

Preliminary Hydrology and Low Impact Development (LID) Report

1450 West Artesia Boulevard
Gardena, California

August 3, 2022

Prepared For:



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REFERENCES

Hydrology Manual. Los Angeles County Department of Public Works, January, 2006.

Los Angeles County Hydrology Map website; <https://dpw.lacounty.gov/wrd/hydrologygis/>. Accessed June 22, 2022.

Low Impact Standards Development Manual. County of Los Angeles Department of Public Works, February 2014.

1. INTRODUCTION

This report documents the results of an Acoustical Assessment completed for the 1450 Artesia Boulevard Specific Plan Project (Project). The purpose of this Acoustical Assessment is to evaluate the Project's potential construction and operational noise and vibration impacts.

1.1 Project Location

The proposed Project is located at 1450 Artesia Boulevard in the City of Gardena (City), California, just northeast of the City's border with the City of Torrance. The City is in southwest Los Angeles County and is bordered by the unincorporated West Athens community and the City of Hawthorne to the north, the cities of Los Angeles and Torrance to the south, the city of Los Angeles to the east, and the cities of Torrance, and Hawthorne and Los Angeles County to the west; see [Exhibit 1: Regional Vicinity Map](#) and [Exhibit 2: Site Vicinity Map](#).

The site is occupied by four buildings totaling approximately 12,064 gross square feet (GSF) (circa 1950) and associated surface parking lot. Preliminarily, it is assumed the existing buildings are occupied by two commercial uses (i.e., a U-Haul dealer and sandblasting service). For analysis purposes, it is assumed all onsite improvements would be removed and replaced with the proposed mixed-use development. Surrounding land uses include commercial to the north and west, residential and commercial to the south (potentially abandoned), and a vacant lot to the east. The Project site is designated Specific Plan and zoned 1450 Artesia Specific Plan. Surrounding areas to the south and west are also zoned Artesia Corridor Specific Plan. Regional access to the site is provided by State Route 91 (SR-91) freeway, located approximately 0.9 miles east of the Project site, the Interstate 110 (I-110) freeway, located approximately 0.9 miles east of the site, and the Interstate 405 (I-405) freeway located approximately 0.9 miles west of the site.

1.2 Project Description

Overview. The proposed Project is comprised of one industrial/commercial mixed-use development comprised of a 268,000 GSF building with associated surface parking (approximately 107 off-street parking spaces), along with landscape and circulation improvements, as shown in [Exhibit 3: Conceptual Site Plan](#).

The proposed building would contain a self-storage use (four levels totaling 186,000 GSF), an industrial use (one level totaling 72,000 GSF plus ten loading docks), and an office/retail use (a mezzanine totaling 10,000 GSF). As noted in Chapter 5 of the 1450 Artesia Specific Plan, the Project permits warehouse, distribution, product delivery, wholesale, e-commerce, and storage uses (fulfillment-center uses which involve sorting are prohibited). For environmental analyses which depend on industrial land use type, this analysis is based on the light industrial land use, because although a warehouse use generates incrementally more truck traffic (approximately 6 additional heavy-duty truck trips per day), the warehouse use results in far fewer automobile trips. Thus, a light industrial land use would have the greatest overall trips and represents the "worst-case" for environmental analysis. See **Appendix L3: Revised Trip Generation Memo**.

Special Events

Additionally, the City of Gardena is proposing to host various special events on an approximately 36,000-square-foot portion (0.8 acre) of the industrial use's parking area (over approximately 63 parking spaces). The special events would be held approximately two to three times per month, including weekday evening events (after 6 PM) and weekend daytime events. During these events, the businesses would remain in operation, but drive aisles would be modified to protect the attendees.

The City anticipates hosting several types of medium-size special events, including the following:

- Food trucks
- Farmer's markets
- Car shows
- Live entertainment
- Food giveaways
- Mobile vaccination events

Site Access

Vehicular access to the site would be provided via one 35-foot driveway on Artesia Boulevard. The Project driveway will only service the Project. Additionally, there is a separate 35-foot exit driveway adjacent to the entrance, divided by a 20-foot divide.

Parking

Parking would be located along the northeastern portion of the site. The proposed Project would provide 124 automobile parking stalls and 10 dock doors. The dock doors will be oriented to face west. Daily activities within the Project site will include maneuvering forklifts, lift equipment, and large semi-trucks through and around the site and backing into the loading docks.

Project Phasing and Construction

The construction timeline, contingent on planning, zoning, and construction document approval, is anticipated to start June 2023 and end December 2024 (18 months or 487 days). The proposed Project is anticipated to begin operations in January 2025.

