | 0.00583 | ft/ft |
| Flow Type | SubCritical | |

## GVF Input Data

| | | |
|---|---|---|
| Downstream Depth | 0.00 | ft |
| Length | 0.00 | ft |
| Number Of Steps | 0 | |

## GVF Output Data

| | | |
|---|---|---|
| Upstream Depth | 0.00 | ft |
| Profile Description | | |
| Profile Headloss | 0.00 | ft |
| Average End Depth Over Rise | 0.00 | % |

FIGURE 2B

# *Jessie Street - 15 inch SD Pipe*

## GVF Output Data

| | | |
|---|---|---|
| Normal Depth Over Rise | 100.00 | % |
| Downstream Velocity | Infinity | ft/s |
| Upstream Velocity | Infinity | ft/s |
| Normal Depth | 1.25 | ft |
| Critical Depth | 0.90 | ft |
| Channel Slope | 0.58300 | % |
| Critical Slope | 0.00772 | ft/ft |

FIGURE 2C

# *7th Street - 24 Inch SD Lateral*

## Project Description

| | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Full Flow Capacity |

## Input Data

| | | |
|---|---|---|
| Roughness Coefficient | 0.013 | |
| Channel Slope | 2.00000 | % |
| Normal Depth | 2.00 | ft |
| Diameter | 24.00 | in |
| Discharge | 31.99 | ft³/s |

## Results

| | | |
|---|---|---|
| Discharge | 31.99 | ft³/s |
| Normal Depth | 2.00 | ft |
| Flow Area | 3.14 | ft² |
| Wetted Perimeter | 6.28 | ft |
| Hydraulic Radius | 0.50 | ft |
| Top Width | 0.00 | ft |
| Critical Depth | 1.89 | ft |
| Percent Full | 100.0 | % |
| Critical Slope | 0.01730 | ft/ft |
| Velocity | 10.18 | ft/s |
| Velocity Head | 1.61 | ft |
| Specific Energy | 3.61 | ft |
| Froude Number | 0.00 | |
| Maximum Discharge | 34.41 | ft³/s |
| Discharge Full | 31.99 | ft³/s |
| Slope Full | 0.02000 | ft/ft |
| Flow Type | SubCritical | |

## GVF Input Data

| | | |
|---|---|---|
| Downstream Depth | 0.00 | ft |
| Length | 0.00 | ft |
| Number Of Steps | 0 | |

## GVF Output Data

| | | |
|---|---|---|
| Upstream Depth | 0.00 | ft |
| Profile Description | | |
| Profile Headloss | 0.00 | ft |
| Average End Depth Over Rise | 0.00 | % |

FIGURE 2C

# *7th Street - 24 Inch SD Lateral*

## GVF Output Data

| | | |
|---|---|---|
| Normal Depth Over Rise | 100.00 | % |
| Downstream Velocity | Infinity | ft/s |
| Upstream Velocity | Infinity | ft/s |
| Normal Depth | 2.00 | ft |
| Critical Depth | 1.89 | ft |
| Channel Slope | 2.00000 | % |
| Critical Slope | 0.01730 | ft/ft |

# FIGURE 3 - PROPOSED SITE DRAINAGE

LEGEND

SURFACE DRAINAGE

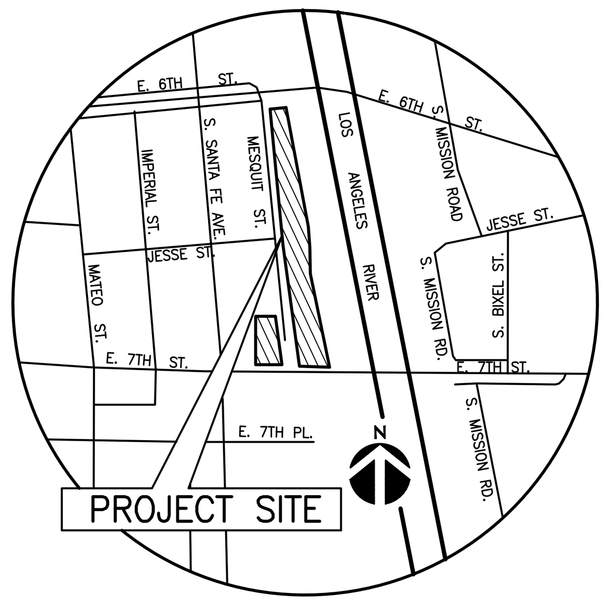
BENCHMARK INFORMATION

ELEVATIONS SHOWN HEREON ARE RELATIVE TO THE FOLLOWING BENCHMARK:

CITY OF LOS ANGELES BENCH MARK # 12-04070

CUT SPIKE 7 FEET SOUTH OF SOUTHERLY CURB LINE 7TH STREET; 0.8 FEET WEST OF WESTERLY END OF HANDRAIL TO BRIDGE 25 FEET EAST OF SANTA FE AVE.

ELEVATION= 247.26' NGVD 1929 (1985 ADJ)




VICINITY MAP

NOT TO SCALE

THOMAS GUIDE LOS ANGELES

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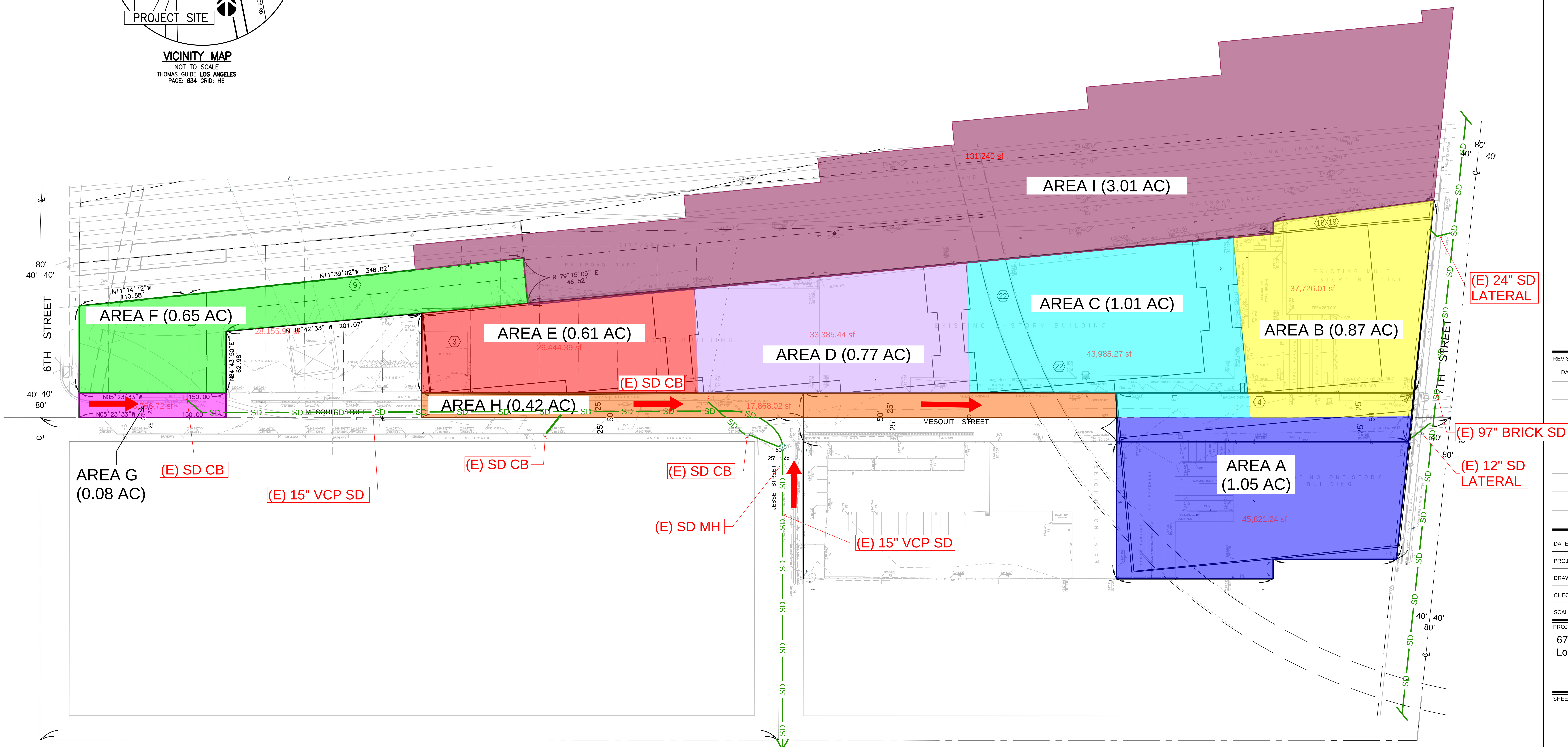


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| REVISIONS | | |
|---|---|---|
| DATE | △ | ISSUED FOR |

| | |
|---|---|
| DATE | 2/22/2017 |
| PROJECT NUMBER | 1600389 |
| DRAWN BY | DA |
| CHECKED BY | CJ |
| SCALE | 1" = 50' |

PROJECT DESCRIPTION

670 Mesquit Street
Los Angeles, CA 90021

SHEET NUMBER

FIGURE 2

FIGURE 4A

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Figure 3_Existing Conditions.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | A |
| Area (ac) | 2.74 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 8.6806 |
| Burned Peak Flow Rate (cfs) | 8.6806 |
| 24-Hr Clear Runoff Volume (ac-ft) | 1.2024 |
| 24-Hr Clear Runoff Volume (cu-ft) | 52377.8564 |

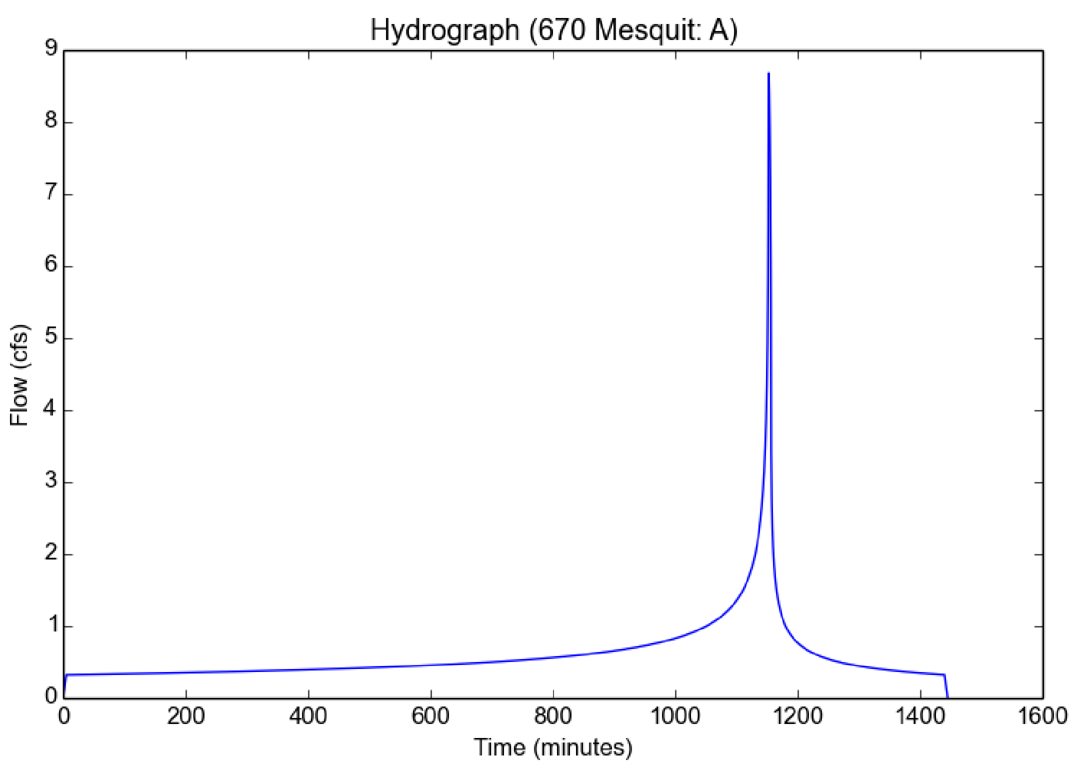


FIGURE 4B

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Figure 3_Existing Conditions.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | B |
| Area (ac) | 1.68 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 0.73 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.8887 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 5.2556 |
| Burned Peak Flow Rate (cfs) | 5.2556 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.5856 |
| 24-Hr Clear Runoff Volume (cu-ft) | 25509.4922 |