Exhibit 1: Regional Vicinity Map

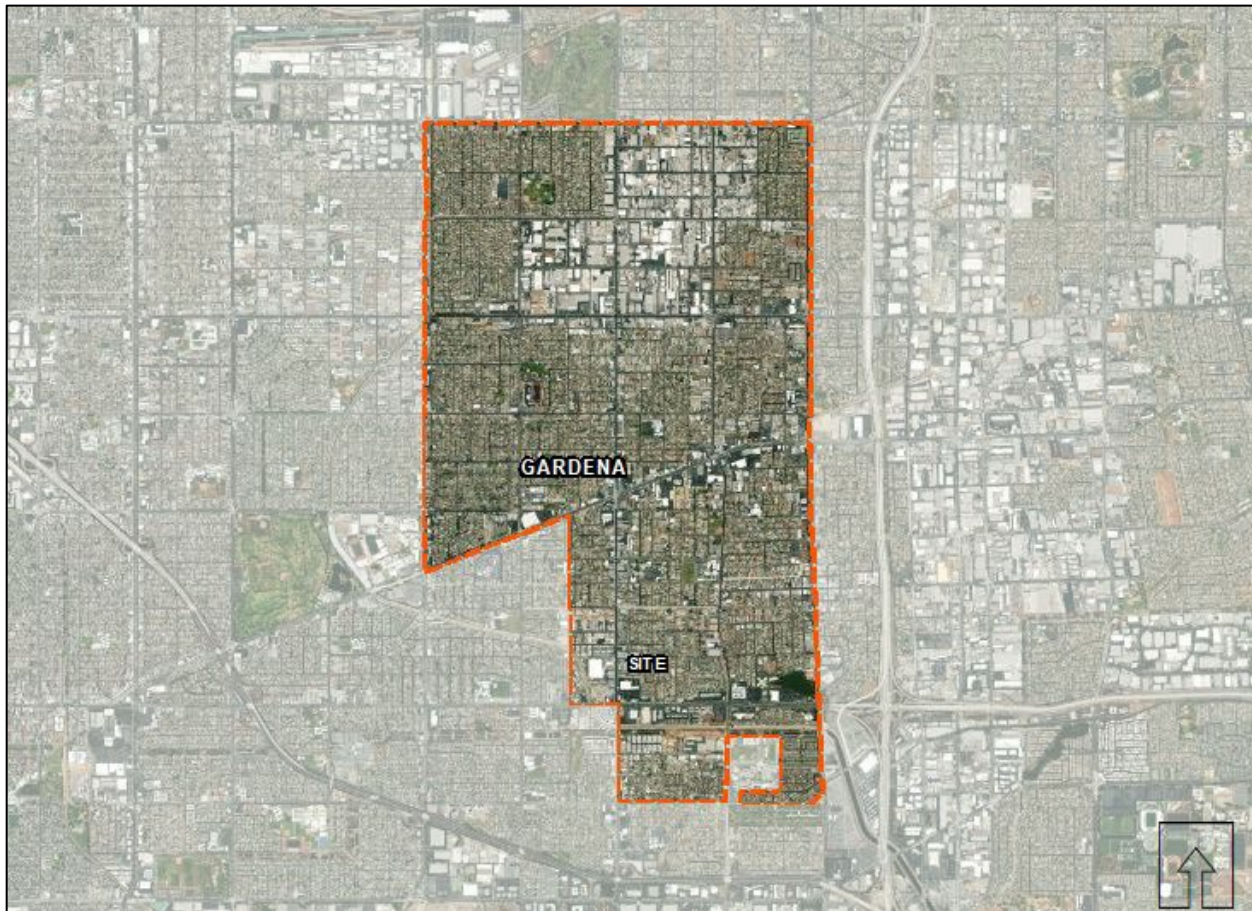


Exhibit 2: Site Vicinity Map

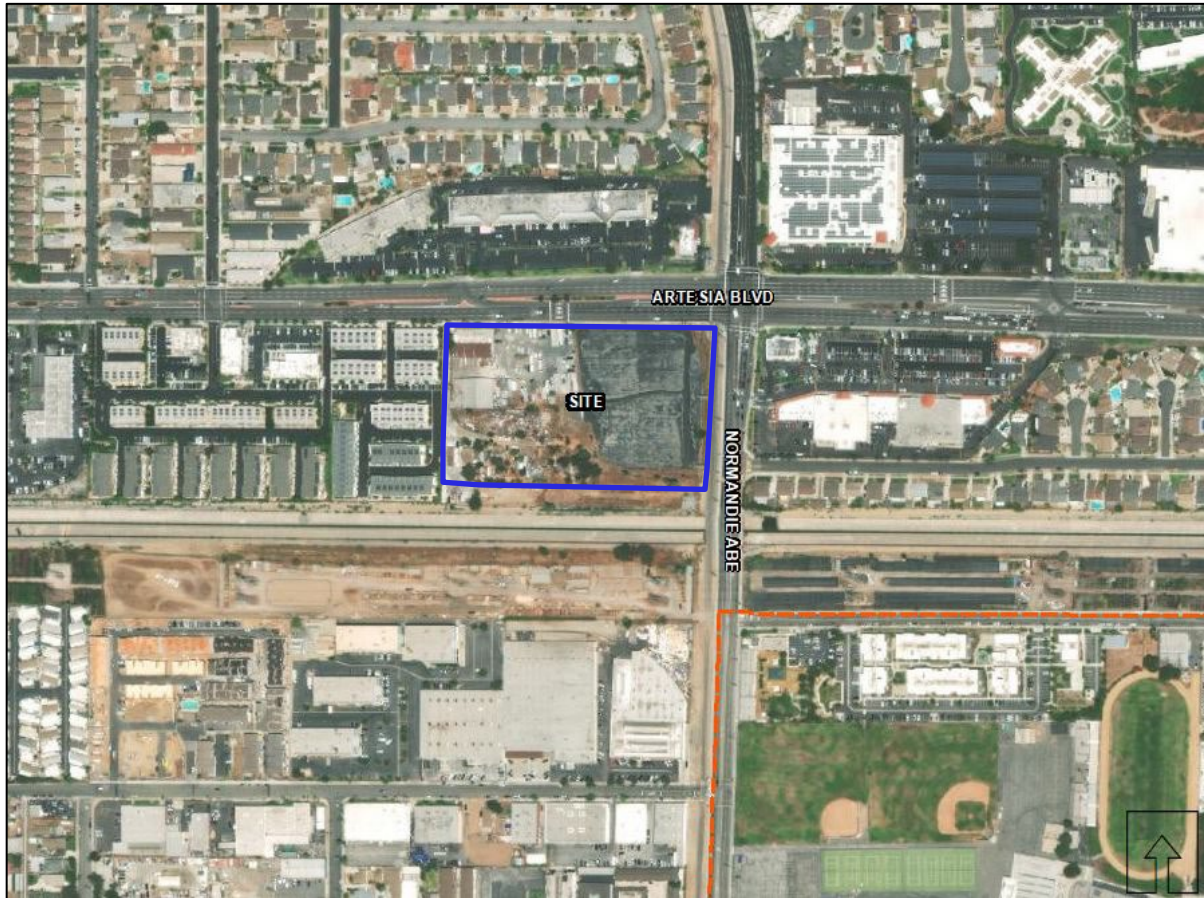
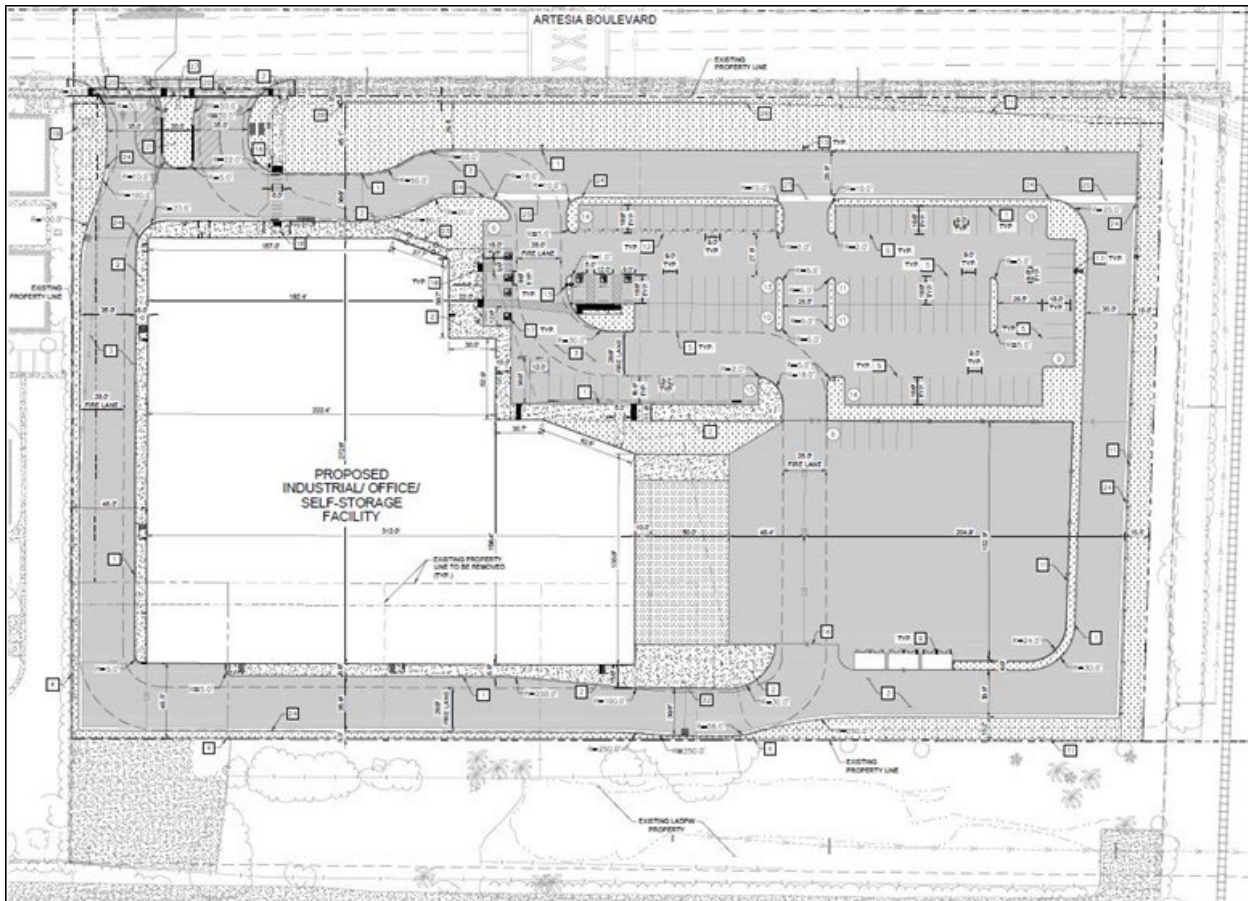


Exhibit 3: Conceptual Site Plan



1.3 Background

The northeastern section of the Project site, the Gardena Sumps, is currently under a cleanup order from the Department of Toxic Substances Control (DTSC) on two parcels (known as the Cooper and Haack properties) associated with oil sludge contamination from three sumps dating from a period of 1938 to 1941. These parcels, which include the Gardena Sumps, will be remediated in accordance with a Remedial Action Plan (RAP) and overseen by DTSC. The following is an excerpt taken from the DTSC EnvironStor website.

The two larger lots have been deemed contaminated due to past uses and in March 1988, the California Department of Health and Safety (DHS) issued a Remedial Action Order to the two property owners, and in July 1988, DHS made an Imminent and/or Substantial Endangerment Determination. This determination required the landowners to fence and secure the site, and remove materials seeping from the sumps to an offsite location. The landowner of the western lot complied and paved the lot, which currently appears to operate commercial services. The landowner of the eastern lot secured and capped the area but failed to remove the hazardous waste from the property.

The Responsible Party, Atlantic Richfield Company, has entered into a consent agreement with DTSC to remediate the site. A Draft Remedial Action Plan (RAP) for the site has been created by Geosyntec Consultants, dated July 1, 2021, for the Atlantic Richfield Company, and is currently under review by DTSC. The RAP investigates several remediation alternatives, and ultimately recommends “capping with selective excavation.”

This relatively in-depth site history is important to the hydrologic and LID analyses as the final site conditions of the remediation activities may serve as the “existing conditions,” or starting condition for the InSite Project. The existing conditions of the site will (1) dictate if stormwater detention is required and/or possible; (2) determine the volume of stormwater to be treated for water quality; and (3) assess BMP mechanism feasibility.

The state of the site at the beginning of the Project construction determines the requirements for stormwater management and water quality treatment. Since the site is currently undergoing remediation and cleanup status is classified as active by DTSC, the ultimate condition of the site (and thus, the site condition at the beginning of the InSite Project), is unknown as of the date of this report. For the hydrologic and LID analyses, it is more conservative to assume the remediation will be complete at the time that the InSite construction activities begin, and thus is the existing conditions for the analysis herein.

For the purposes of this analysis, the term “existing conditions” is defined as the configuration of the site at the complete of the RAP activities and prior to the start of the proposed Project. “Proposed conditions” is defined as the configuration of the site at the completion of the proposed Project.

2. HYDROLOGY

2.1 Introduction

This preliminary hydrology study will determine the amount of stormwater runoff generated from the Project site in the existing and proposed conditions. This study will anticipate whether detention or other peak flow mitigation methods will be required by comparing the proposed and existing condition peak flow rates.

The existing property is 6.28 acres, and the proposed Project aims to acquire adjacent land that will increase the property to 6.44 acres. As such, the proposed property area is considered in this analysis.

2.2 Methodology

The site was analyzed using the Los Angeles County Department of Public Works (LACDPW) Hydrology Manual, dated January 2006 (County Hydrology Manual). The area was analyzed for acreage, land use, soil type, peak flow rate, and time of concentration according to the Rational Method as described in the County Hydrology Manual. The County Hydrology Manual recognizes the LACDWP HydroCalc software as an appropriate tool to calculate peak flow and volume for a full spectrum of storm events. HydroCalc input parameters have been obtained from site survey and from the LACDWP GIS Hydrology Map.

In this preliminary hydrology study, the impervious area percentage values are conservative estimations based on the final condition of the site as described in the RAP and based on the preliminary site design.

According to the County Hydrology Manual, drainage facilities in developed areas must meet a level of protection equivalent to the Urban Flood, defined as the runoff from a 25-year frequency design storm. As site conditions may be considered a sump, additional analysis was performed for the 50-year design storm to assess the Project's affect the Capital Flood conveyance capabilities. The Capital Flood is defined in the County Hydrology Manual as the runoff produced by a 50-year design storm falling on a saturated watershed.

In the case where the proposed conditions peak flow from runoff produced by the 50-year storm event is calculated to exceed the peak flow calculated for the existing conditions, onsite detention will be considered to mitigate the effects of the increased peak flow rate. This detention methodology follows the City of Los Angeles Storm Drain Design Manual and is widely accepted and has been implemented frequently by the Los Angeles County Department of Public Works.

2.3 Existing Drainage Conditions

As the existing conditions topography for the site is undetermined at this time, the site is assumed to be one Drainage Management Area (DMA) having a longest flow path of 500-ft with slope of 2%.

From the RAP Report, Figure 7-1 was digitized in AutoCAD and impervious area values calculated. The impervious areas include pavement, buildings, canopies, and the DTSC proposed geotextile, which extends to the property line to the north and east. The remaining

area of the site is considered pervious. The total impervious and pervious areas are 4.76 acres and 1.68 acres, respectively. Exhibit 1 illustrates the areas of imperviousness and is included in Appendix A.

Storm event rainfall depths and soil type were obtained from the LACDWP GIS Hydrology Map website. Source data is included in Appendix B.

2.4 Proposed Drainage Conditions

The proposed conditions topography for the site is undetermined at this time, and the site is assumed to be one Drainage Management Area (DMA) having a longest flow path of 500-ft with slope of 2%.

A preliminary site plan layout was utilized to calculate the total area of perviousness, including areas of landscape, tree wells, open space/ grass area, etc. Taking the difference from the total site are, the areas of imperviousness and perviousness are 5.68 acres and 0.76 acres, respectively. Exhibit 2 illustrates the areas of imperviousness and is included in Appendix A.

Storm event rainfall depths and soil type were obtained from the LACDWP GIS Hydrology Map website and are the same as in the existing conditions analysis.

2.5 Calculations

As described in the previous sections, the obtained parameters were compiled and inputted into the LACDPW HydroCalc Calculator software for the 50-year storm event. Table 2.1 summarizes the input parameters for the existing and proposed conditions.

Table 2.1 - HydroCalc Input Parameters

Input Parameter	Existing Conditions Value	Proposed Conditions Value
Site Area	6.44 acres	
50-Year Rainfall Depth	5.9 in	
Soil Type	13	
Percent Impervious	74%	88%
Longest Flow Path	500 ft	500 ft
Flow Path Slope	2%	2%

HydroCalc is run for both the existing and proposed conditions for the 50-year storm event with resulting values for peak runoff flow rate and 24-hour clear runoff volume. Table 2.2 summarizes and compares the existing and proposed HydroCalc results for the 50-year storm event. The HydroCalc result printouts are included in Appendix B.

It can be seen in Table 2.1 that all parameters for existing and proposed conditions are the same except for the percent impervious. The peak flow rate parameter is insensitive to imperviousness and produces the same result for both existing and proposed conditions since all other parameters are the same. Alternatively, runoff volume is sensitive to imperviousness and as the imperviousness increases in the proposed conditions, the runoff volume also increases.

Table 2.2 - HydroCalc Results for 50-Year Storm

Output Parameter	Peak Flow Rate	Volume
Existing Condition Result	18.7 cfs	97,584 cu-ft
Proposed Condition Result	18.7 cfs	111,327 cu-ft
Difference (Proposed less Existing)	0 cfs	13,743 cu-ft

These calculations show that the volume of runoff in the proposed condition is greater than in the existing condition, effectively conveying more runoff to the receiving stormwater system. Per the County Hydrology Manual, this scenario would affect the Capital Flood conveyance capabilities and must be addressed.

To maintain the runoff volume produced in the 50-year storm event, the volume difference between the existing conditions and the proposed conditions must be detained onsite to attenuate the amount of runoff leaving the site. The volume to be detained onsite is the difference in volume between the existing and proposed conditions and is approximately 14,000 cu-ft, as shown in Table 2.2.

2.6 Hydrology Conclusions

Changes in flow rate for the 50-year storm event between the existing and proposed conditions is negligible and have no effect on detention requirements. Runoff volume for the 50-year storm event increases in the proposed conditions and approximately 14,000 cu-ft must be detained onsite to attenuate the runoff and mitigate impacts to the surrounding area during the Capital Flood.

Los Angeles County allows for any required detention volume be accounted for in the LID calculations and chosen BMP. As will be discussed the following section, the required LID volume is greater than the detention volume, thus no additional storage above what is required for LID will be necessary for the Project.

3. LOW IMPACT DEVELOPMENT (LID)

3.1 LID Calculation

Per the Los Angeles County (LAC) Department of Public Works (DPW) Low Impact Development (LID) Manual, a specific volume of stormwater runoff is required to be treated for water quality. This volume is called the stormwater quality design volume, and it is expected that by treating this volume, pollutant loads will be reduced in the discharge to or prevented from reaching the receiving waters. The stormwater quality design volume for the proposed peak mitigated flows and volumes have been calculated using the Los Angeles County (LAC) HydroCalc Calculator.

The LID Manual prescribes that the mitigated peak flow and volume are based on the 85th Percentile of rainfall or $\frac{3}{4}$ -in rainfall, whichever is greater. According to the LAC Hydrology GIS Map, the 85th Percentile rainfall is 0.9-in and will be used for the calculations. HydroCalc Calculator input parameters have been compiled from the LAC Hydrology GIS Map and the proposed site layout and grading. HydroCalc Calculator result printouts, including input parameters, and data sources, are included in Appendix B.

As described in the previous sections, the proposed Project has a tributary area of 6.44 acres which comprised of 5.68 acres of impervious area, and 0.76 acre of pervious area. The HydroCalc Calculator is run using the same input parameters as for the 50-year storm event, described in the Hydrology Section, but using the 85th percentile storm event rainfall depth. HydroCalc Calculator results produces a peak runoff rate of 1.3 cfs and required mitigated volume of 16,800 cu-ft, as shown in Table 3.1. Detailed calculation summary tables are included in Appendix C.

Table 3.1 - HydroCalc Results for the 85th Percentile Storm Event

	Peak Flow Rate	Required Mitigated Volume
Proposed Condition	1.3 cfs	16,800 cu-ft

3.2 BMP Feasibility Analysis

While the first priority BMP preferred by LAC DWP is infiltration, because of the prior use of the site/the history of the site and remediation activities, infiltrating stormwater into the ground has a high potential of transporting contamination to the groundwater. As such, an infiltration BMP is considered not feasible for this Project.

The second priority BMP as listed in the LID Manual, is harvest and use, also called capture and use. This retention BMP typically consists of an underground cistern for storage with a pretreatment mechanism to remove debris, and potentially a post-treat mechanism, depending on the ultimate use of the water. The cistern stores the runoff to be used elsewhere onsite. The most common onsite use is landscape irrigation, which typically does not require post-treatment. Other potential uses include vehicle washing, AC unit cooling, toilet flushing, and others; however, these may require additional post-treatment for increased water quality. Cistern sizing must also be coordinated with the landscape architect to ensure that the proposed landscape area and plant palette can use the full volume of stormwater stored in the

3.3 Source Control Measures

Source control BMPs include permanent, structural features, such as roofs over and berms around trash and recycling areas, and Operational BMPs, such as regular sweeping and “housekeeping”, that must be implemented by the site’s occupant or user. Per the Source Control Measures Selections Matrix (Table 5-1) of the LID Manual, the following discussion identifies the source control measures to be implemented due to the proposed uses at the site.

- **Storm Drain Message and Signage (S-1)** Storm Drain Signage will be provided on all proposed onsite catch basins to discourage the public from discarding pollutants to the storm drain system and potentially obstructing the proposed BMP treatment facility. The placard or stencil will indicate the ultimate destination of the runoff entering the device. This stencil shall be weatherproof and visible at all times.
- **Outdoor Trash Storage and Waste Handling Area (S-3)** Surfacing, screens/covers, grading and drainage, and signs may be designed to mitigate the transport of loose trash and debris by wind or water into nearby storm drain inlets, channels, and/or receiving waters. Trash enclosures will include walls to prevent wind dispersion of trash and debris.
- **Outdoor Loading / Unloading Dock Area (S-4)** Outdoor loading/ unloading docks will be made of concrete or equivalent impervious surface. The area will be covered to help prevent stormwater runoff conveyance in the dock area. The area will be hydraulically isolated, and any accumulated runoff will be collected and treated appropriately (i.e., sediment/oil/water separator.)
- **Landscape Irrigation Practices (S-8)** As part of the design of all common area landscape irrigation shall employ water conservation principals, including, but not limited to, such provisions as water sensors, programmable irrigation times (for short cycles), etc., will be used.
- **Building Materials Selection (S-9)** Material selection will minimize the use of copper, galvanized metals and other materials that could add significant amounts of harmful pollutants to stormwater runoff.

3.4 Stormwater Quality Control Measures

Stormwater quality control BMPs include several mechanisms that aim to meet stormwater runoff requirements in terms of onsite retention and pollutant removal. These BMPs must be designed to handle the Stormwater Quality Design Volume and provide mechanism to divert overflow around the stormwater quality control measures to prevent overloading.

The categories of stormwater quality BMPs include retention-based, vegetation-based, and treatment-based. As discussed in a previous section, the biofiltration BMP and the retention-based BMP capture and use has been chosen for the Project.

- **Rain Barrel / Cistern (RET-6)** Stormwater storage and water quality pretreatment will be provided to attenuate stormwater runoff for the design storm to be later utilized to irrigate onsite landscape.

3.5 LID Conclusion

As per the County LID Manual requires, stormwater quality measures have been assessed, pollutant source control measures identified, and a retention-based BMP has been chosen and sized as prescribed in the County LID Manual.

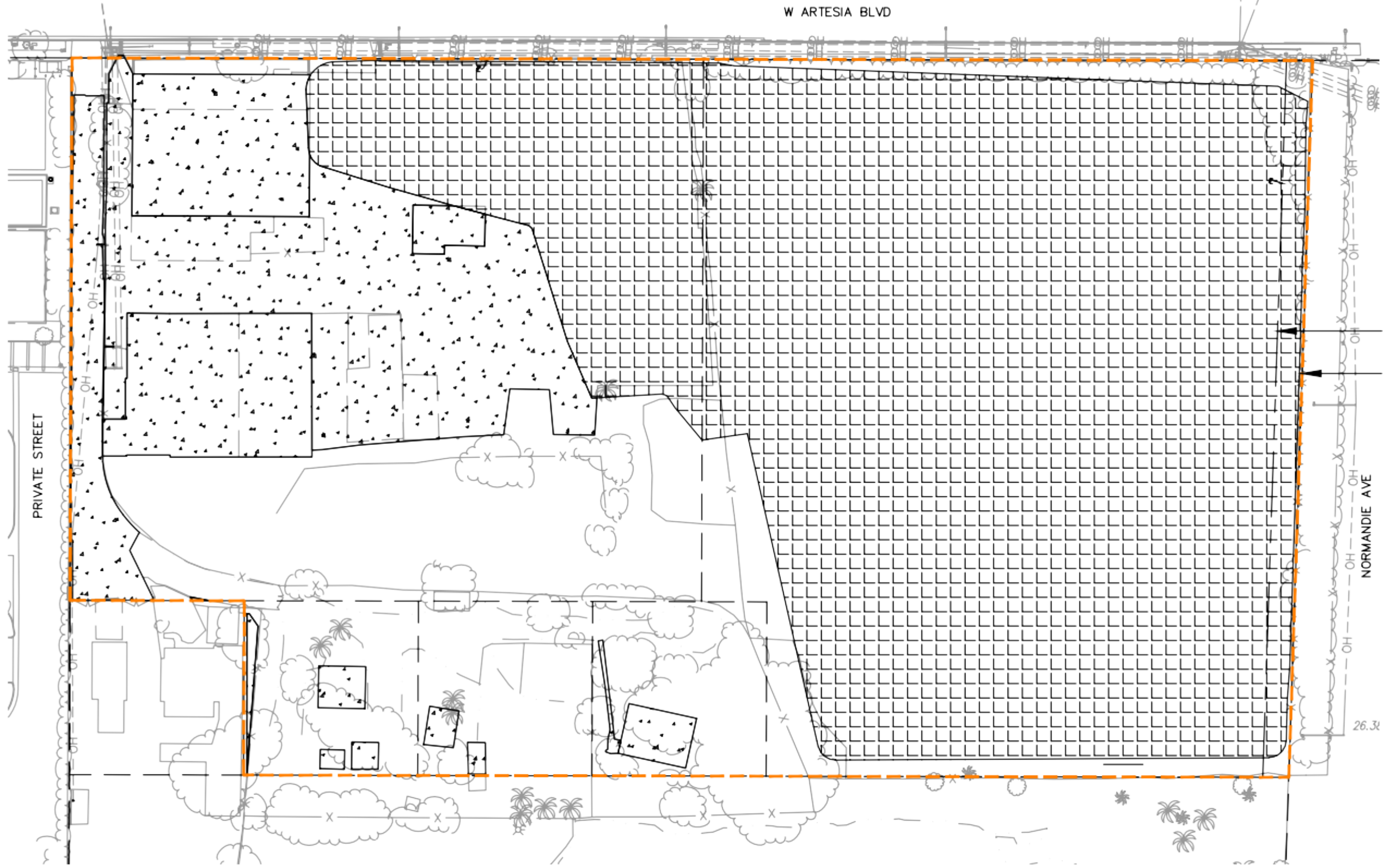
The Stormwater Quality Design Volume calculation herein, prescribes that approximately 16,800 cu-ft of stormwater runoff must be treated and retained onsite to meet the County LID requirements. A large onsite cistern will provide storage for the required volume and onsite landscape will be irrigated with the stored stormwater.