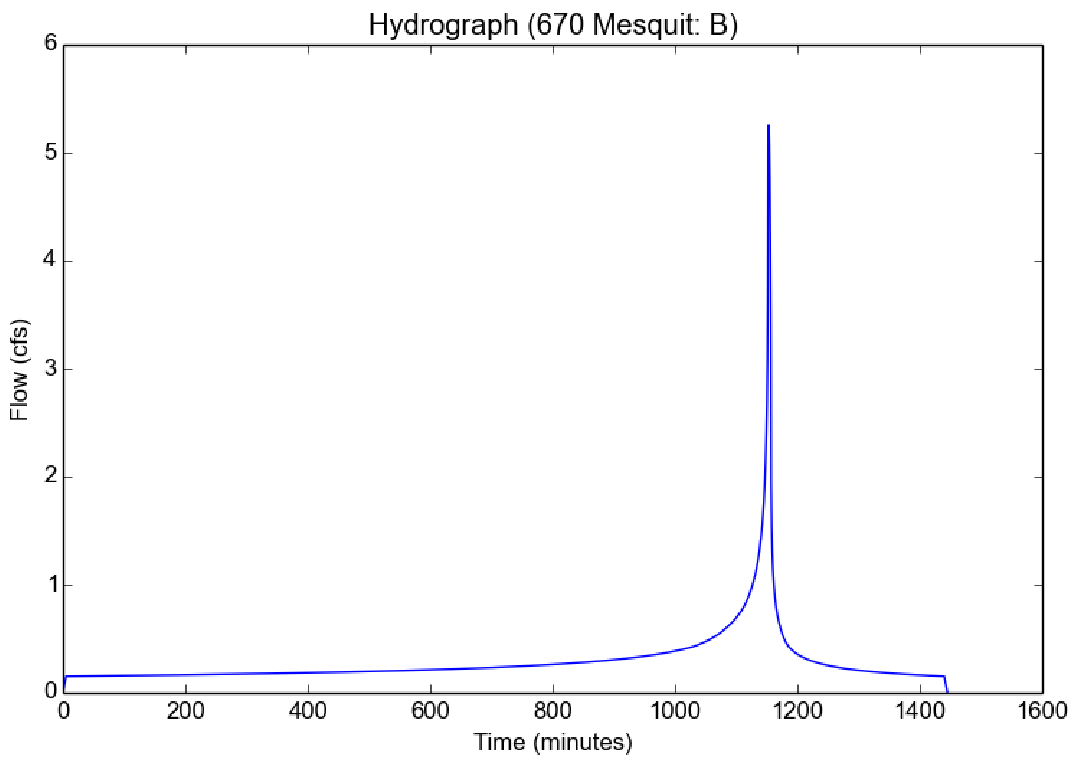


FIGURE 4C

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Figure 3_Existing Conditions.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | C |
| Area (ac) | 0.76 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 2.4077 |
| Burned Peak Flow Rate (cfs) | 2.4077 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.3335 |
| 24-Hr Clear Runoff Volume (cu-ft) | 14528.1646 |

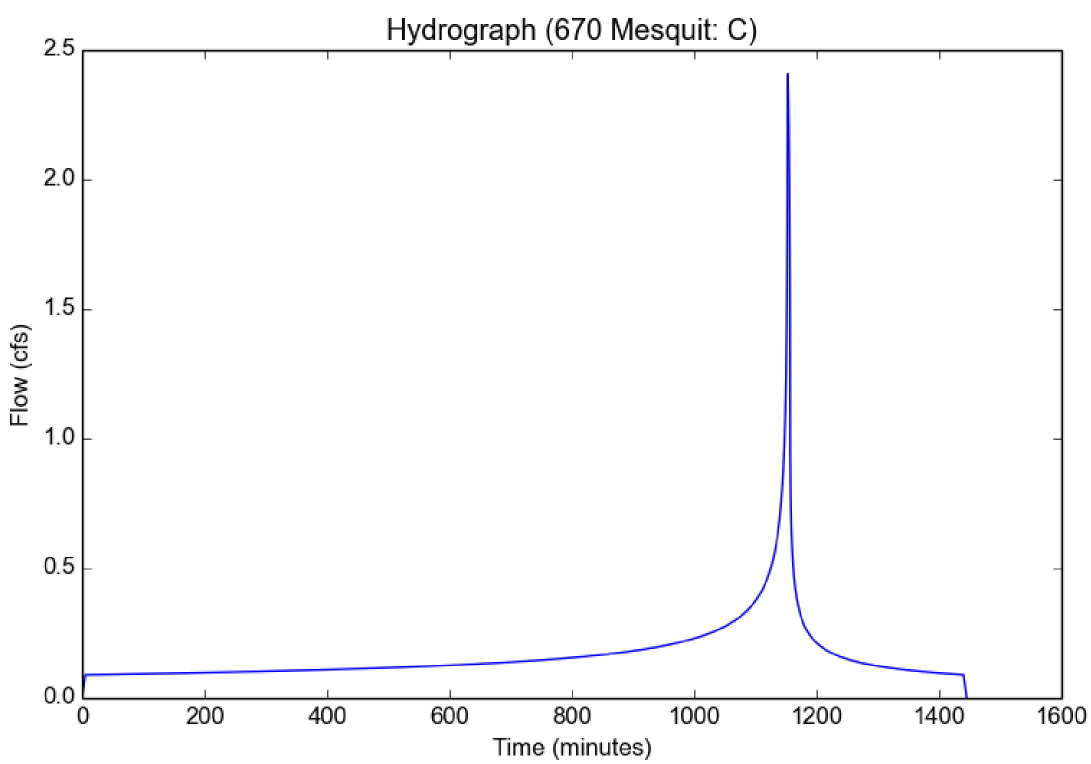


FIGURE 4D

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Figure 3_Existing Conditions.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | D |
| Area (ac) | 0.28 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 0.69 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.887 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 0.8743 |
| Burned Peak Flow Rate (cfs) | 0.8743 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.0939 |
| 24-Hr Clear Runoff Volume (cu-ft) | 4088.4858 |

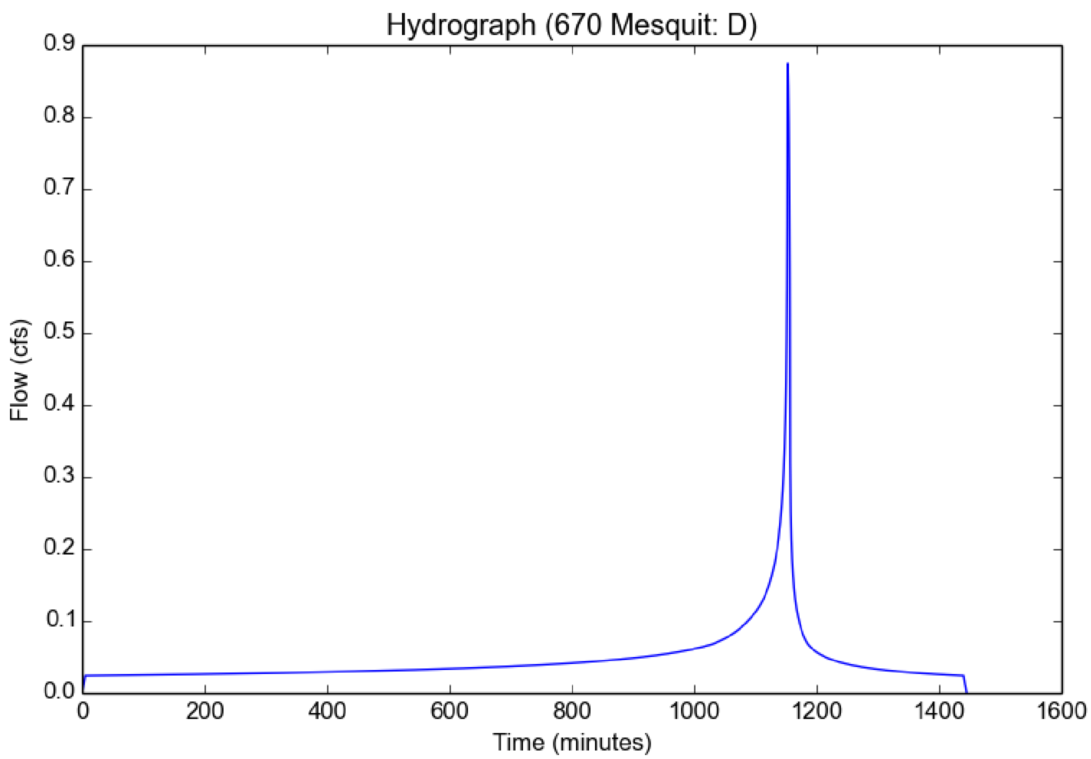


FIGURE 4E

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Existing Onsite Drainage - Area E.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | E |
| Area (ac) | 3.01 |
| Flow Path Length (ft) | 200.0 |
| Flow Path Slope (vft/hft) | 0.02 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 0.01 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.8586 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 9.097 |
| Burned Peak Flow Rate (cfs) | 9.097 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.3247 |
| 24-Hr Clear Runoff Volume (cu-ft) | 14145.3839 |

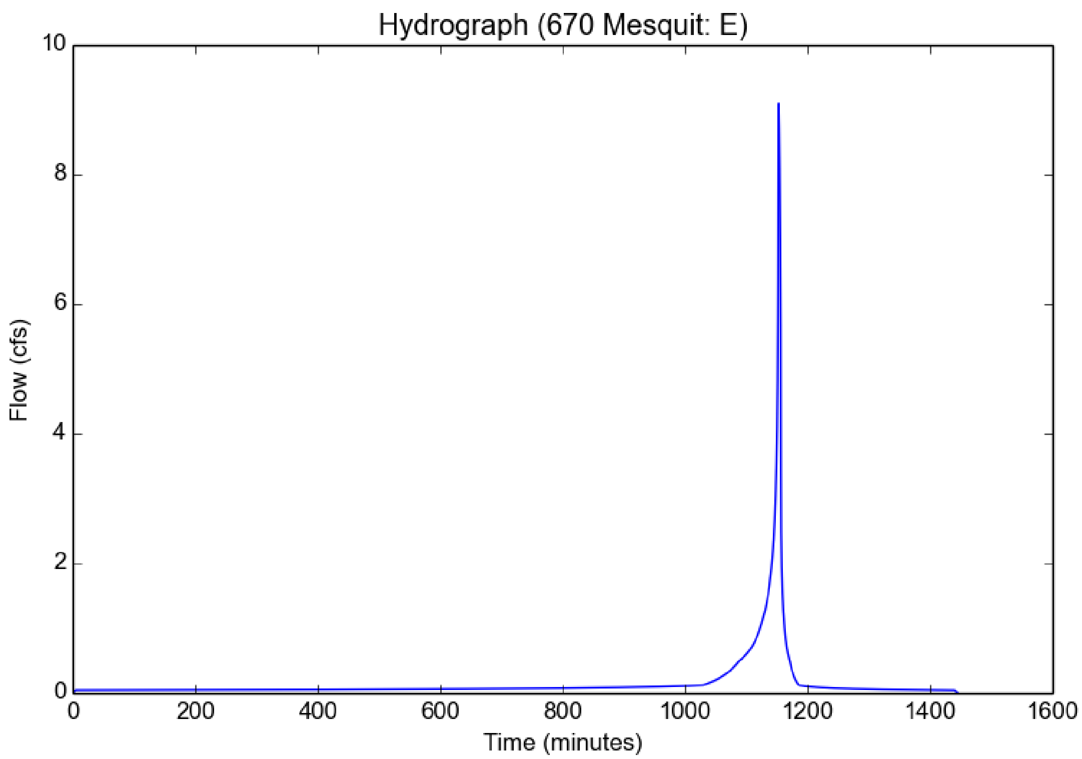


FIGURE 5A

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Fig 4_Proposed Condition.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | A |
| Area (ac) | 1.05 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 3.3265 |
| Burned Peak Flow Rate (cfs) | 3.3265 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.4608 |
| 24-Hr Clear Runoff Volume (cu-ft) | 20071.8063 |