As previously mentioned, the hydrology calculations have shown that approximately 14,000 cu- ft must be detained onsite to attenuate stormwater runoff during the Capital Flood. Since the County allows for LID storage to also count as required detention, no additional storage above what is required for LID is necessary for the Project.

APPENDIX A

Impervious/ Pervious Exhibits for Existing Conditions and Proposed Conditions

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- LEGEND**
- PROPERTY LINE
 - LOT LINE
 - - - - - PROJECT AREA
 - PAVEMENT, BUILDINGS, CANOPIES (IMPERVIOUS)
 - POST-REMEDIAION GEOTEXTILE COVERING (IMPERVIOUS)

--- EXISTING PROPERTY LINE
 --- PROPOSED PROPERTY LINE

SITE AREA = 6.44 AC
 IMPERVIOUS AREA = 4.76 AC
 PERVIOUS AREA = 1.68 AC

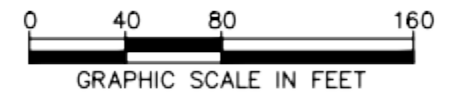


EXHIBIT 1 - EXISTING CONDITIONS (POST-REMEDIAION)

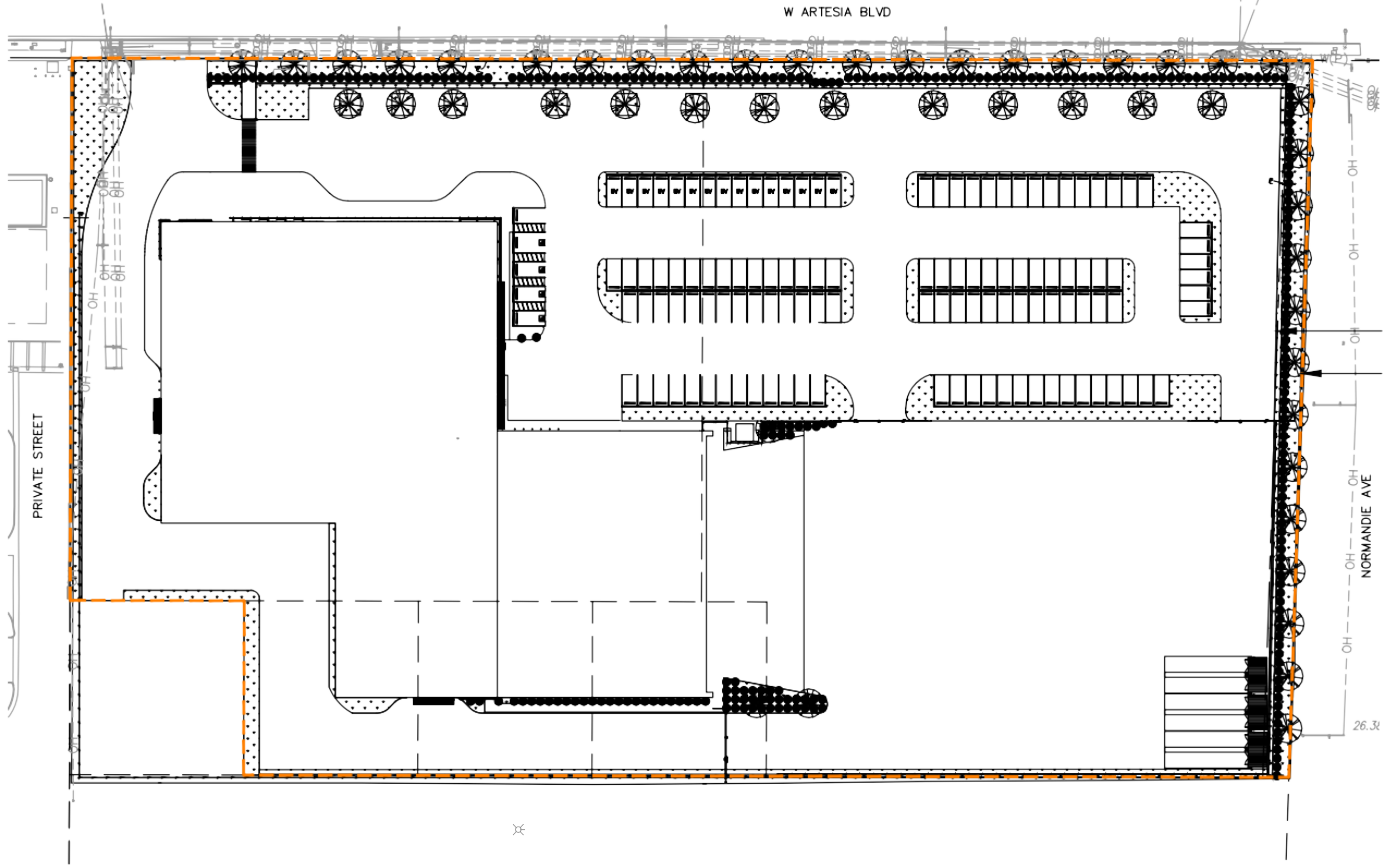
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1450 W ARTESIA BLVD, GARDENA CA

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LEGEND

- PROPERTY LINE
- LOT LINE
- PROJECT AREA
- ▒ PROPOSED LANDSCAPE, GRASS, TREE WELLS (PERVIOUS)

EXISTING PROPERTY LINE
 PROPOSED PROPERTY LINE

SITE AREA = 6.44 AC
 IMPERVIOUS AREA = 5.68 AC
 PERVIOUS AREA = 0.76 AC

NORTH

0 40 80 160
 GRAPHIC SCALE IN FEET

EXHIBIT 2 - PROPOSED CONDITIONS

Kimley»Horn

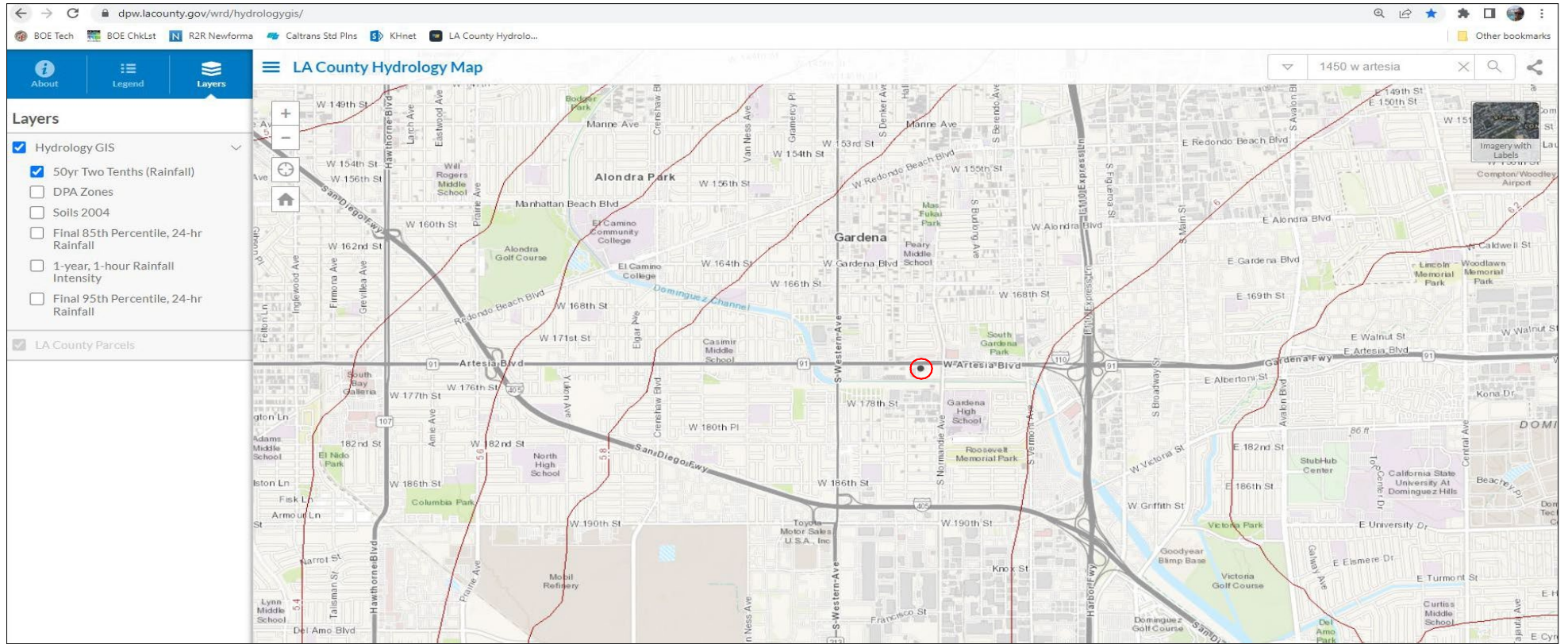
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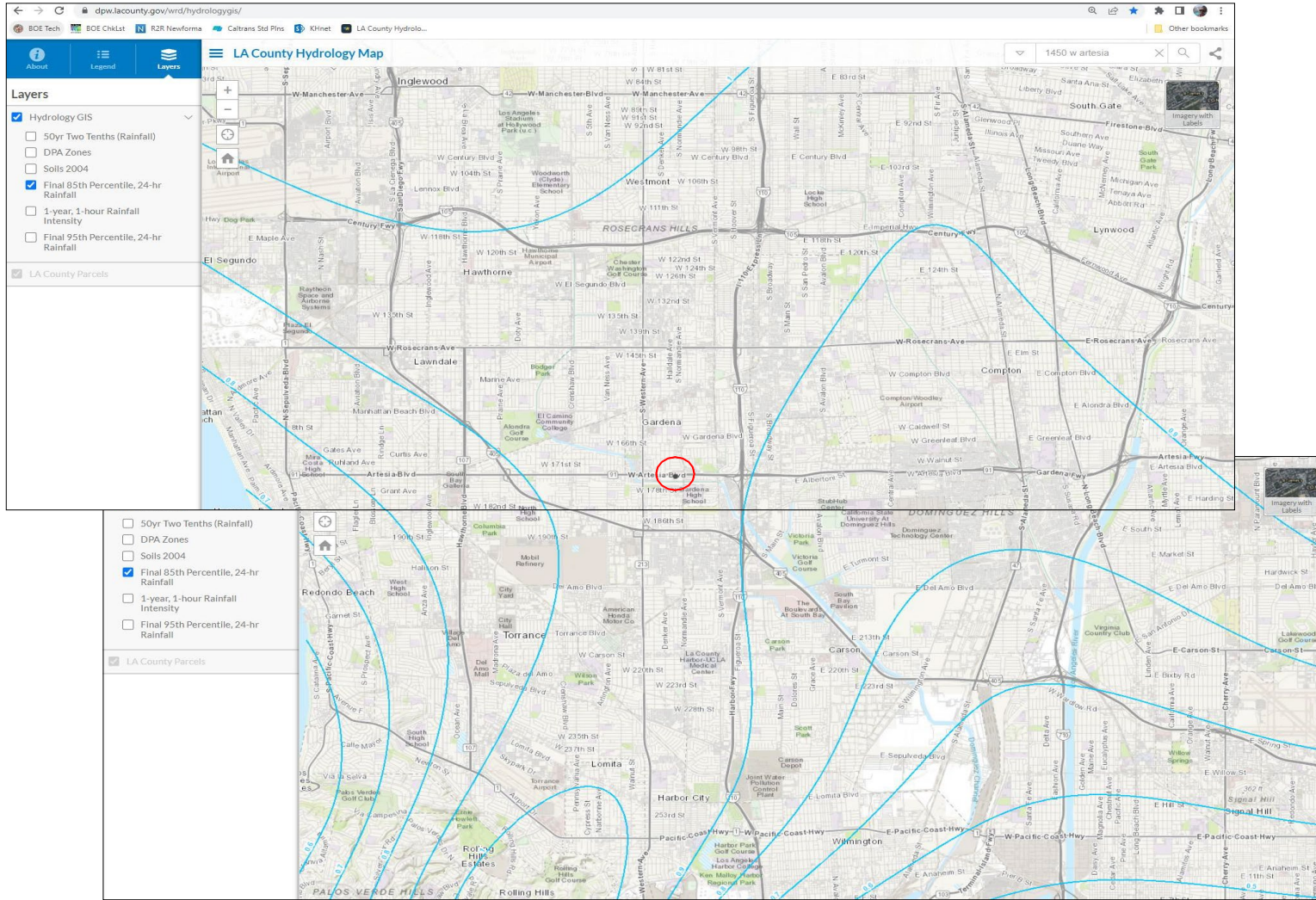
APPENDIX B

HydroCalc Input Parameters and Result Printouts

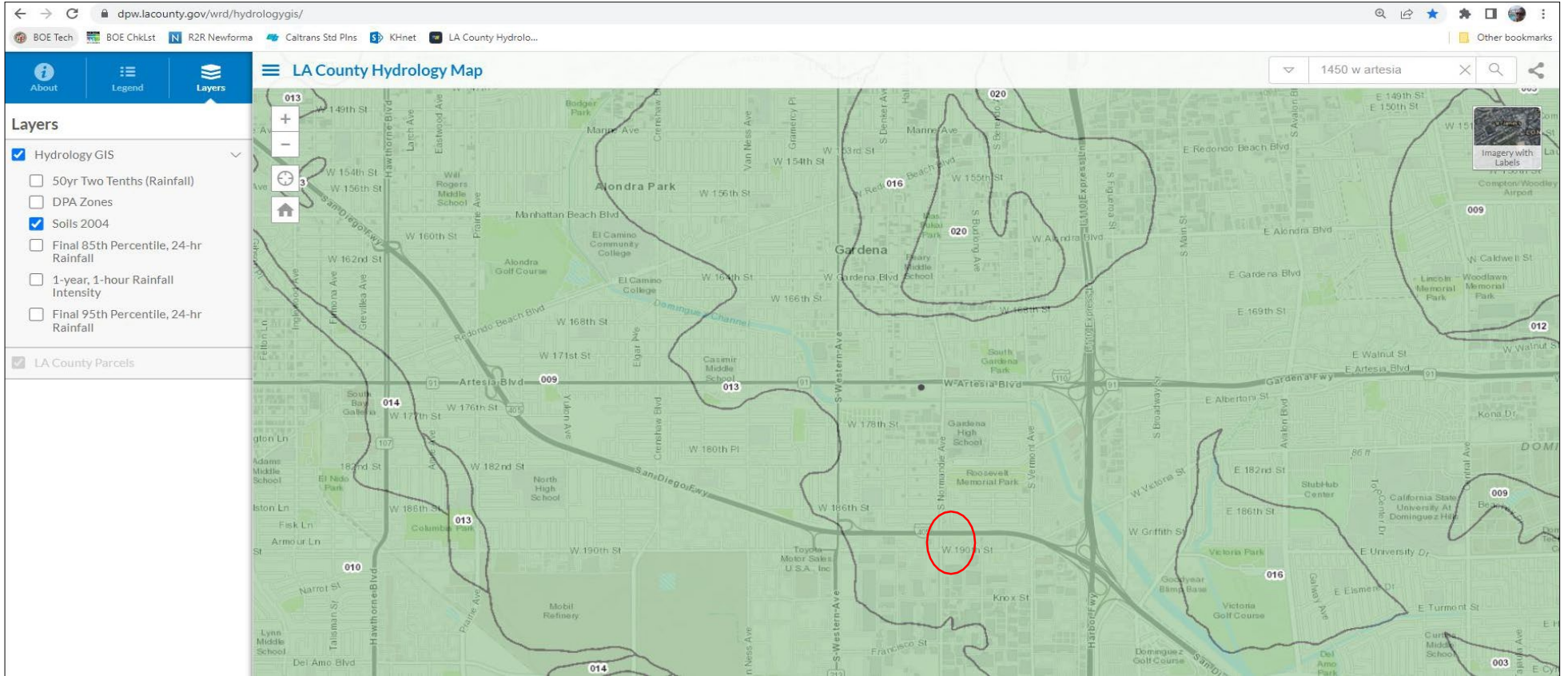


85th Percentile

0.9 in



Soil Number = 013



Peak Flow Hydrologic Analysis

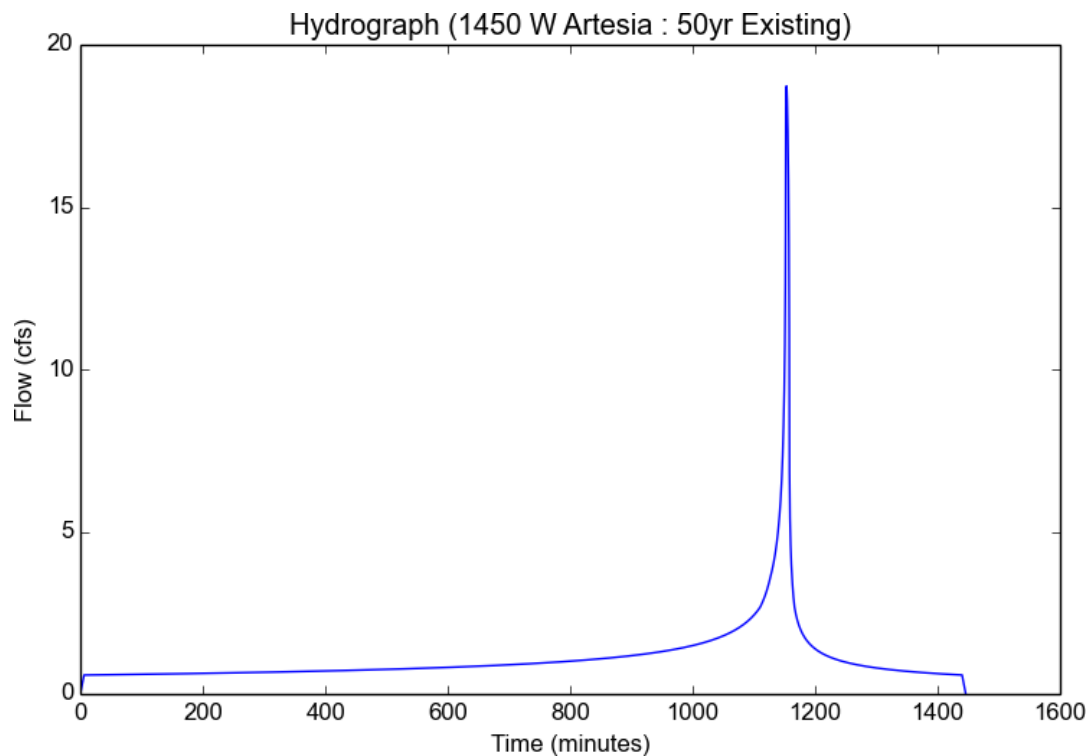
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	1450 W Artesia
Subarea ID	50yr Existing
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.74
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.231
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	18.727
Burned Peak Flow Rate (cfs)	18.727
24-Hr Clear Runoff Volume (ac-ft)	2.2402
24-Hr Clear Runoff Volume (cu-ft)	97583.7099