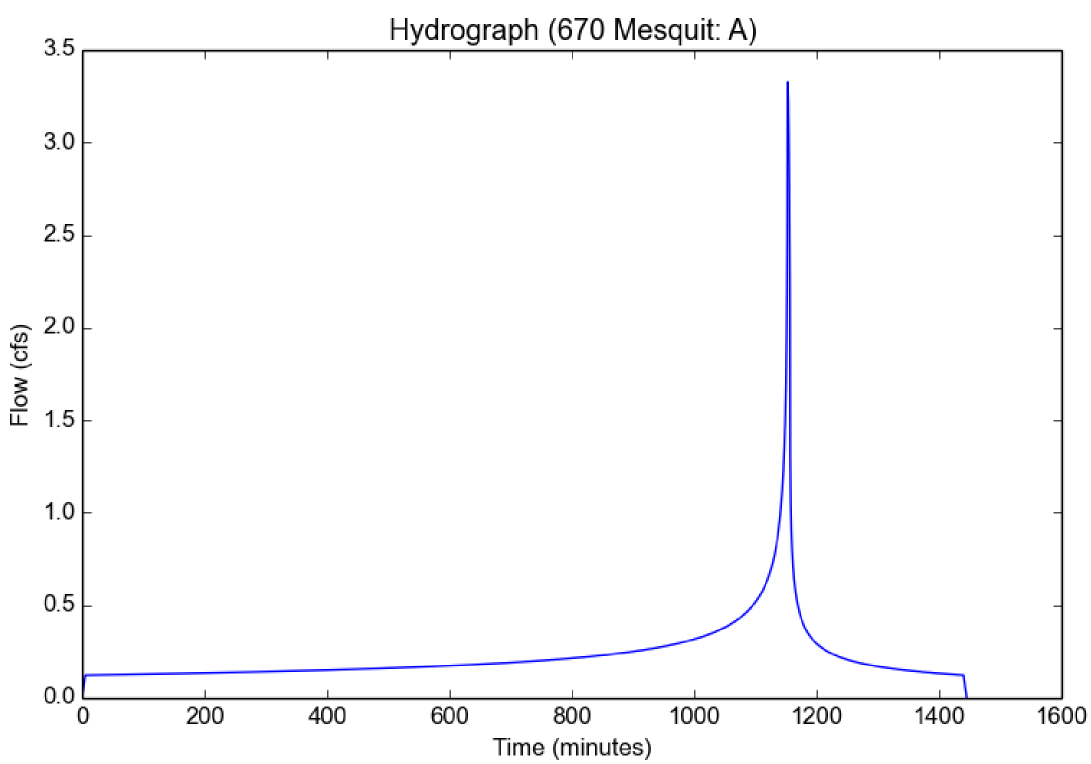


FIGURE 5B

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Fig 4_Proposed Condition.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | B |
| Area (ac) | 0.87 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 2.7562 |
| Burned Peak Flow Rate (cfs) | 2.7562 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.3818 |
| 24-Hr Clear Runoff Volume (cu-ft) | 16630.9252 |

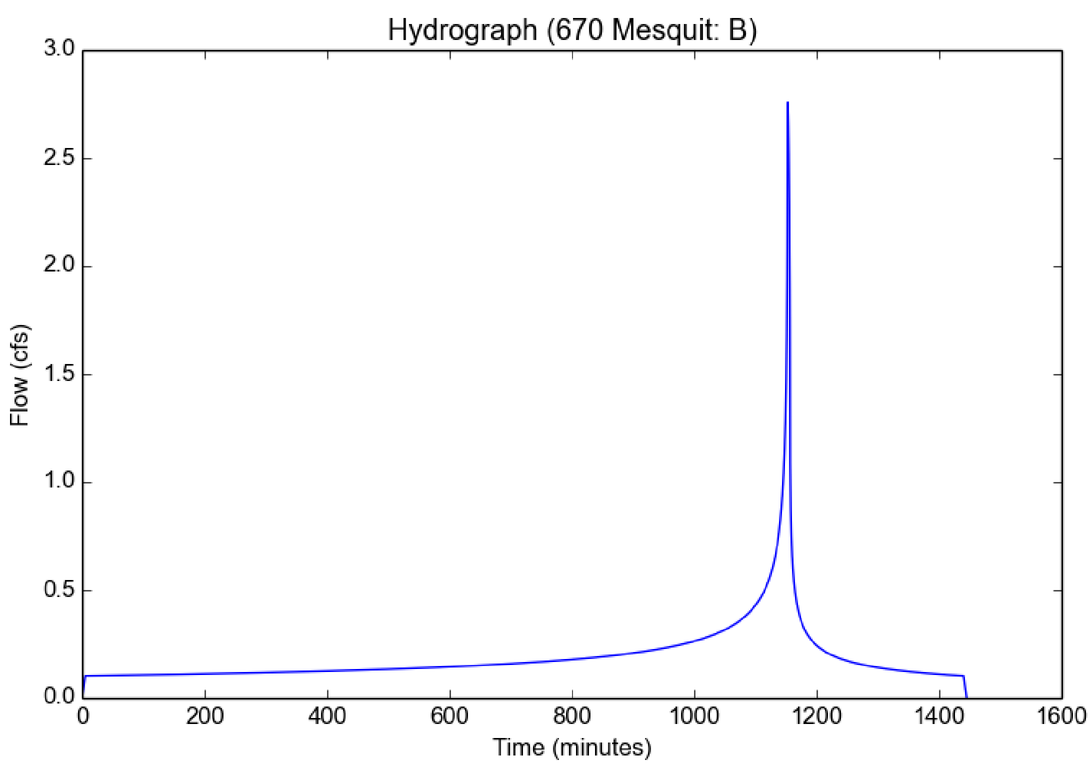


FIGURE 5C

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Fig 4_Proposed Condition.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | C |
| Area (ac) | 1.01 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 3.1998 |
| Burned Peak Flow Rate (cfs) | 3.1998 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.4432 |
| 24-Hr Clear Runoff Volume (cu-ft) | 19307.166 |

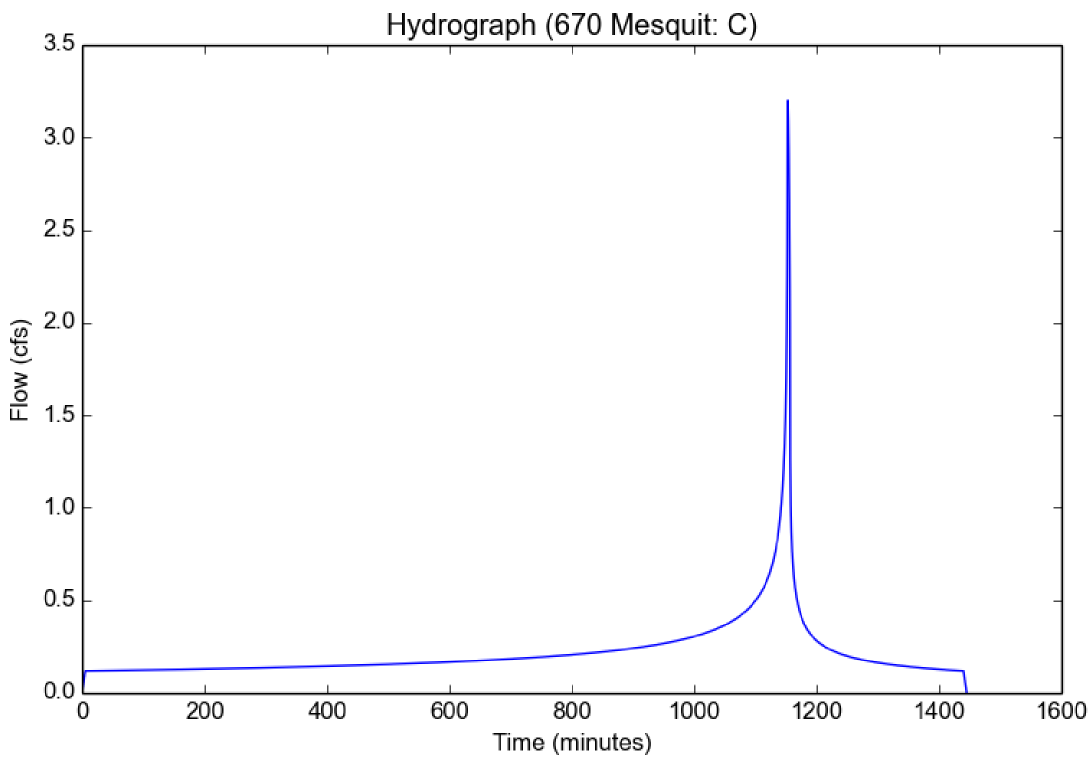


FIGURE 5D

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Fig 4_Proposed Condition.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | D |
| Area (ac) | 0.77 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 2.4394 |
| Burned Peak Flow Rate (cfs) | 2.4394 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.3379 |
| 24-Hr Clear Runoff Volume (cu-ft) | 14719.3246 |

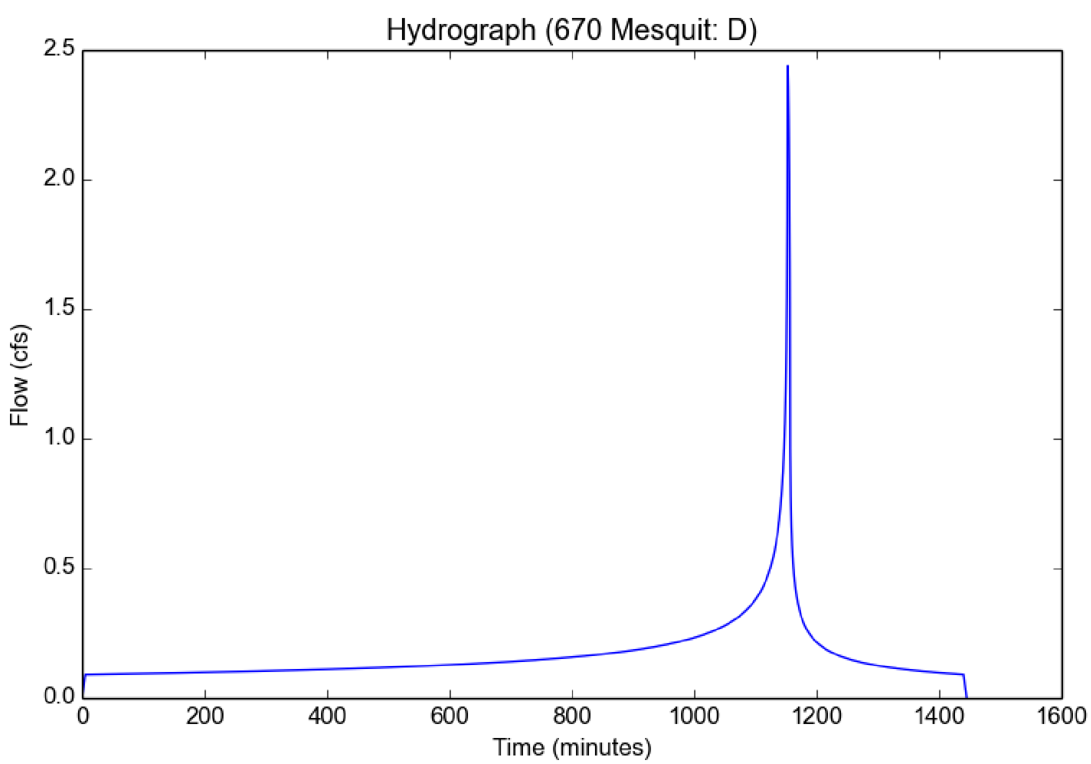


FIGURE 5E

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Fig 4_Proposed Condition.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | E |
| Area (ac) | 0.61 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 1.9325 |
| Burned Peak Flow Rate (cfs) | 1.9325 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.2677 |
| 24-Hr Clear Runoff Volume (cu-ft) | 11660.7637 |

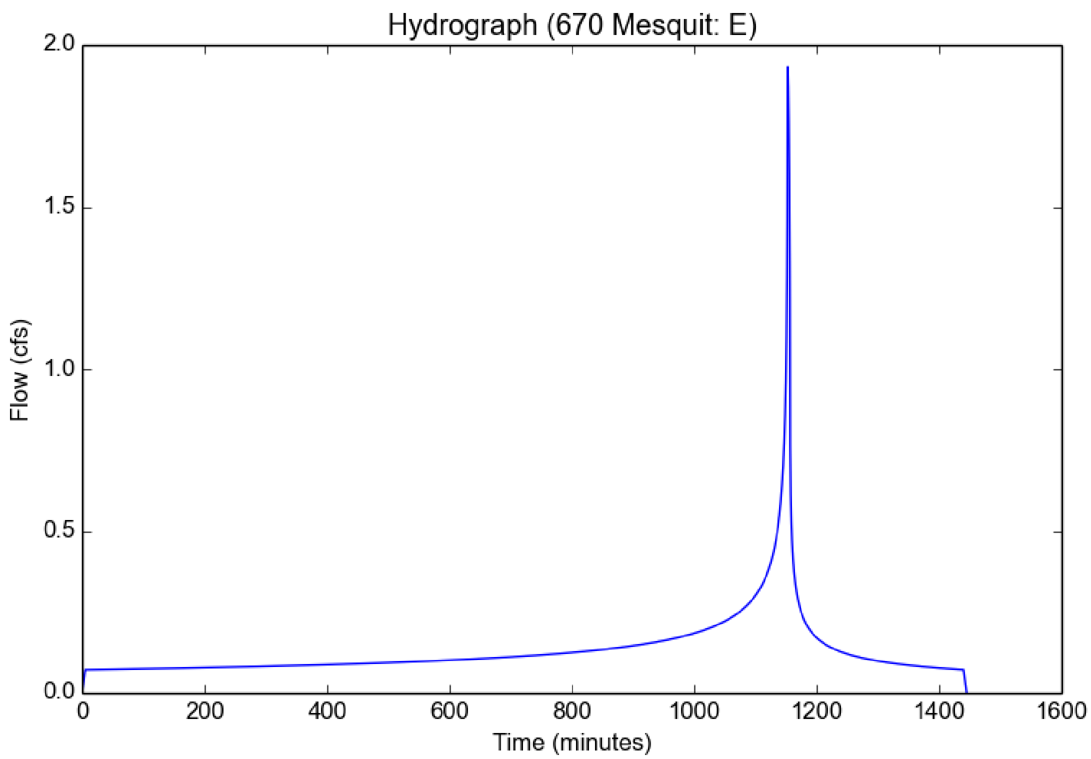


FIGURE 5F

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Fig 4_Proposed Condition.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | F |
| Area (ac) | 0.65 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 0.5 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.8791 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 2.0114 |
| Burned Peak Flow Rate (cfs) | 2.0114 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.1766 |
| 24-Hr Clear Runoff Volume (cu-ft) | 7692.7004 |