Peak Flow Hydrologic Analysis

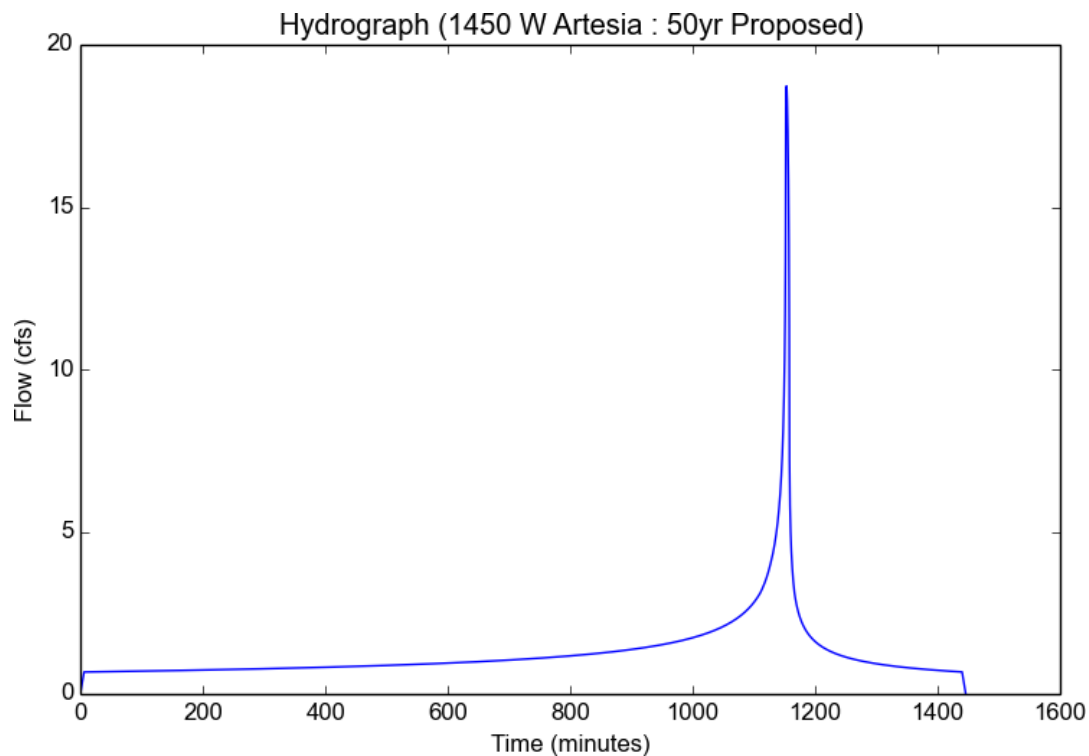
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	1450 W Artesia
Subarea ID	50yr Proposed
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.88
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.231
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	18.727
Burned Peak Flow Rate (cfs)	18.727
24-Hr Clear Runoff Volume (ac-ft)	2.5557
24-Hr Clear Runoff Volume (cu-ft)	111327.0714



Peak Flow Hydrologic Analysis

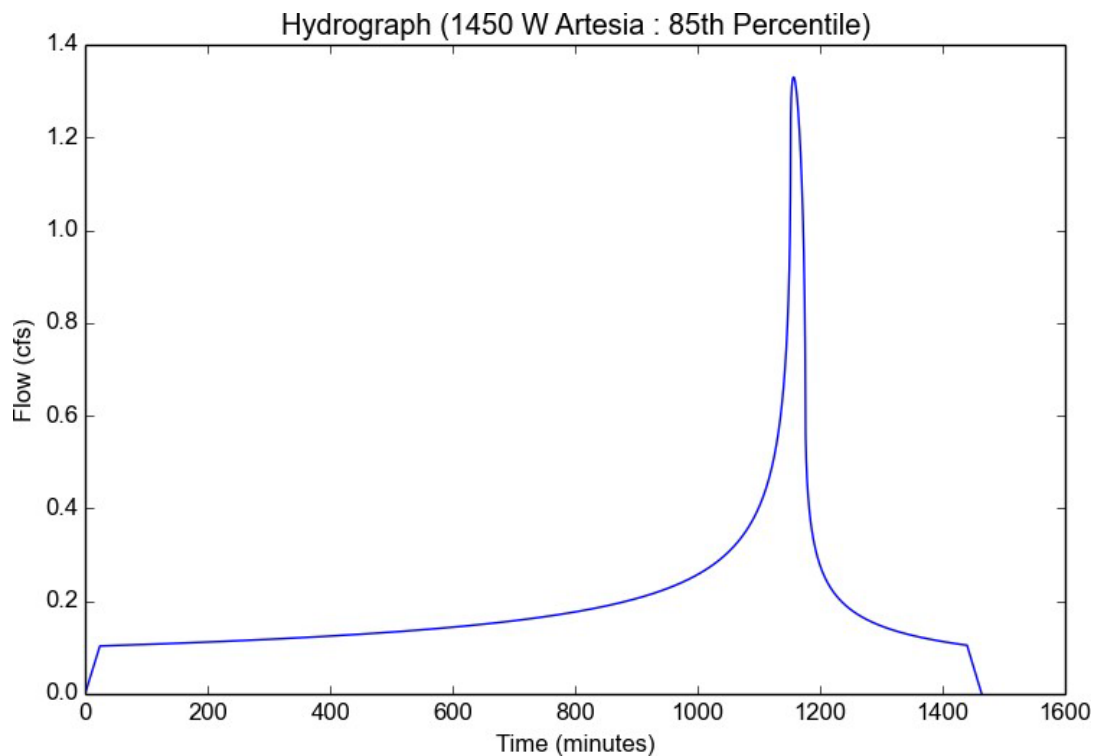
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	1450 W Artesia
Subarea ID	85th Percentile
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	0.9
Percent Impervious	0.88
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.9
Peak Intensity (in/hr)	0.2569
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.804
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	1.3302
Burned Peak Flow Rate (cfs)	1.3302
24-Hr Clear Runoff Volume (ac-ft)	0.3851
24-Hr Clear Runoff Volume (cu-ft)	16776.0652



APPENDIX C

Calculation Summary Table

Hydrology and LID Calculations

Updated: 8/2/2022

	sf	ac
Proposed P/L Area =	280,402	6.44
Existing P/L Area =	273,618	6.28

Rainfall Depth (in)		Rainfall Depth (in)	
85th %-ile	0.9	50-yr	5.9

DETENTION

EXISTING CONDITIONS (Pre)

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length ft	Slope ft/ft	Soil Type #	50-Year Storm	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q50 (cfs)	V50 (cf)
Site		280,402	6.44	207,323	4.76	74%	73,079	1.68	26%	500	0.020	13	18.7	97,584
Total		280,402	6.44	207,323	4.76	74%	73,079	1.68	26%				18.7	97,584

PROPOSED CONDITIONS (Post)

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length ft	Slope ft/ft	Soil Type #	50-Year Storm	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q50 (cfs)	V50 (cf)
Site		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%	500	0.020	13	18.7	111,327
Total		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%				18.7	111,327

Post less Pre = 0 13,743

Required Detention = 13,743 cf

LID

PROPOSED CONDITIONS

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length ft	Slope ft/ft	Soil Type #	85th Percentile	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q85th	V85th
Site		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%	500	0.020	13	1.3	16,776
Total		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%				1.3	16,776

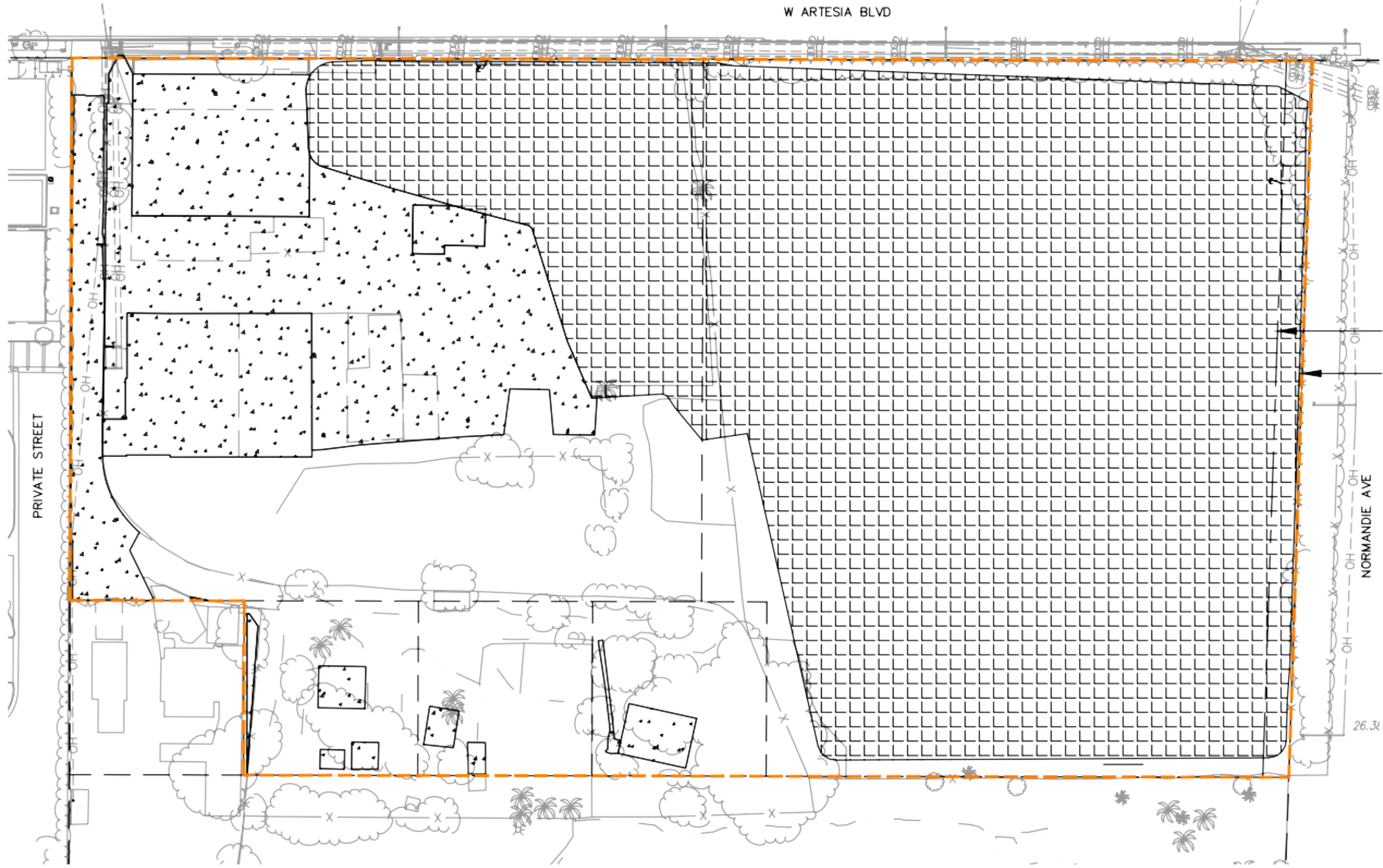
Required LID = 16,776 cf

TOTAL REQUIRED VOLUME STORED = 16,776 cf
125,485 gal

APPENDIX A

Impervious/ Pervious Exhibits for Existing Conditions and Proposed Conditions

K:\BAY_LDEV\197425001 - Inalte - Gardena Industrial - BZH\03 CADD\Exhibits\HH and LID Exhibits\Exh - 1450 Artesia HH Exstdwg B/2/2022 10:57 AM



- LEGEND**
- PROPERTY LINE
 - LOT LINE
 - - - - - PROJECT AREA

- PAVEMENT, BUILDINGS, CANOPIES (IMPERVIOUS)
- POST-REMEDATION GEOTEXTILE COVERING (IMPERVIOUS)

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE

SITE AREA = 6.44 AC
 IMPERVIOUS AREA = 4.76 AC
 PERVIOUS AREA = 1.68 AC

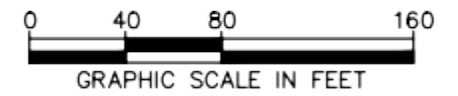


EXHIBIT 1 - EXISTING CONDITIONS (POST-REMEDICATION)

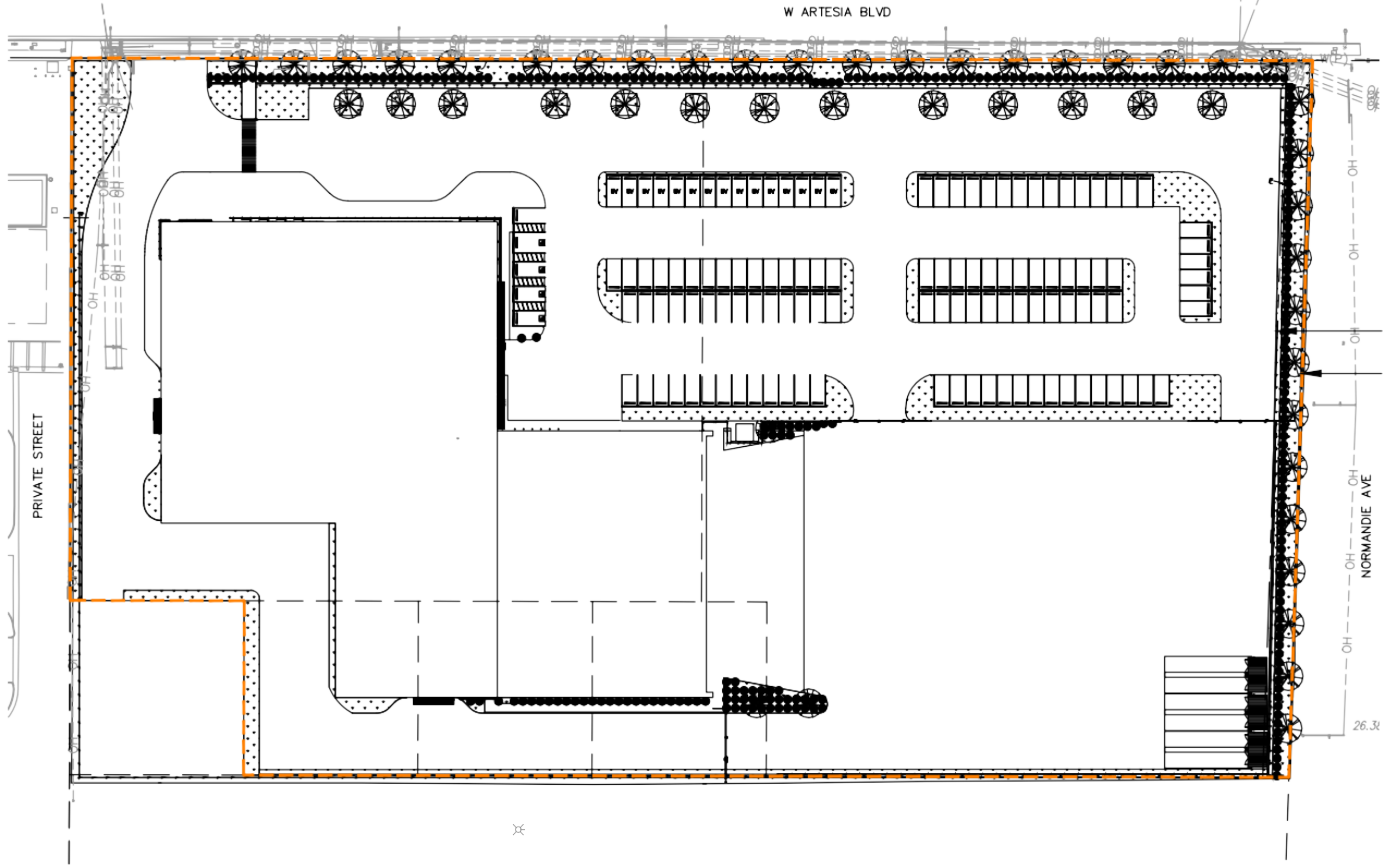
Kimley»Horn

2022 KIMLEY-HORN AND ASSOCIATES, INC.
 660 S. FIGUEROA ST, SUITE 2050, LOS ANGELES, CA 9001
 PHONE: 213-261-4040

1450 W ARTESIA BLVD, GARDENA CA

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K:\BAY_DEV\197425001 - Inalte - Gardena Industrial - BZH\03 CADD\Exhibits\HH and LID Exhibits\Exh - 1450 Artesia HH Prop.dwg 8/2/2022 3:17 PM



- LEGEND
- PROPERTY LINE
 - LOT LINE
 - - - PROJECT AREA
 - [Stippled Box] PROPOSED LANDSCAPE, GRASS, TREE WELLS (PERVIOUS)

EXISTING PROPERTY LINE
 PROPOSED PROPERTY LINE

SITE AREA = 6.44 AC
 IMPERVIOUS AREA = 5.68 AC
 PERVIOUS AREA = 0.76 AC

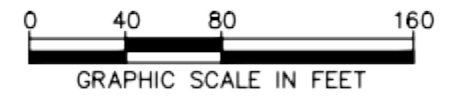
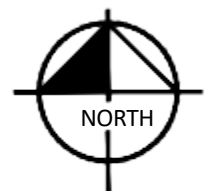