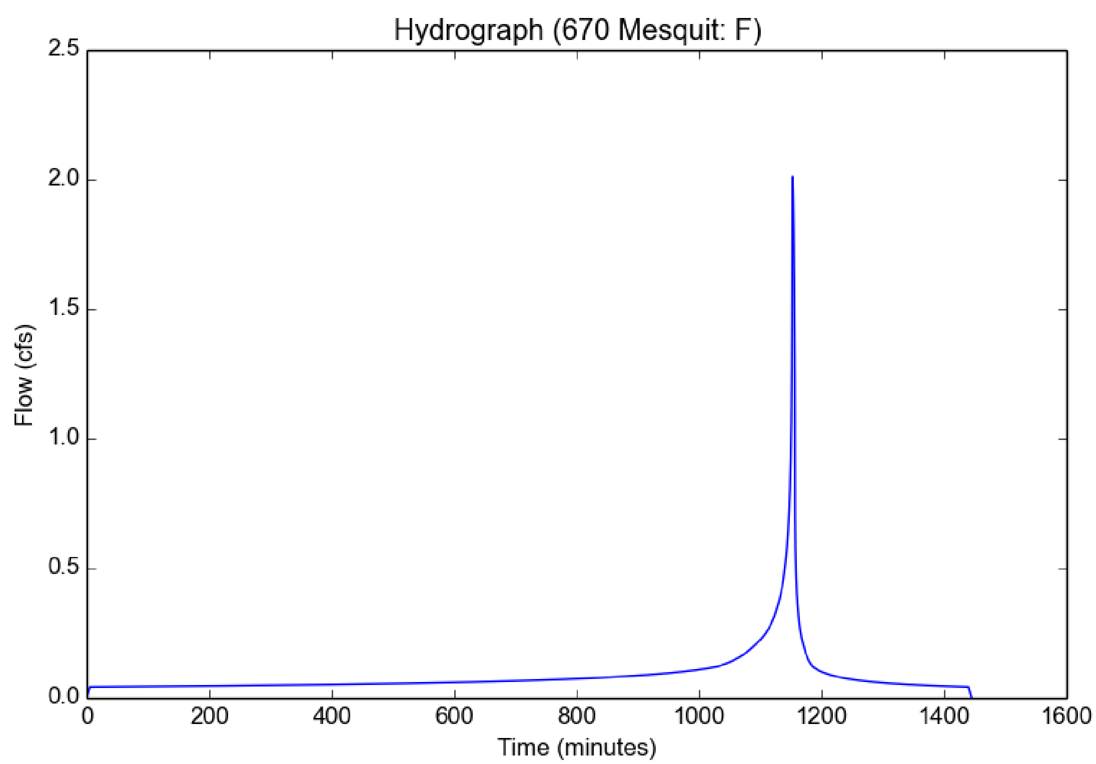


FIGURE 5G

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Fig 4_Proposed Condition.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | G |
| Area (ac) | 0.08 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 0.2534 |
| Burned Peak Flow Rate (cfs) | 0.2534 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.0351 |
| 24-Hr Clear Runoff Volume (cu-ft) | 1529.2805 |

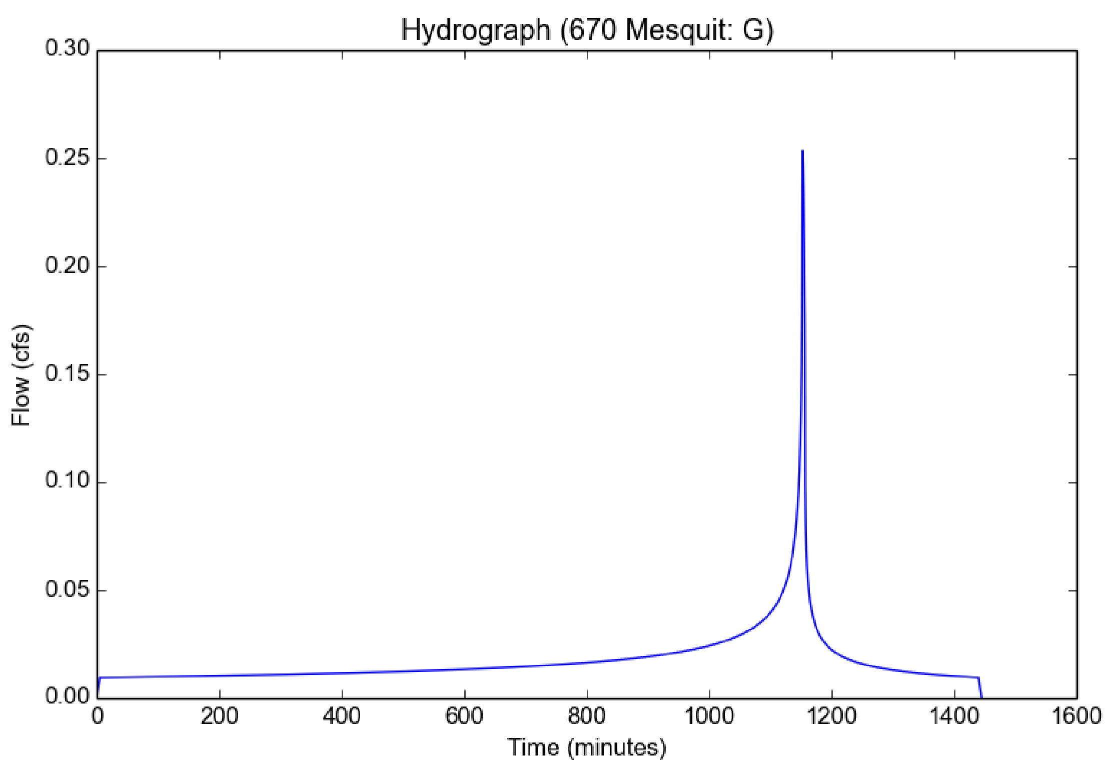


FIGURE 5H

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Fig 4_Proposed Condition.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | H |
| Area (ac) | 0.42 |
| Flow Path Length (ft) | 100.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 1.3306 |
| Burned Peak Flow Rate (cfs) | 1.3306 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.1843 |
| 24-Hr Clear Runoff Volume (cu-ft) | 8028.7225 |

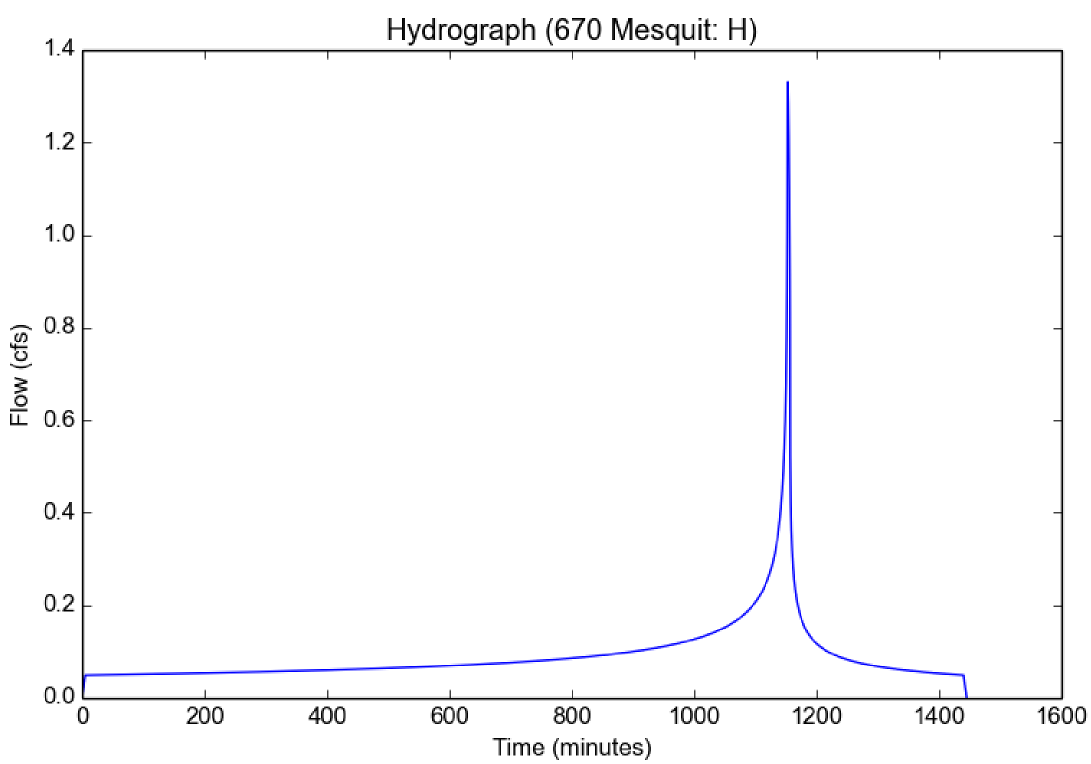


FIGURE 5I

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/EIR/Technical Reports/Attachments/Proposed Onsite Drainage - Area E.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | I |
| Area (ac) | 3.01 |
| Flow Path Length (ft) | 200.0 |
| Flow Path Slope (vft/hft) | 0.02 |
| 50-yr Rainfall Depth (in) | 5.9 |
| Percent Impervious | 1.0 |
| Soil Type | 6 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 5.9 |
| Peak Intensity (in/hr) | 3.5201 |
| Undeveloped Runoff Coefficient (Cu) | 0.8582 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 9.536 |
| Burned Peak Flow Rate (cfs) | 9.536 |
| 24-Hr Clear Runoff Volume (ac-ft) | 1.3209 |
| 24-Hr Clear Runoff Volume (cu-ft) | 57539.178 |

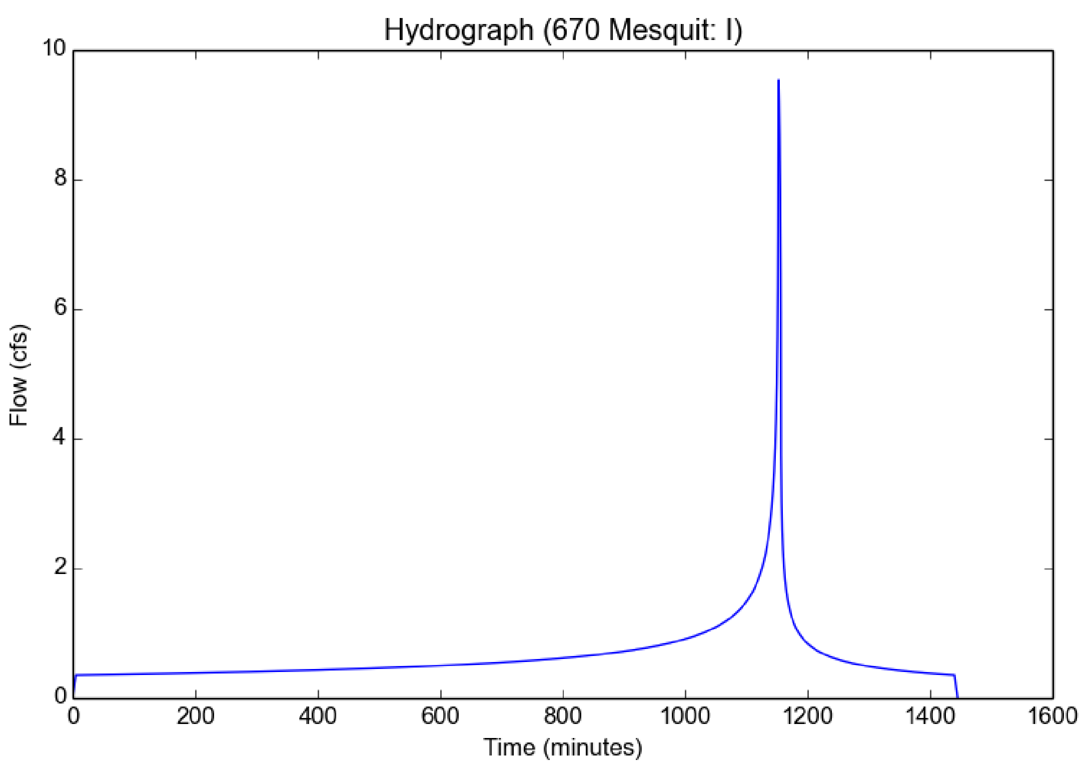


FIGURE 6

# Peak Flow Hydrologic Analysis

File location: P:/2016/1600382 670 Mesquit/ENGR/LID/2018-04-16_Mesquit - LID Proposed Site.pdf
Version: HydroCalc 1.0.2

## Input Parameters

| | |
|---|---|
| Project Name | Mesquit |
| Subarea ID | LID Proposed Site |
| Area (ac) | 5.464 |
| Flow Path Length (ft) | 200.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 85th Percentile Rainfall Depth (in) | 0.98 |
| Percent Impervious | 0.94 |
| Soil Type | 6 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.98 |
| Peak Intensity (in/hr) | 0.3604 |
| Undeveloped Runoff Coefficient (Cu) | 0.1 |
| Developed Runoff Coefficient (Cd) | 0.852 |
| Time of Concentration (min) | 14.0 |
| Clear Peak Flow Rate (cfs) | 1.6777 |
| Burned Peak Flow Rate (cfs) | 1.6777 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.377 |
| 24-Hr Clear Runoff Volume (cu-ft) | 16424.0378 |

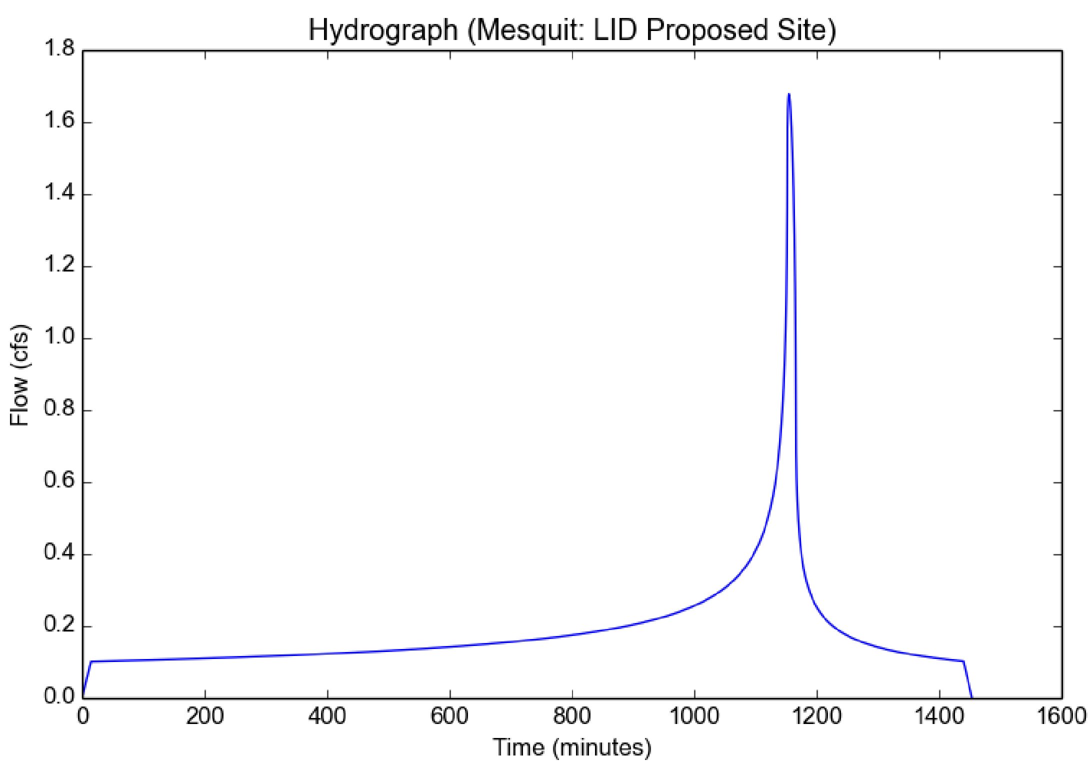


FIGURE 6

# Peak Flow Hydrologic Analysis

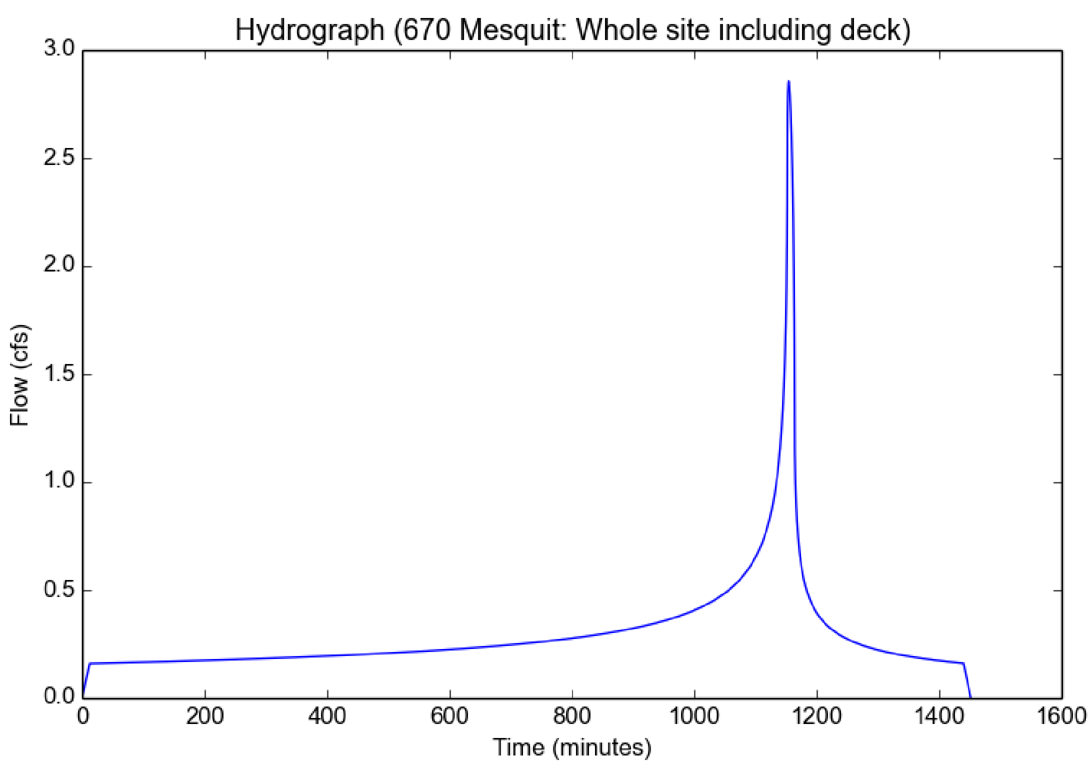
File location: P:/2016/1600382 670 Mesquit/ENGR/LID/Hydrology/2018-04-20_Mesquit - LID Proposed Site_96%_Impervious_Including_Deck.pdf
Version: HydroCalc 1.0.2

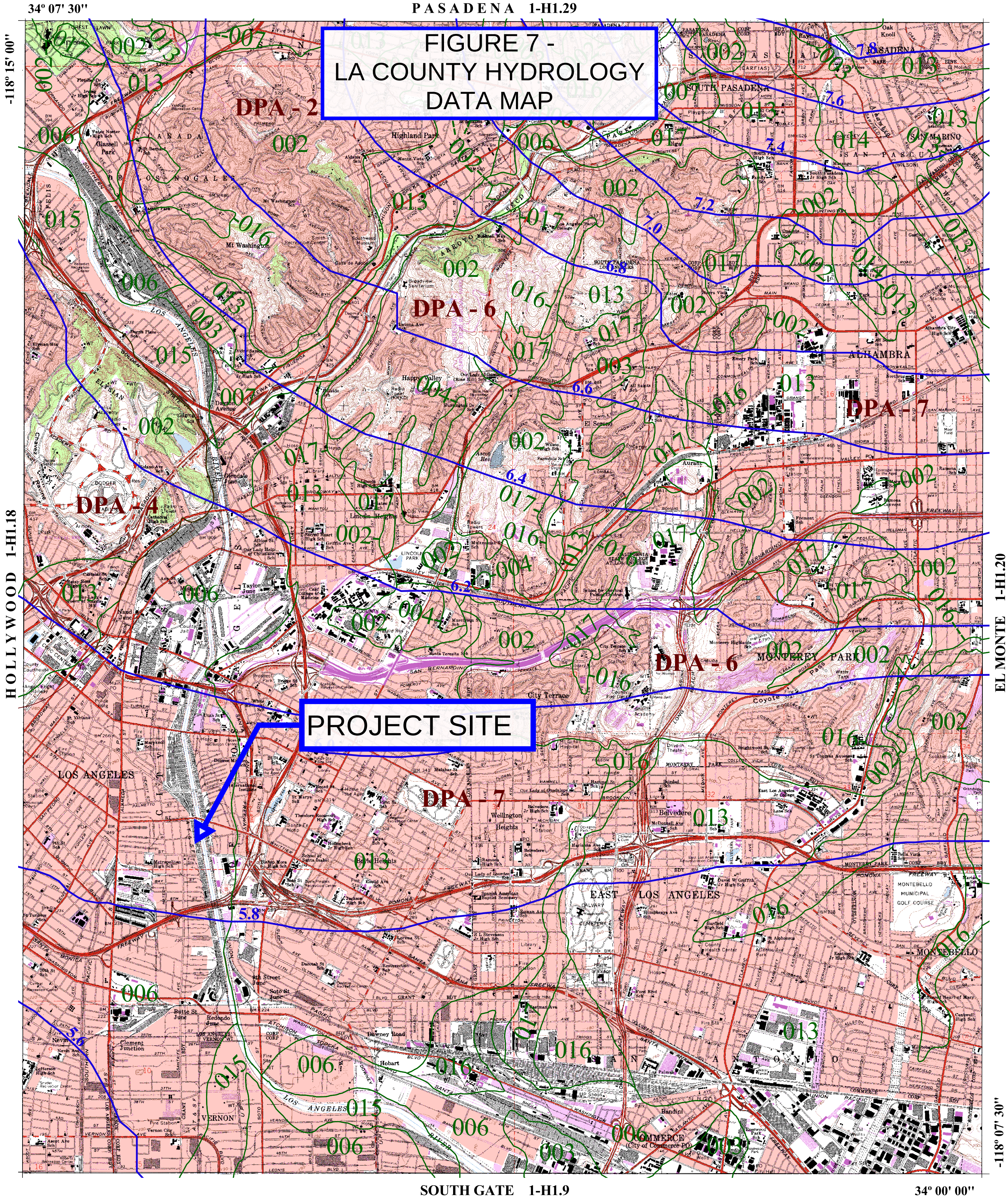
## Input Parameters

| | |
|---|---|
| Project Name | 670 Mesquit |
| Subarea ID | Whole site including deck |
| Area (ac) | 8.472 |
| Flow Path Length (ft) | 200.0 |
| Flow Path Slope (vft/hft) | 0.02 |
| 85th Percentile Rainfall Depth (in) | 0.98 |
| Percent Impervious | 0.961 |
| Soil Type | 6 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.98 |
| Peak Intensity (in/hr) | 0.3875 |
| Undeveloped Runoff Coefficient (Cu) | 0.13 |
| Developed Runoff Coefficient (Cd) | 0.87 |
| Time of Concentration (min) | 12.0 |
| Clear Peak Flow Rate (cfs) | 2.8558 |
| Burned Peak Flow Rate (cfs) | 2.8558 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.5962 |
| 24-Hr Clear Runoff Volume (cu-ft) | 25968.6488 |






1 0 1 2 Miles

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

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

# LOS ANGELES 1-H1.19
# 50-YEAR 24-HOUR ISOHYET

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

# COUNTY OF LOS ANGELES

# LOS ANGELES RIVER WATERSHED

FIGURE 8

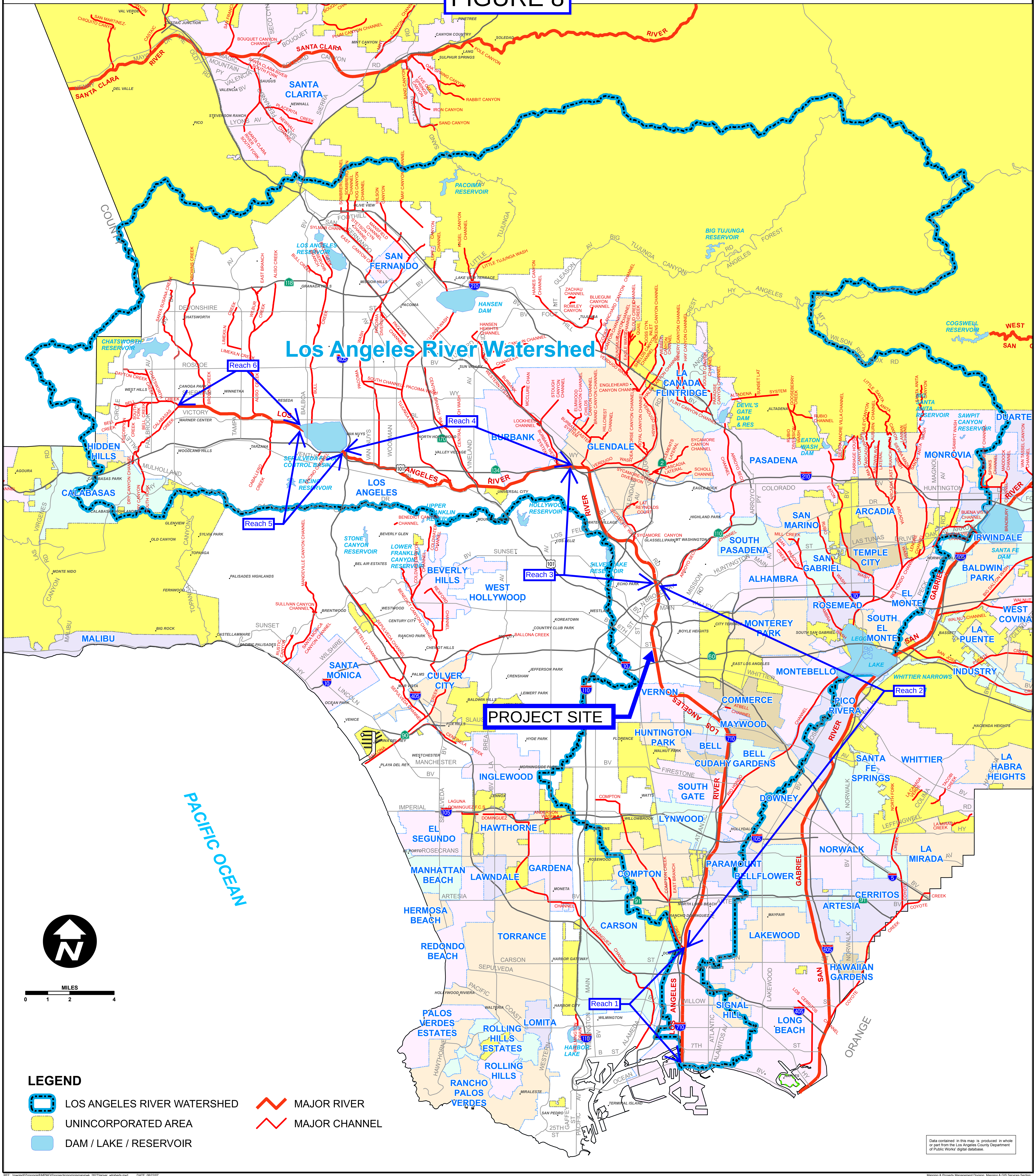
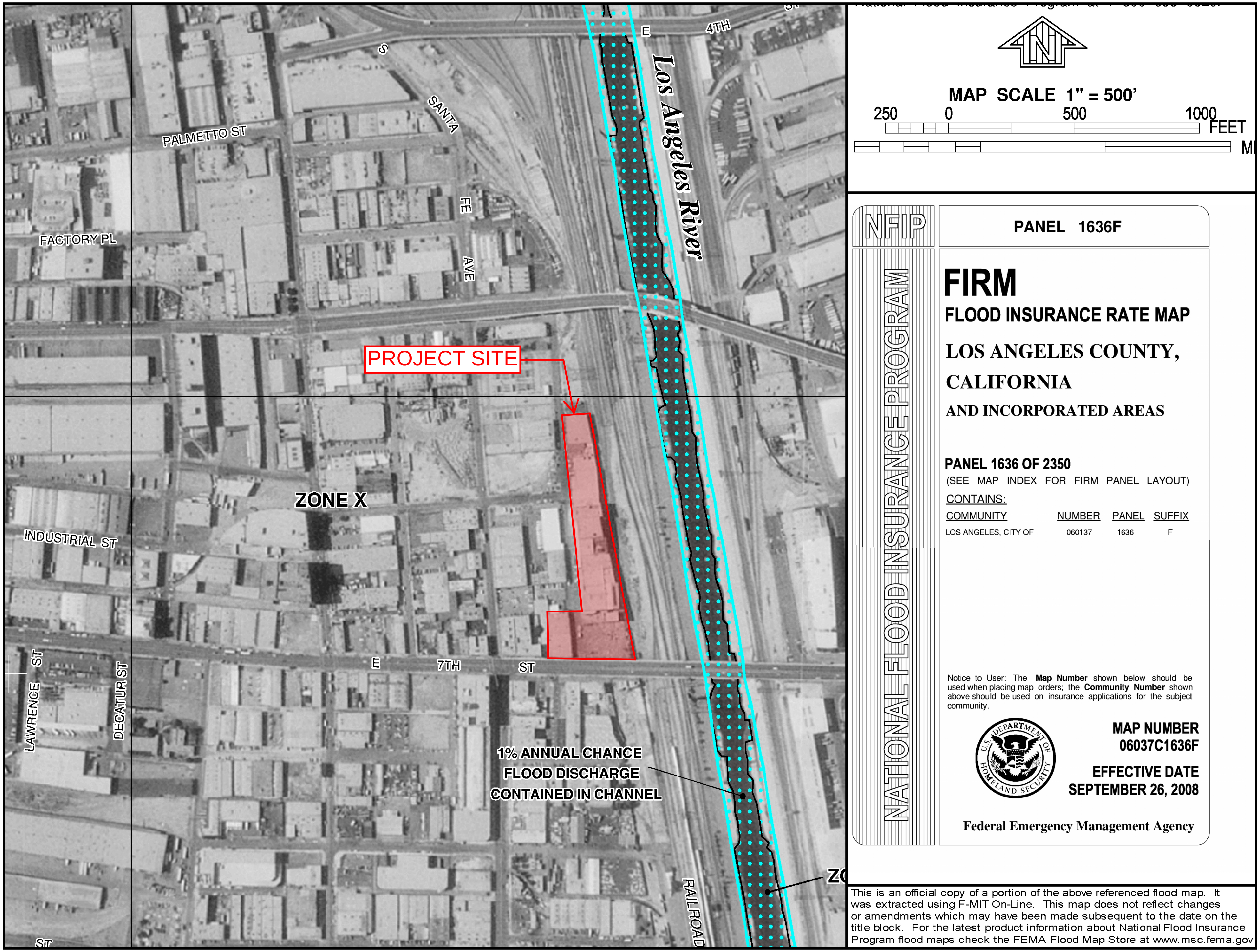
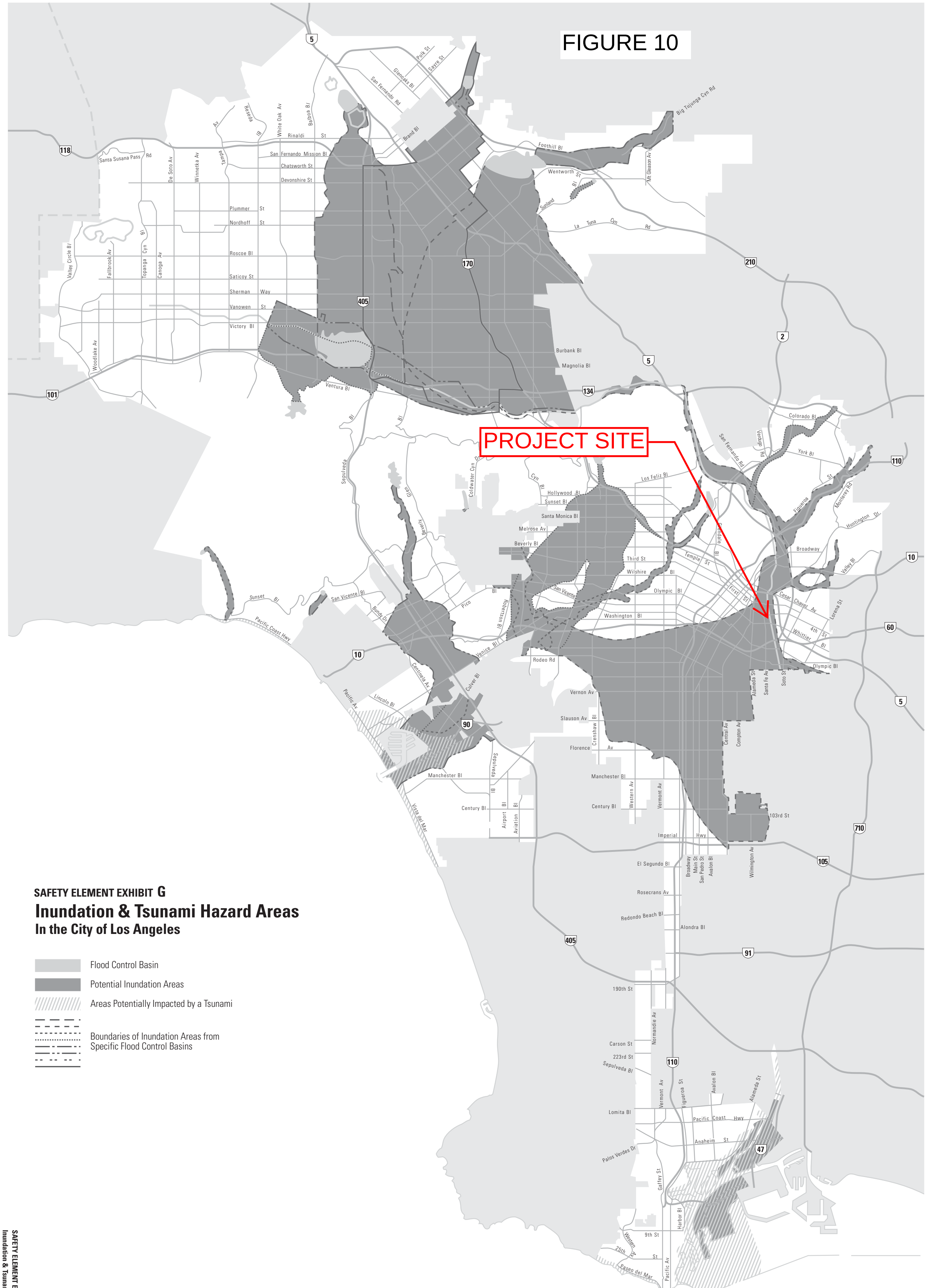


FIGURE 9



Los Angeles River
PROJECT SITE
ZONE X
1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CHANNEL
PALMETTO ST
FACTORY PL
INDUSTRIAL ST
E 4TH ST
S SANTA FE AVE
E 7TH ST
LAWRENCE ST
DECATUR ST
RAILROAD
MAP SCALE 1" = 500'
250 0 500 1000
FEET
NFIP
PANEL 1636F
FIRM
FLOOD INSURANCE RATE MAP
LOS ANGELES COUNTY, CALIFORNIA
AND INCORPORATED AREAS
PANEL 1636 OF 2350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
LOS ANGELES, CITY OF 060137 1636 F
NATIONAL FLOOD INSURANCE PROGRAM
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
U.S. DEPARTMENT OF HOMELAND SECURITY
MAP NUMBER 06037C1636F
EFFECTIVE DATE SEPTEMBER 26, 2008
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov




**SAFETY ELEMENT EXHIBIT G**

## Inundation & Tsunami Hazard Areas

### In the City of Los Angeles

- Flood Control Basin
- Potential Inundation Areas
- Areas Potentially Impacted by a Tsunami
- Boundaries of Inundation Areas from Specific Flood Control Basins

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*

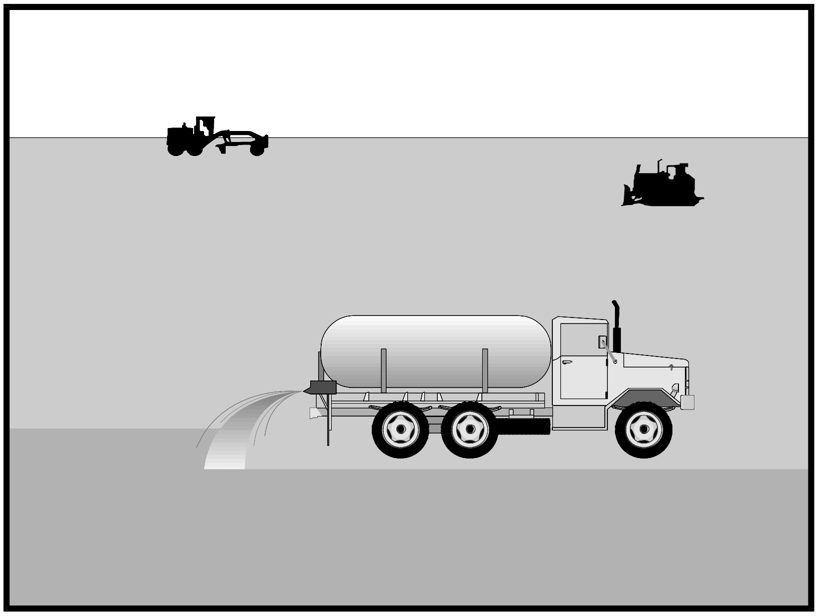
1 1/2 0 1 2 3 4 5 KILOMETERS

N

1 1/2 1/4 0 1 2 3 4 MILES

# Soil Binders





## Description and Purpose

Soil binding consists of application and maintenance of a soil stabilizer to exposed soil surfaces. Soil binders are materials applied to the soil surface to temporarily prevent water and wind induced erosion of exposed soils on construction sites.

## Suitable Applications

Soil binders are typically applied to disturbed areas requiring temporary protection. Because soil binders, when used as a stand-alone practice, can often be incorporated into the soil, they are a good alternative to mulches in areas where grading activities will soon resume. Soil binders are commonly used in the following areas:

- Rough graded soils that will be inactive for a short period of time
- Soil stockpiles
- Temporary haul roads prior to placement of crushed rock
- Compacted soil road base
- Construction staging, materials storage, and layout areas

## Limitations

- Soil binders are temporary in nature and may need reapplication.

### Categories

| | | |
|---|---|---|
| **EC** | Erosion Control | ☑ |
| **SE** | Sediment Control | |
| **TC** | Tracking Control | |
| **WE** | Wind Erosion Control | ☒ |
| **NS** | Non-Stormwater Management Control | |
| **WM** | Waste Management and Materials Pollution Control | |

**Legend:**

☑ **Primary Category**

☒ **Secondary Category**

### Targeted Constituents

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

### Potential Alternatives

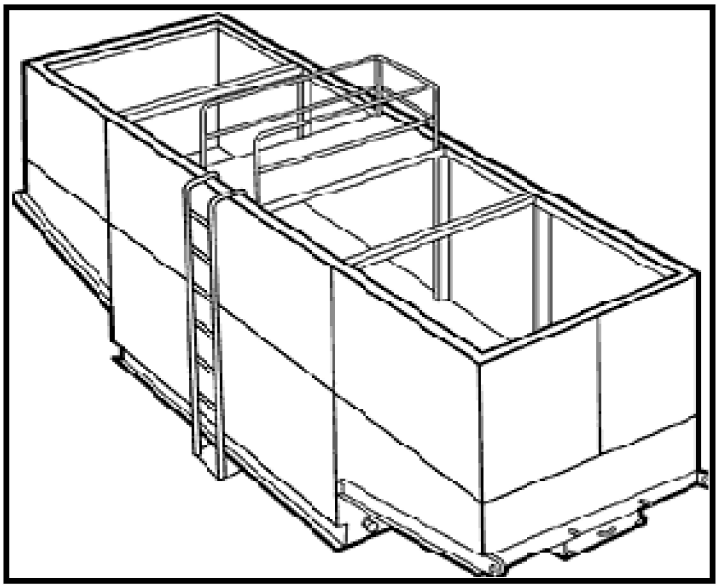
EC-3 Hydraulic Mulch

EC-4 Hydroseeding

EC-6 Straw Mulch

EC-7 Geotextiles and Mats

EC-8 Wood Mulching



### 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

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 Effluent Limits (NEL) and 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 exceedences of the General Permit requirements.

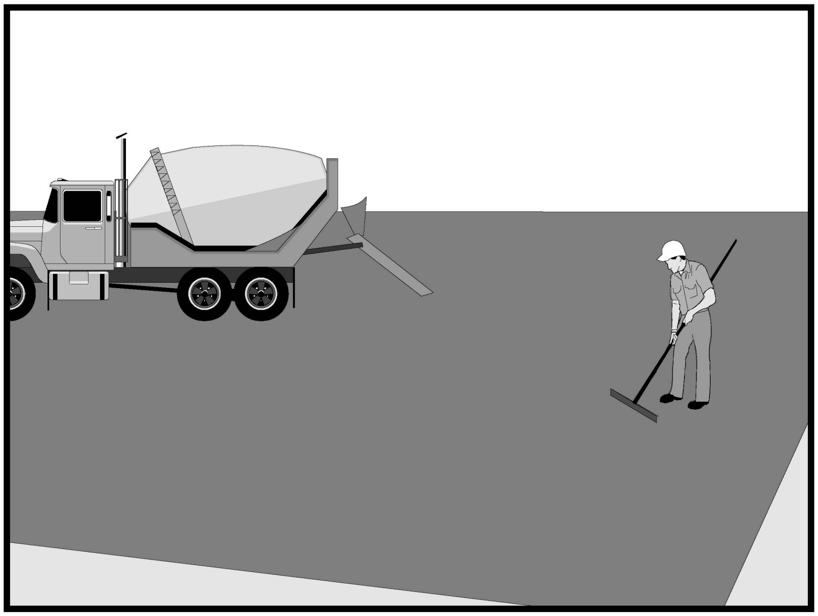
## Suitable Applications

These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area to facilitate construction.

Practices identified in this section are also appropriate for implementation when managing the removal of accumulated precipitation (stormwater) from depressed areas at a construction site.

Stormwater mixed with non-stormwater should be managed as non-stormwater.

# 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 Effluent Limits (NEL) and 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.

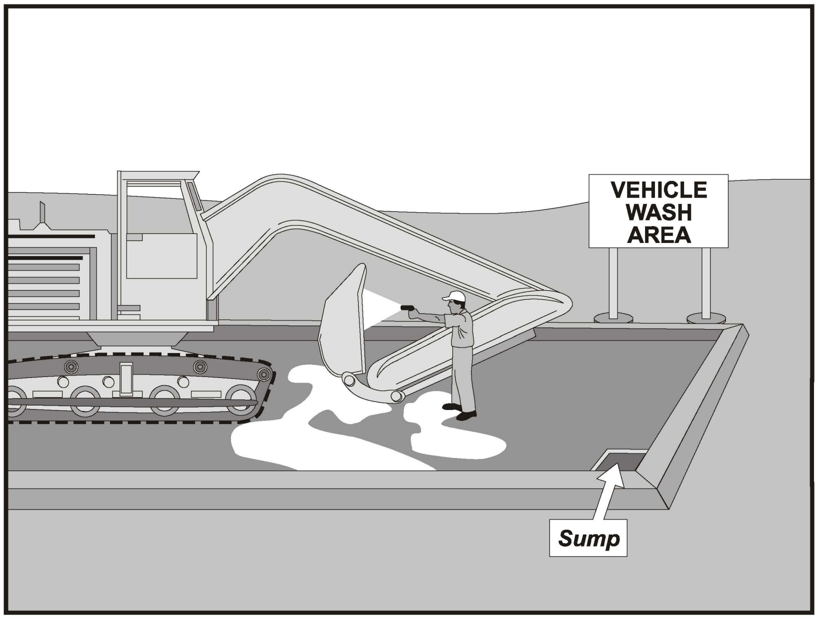
## Suitable Applications

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




## 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:

### 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:**

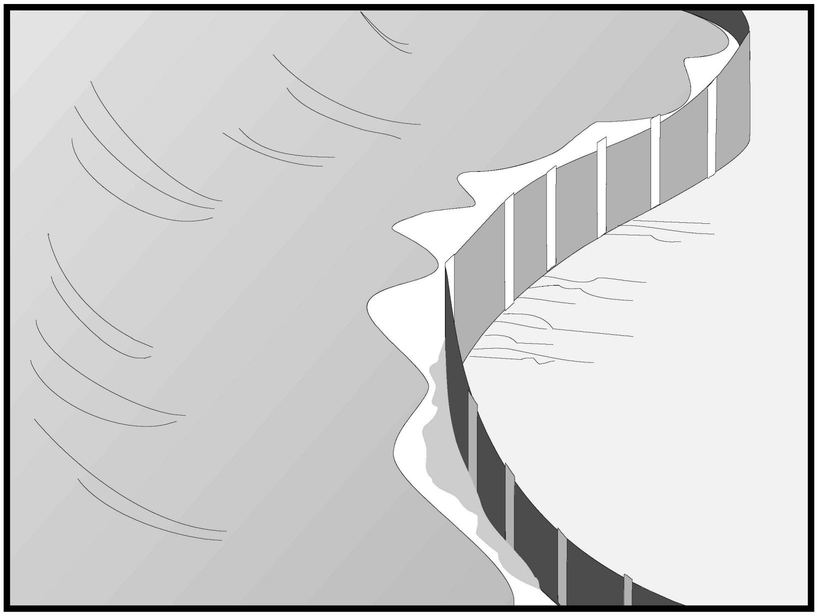
☑ **Primary Objective**

☒ **Secondary Objective**

### Targeted Constituents

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

### Potential Alternatives
None



## 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 Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-10 Storm Drain Inlet Protection

SE-14 Biofilter Bags

## Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

## Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (SE-10). Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls. Suitable applications include:

- Along the perimeter of a project.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

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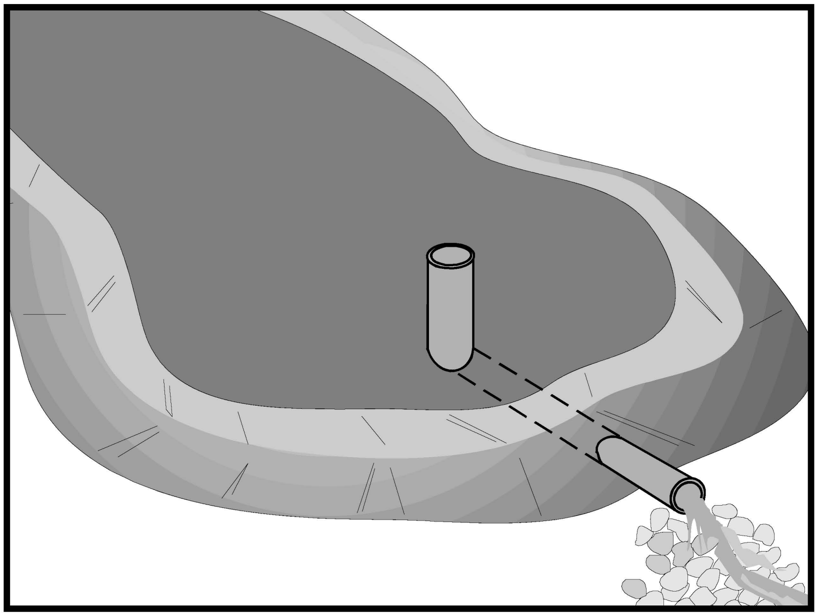

### Categories

| | | |
|---|---|---|
| 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-3 Sediment Trap (for smaller areas)

## Description and Purpose

A sediment basin is a temporary basin formed by excavation or by constructing an embankment so that sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out before the runoff is discharged.

Sediment basin design guidance presented in this fact sheet is intended to provide options, methods, and techniques to optimize temporary sediment basin performance and basin sediment removal. Basin design guidance provided in this fact sheet is not intended to guarantee basin effluent 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 basins should be used in conjunction with a comprehensive system of BMPs that includes:

- Diverting runoff from undisturbed areas away from the basin
- Erosion control practices to minimize disturbed areas on-site
  and to provide temporary stabilization and interim sediment controls (e.g., stockpile perimeter control, check dams, perimeter controls around individual lots) to reduce the basin's influent sediment concentration.

At some sites, sediment basin design enhancements may be required to adequately remove sediment. Traditional

# 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.
- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.

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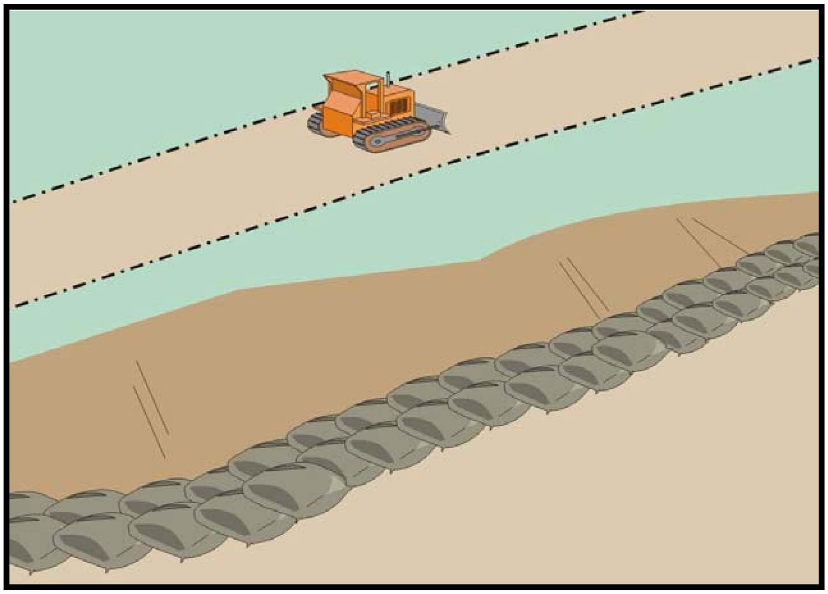


## Categories

| | | |
|---|---|---|
| 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-14 Biofilter Bags

## Description and Purpose

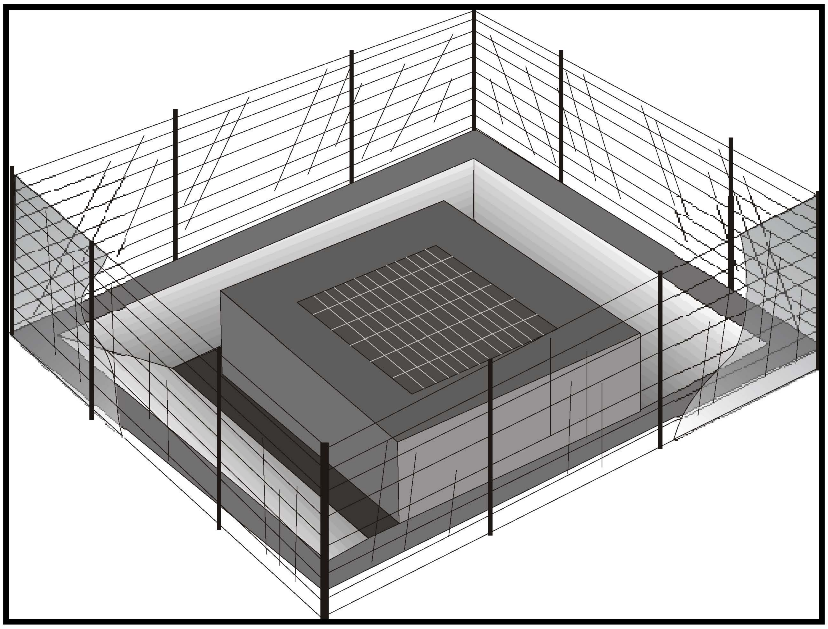
A sandbag barrier is a series of sand-filled bags placed on a level contour to intercept or to divert sheet flows. Sandbag barriers placed on a level contour pond sheet flow runoff, allowing sediment to settle out.

## Suitable Applications

Sandbag barriers may be 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 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.

# Storm Drain Inlet Protection SE-10



### 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

## 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.

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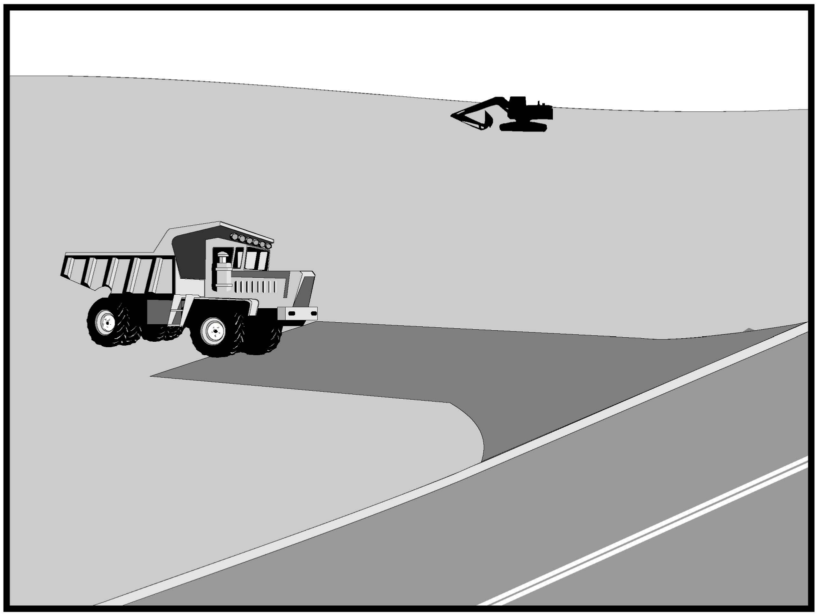
# Stabilized Construction Entrance/Exit TC-1



## 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

### Categories

| | | |
|---|---|---|
| **EC** | Erosion Control | ☒ |
| **SE** | Sediment Control | ☒ |
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| **NS** | Non-Stormwater Management Control | |
| **WM** | Waste Management and Materials Pollution Control | |

**Legend:**

☑ **Primary Objective**

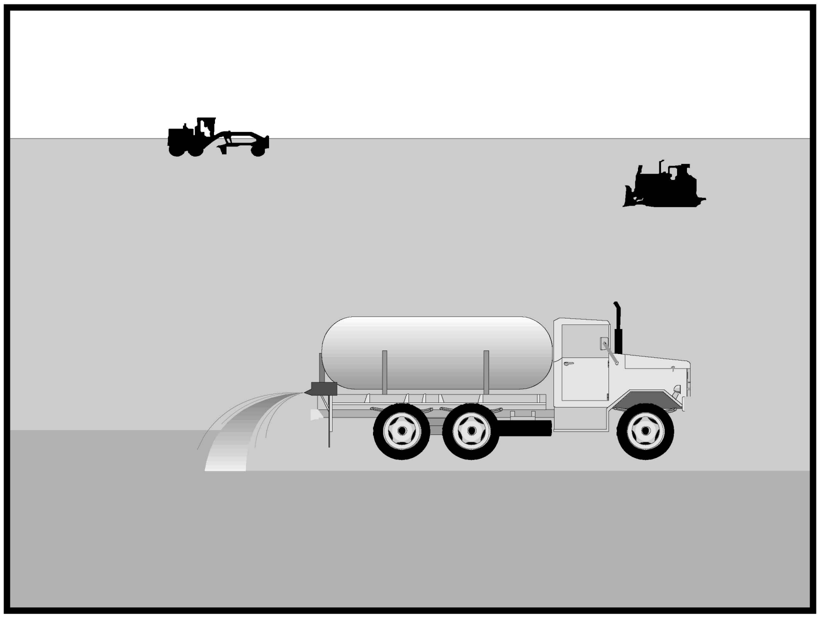
☒ **Secondary Objective**

### Targeted Constituents

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

### Potential Alternatives

None



## Categories

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**Legend:**

☑ **Primary Category**

☒ **Secondary Category**

## Targeted Constituents

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

## Potential Alternatives

EC-5 Soil Binders

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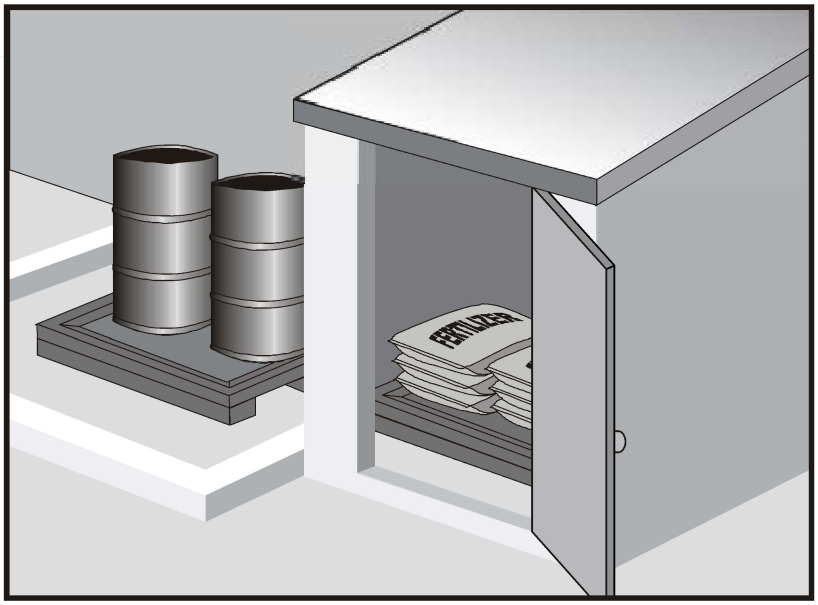
## Description and Purpose

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

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

## Suitable Applications

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




## 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, 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

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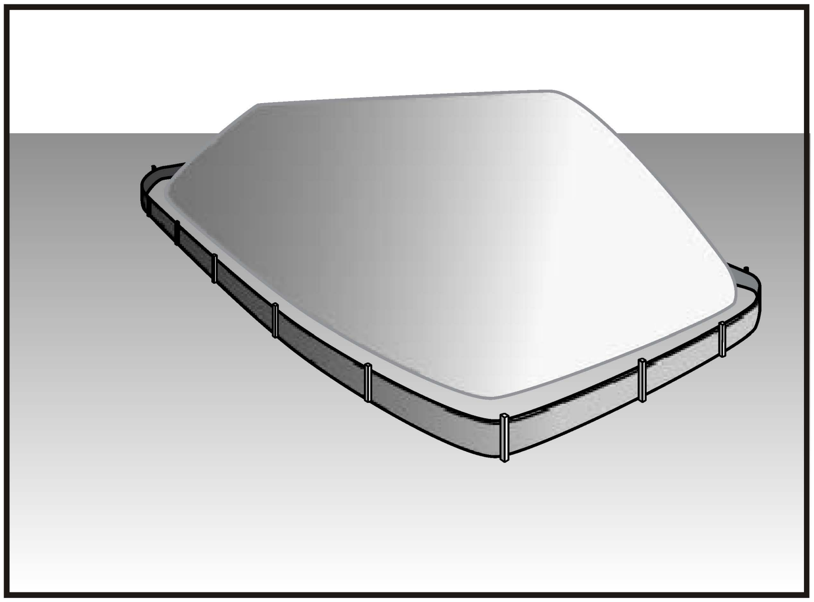
# Stockpile Management



### Categories

| | | |
|---|---|---|
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| SE | Sediment Control | ☒ |
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| 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:

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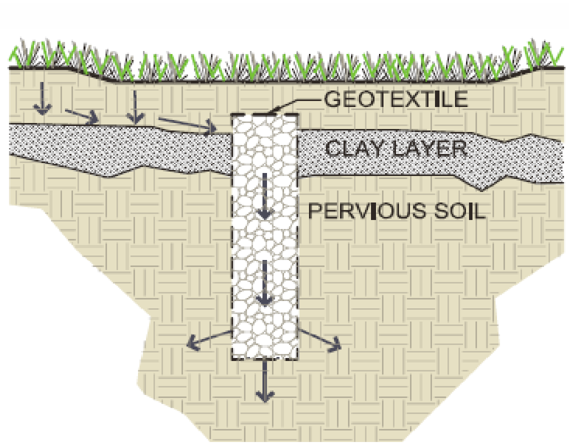
EXHIBIT 2

TYPICAL LID
INFILTRATION BMPs

**Dry Wells**

A dry well is defined as an excavated, bored, drilled, or driven shaft or hole whose depth is greater than its width. Drywells are similar to infiltration trenches in their design and function, as they are designed to temporarily store and infiltrate runoff, primarily from rooftops or other impervious areas with low pollutant loading. A dry well may be either a drilled borehole filled with aggregate or a prefabricated storage chamber or pipe segment.




**Bioretention**

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, plantings, and, optionally, a subsurface gravel reservoir layer.