EXHIBIT 2 - PROPOSED CONDITIONS

Kimley»Horn

2022 KIMLEY-HORN AND ASSOCIATES, INC.
 660 S. FIGUEROA ST, SUITE 2050, LOS ANGELES, CA 9001
 PHONE: 213-261-4040

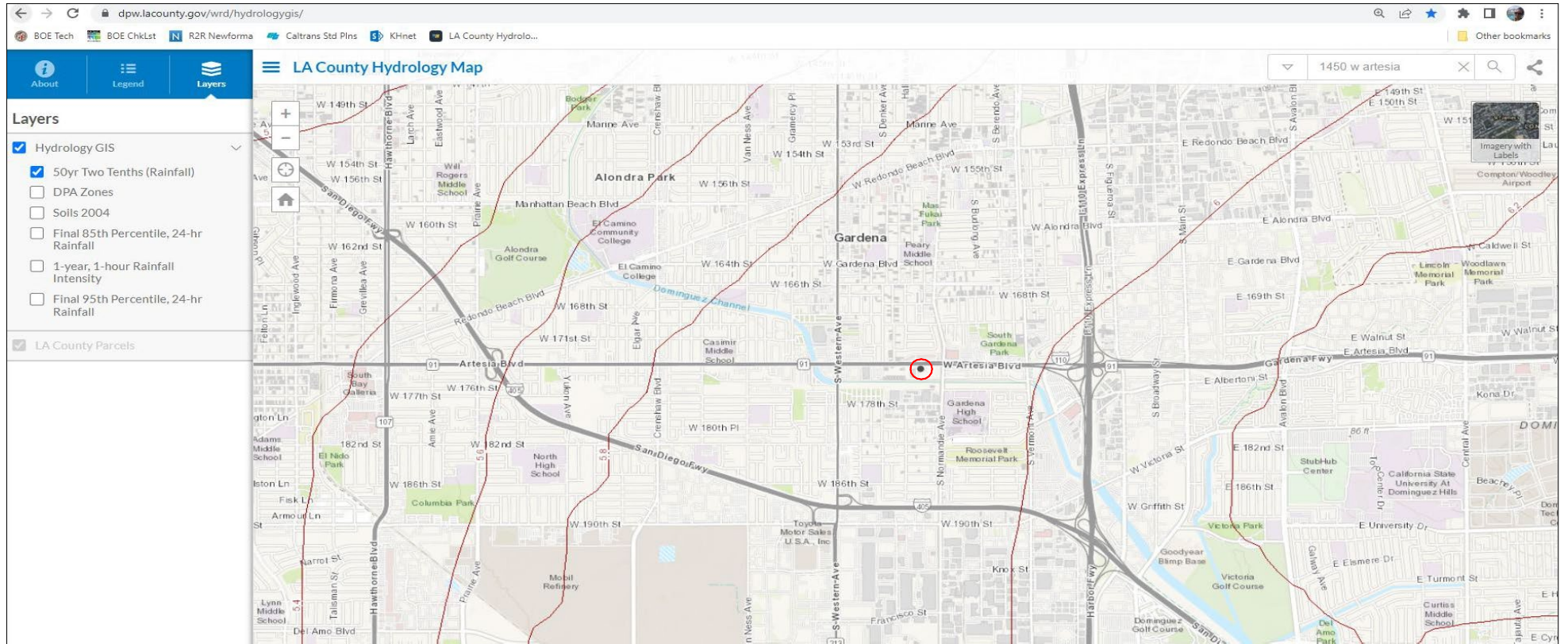
1450 W ARTESIA BLVD, GARDENA CA

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APPENDIX B

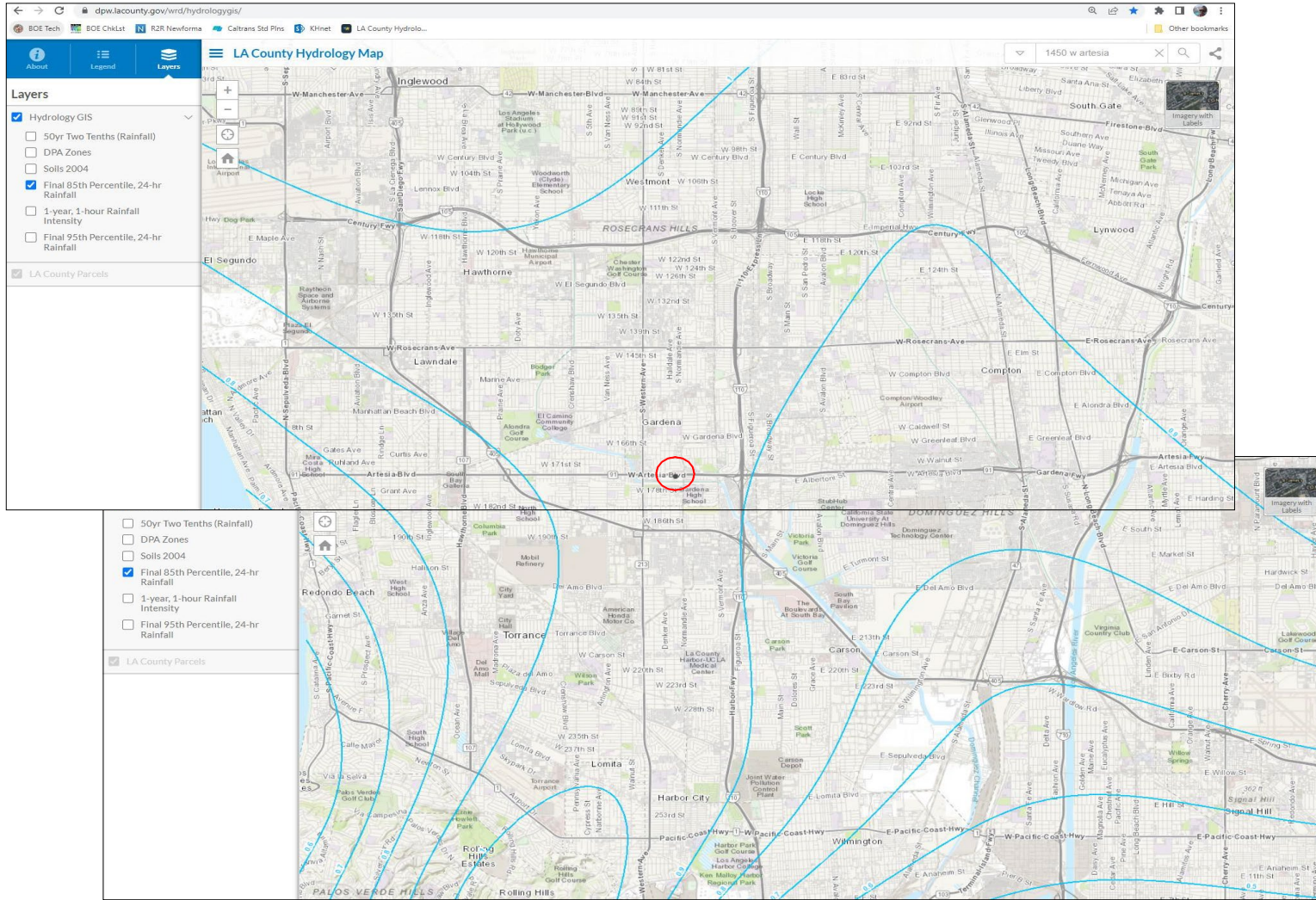
HydroCalc Input Parameters and Result Printouts

50-Year 5.9 in

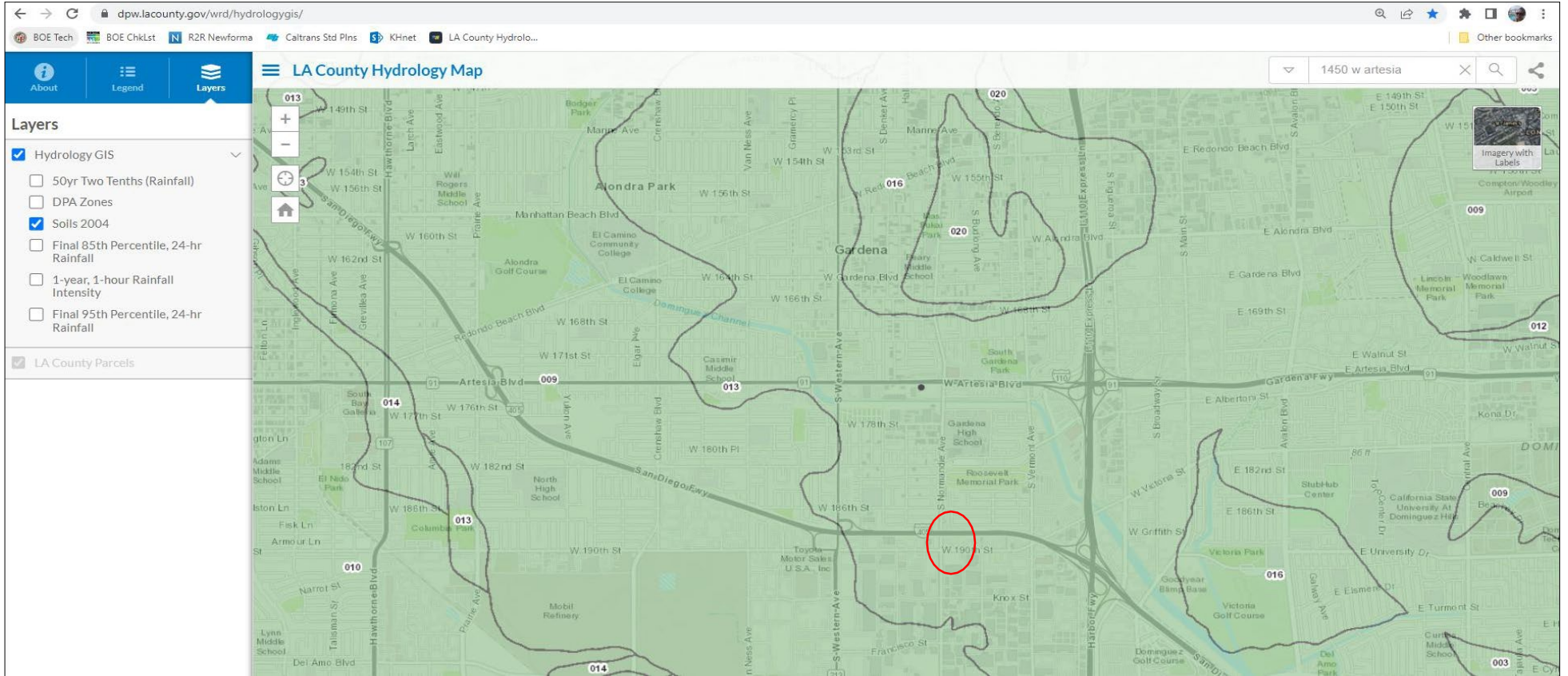


85th Percentile

0.9 in



Soil Number = 013



Peak Flow Hydrologic Analysis

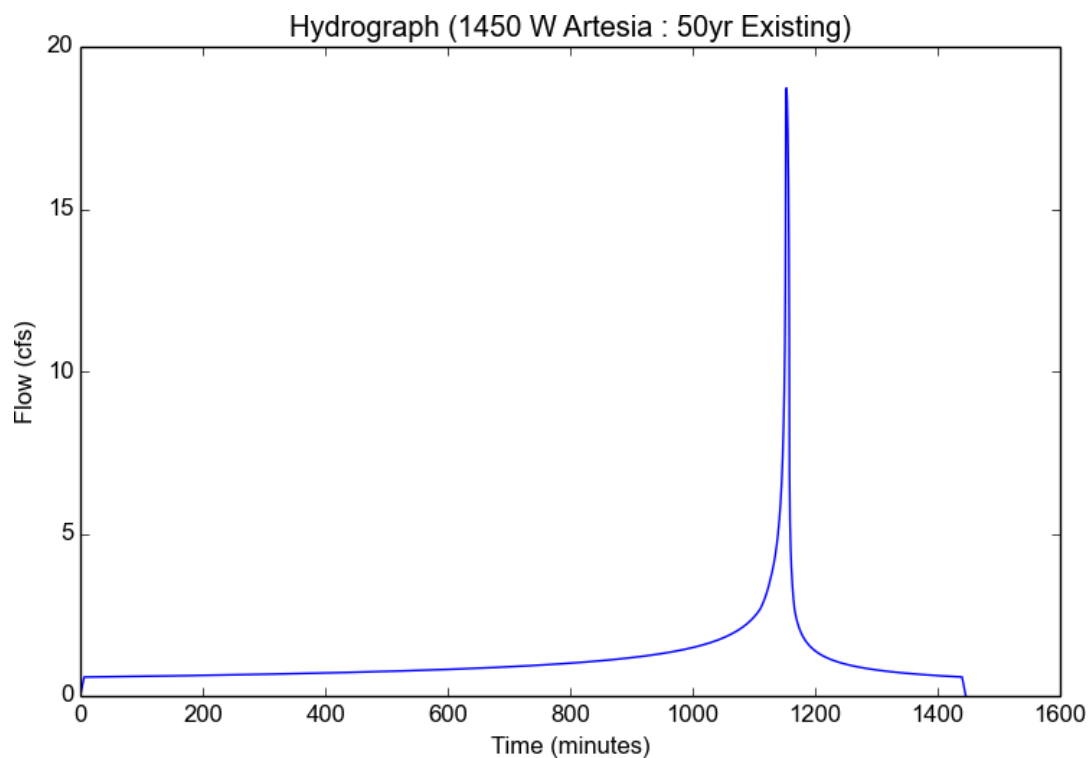
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	1450 W Artesia
Subarea ID	50yr Existing
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.74
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.231
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	18.727
Burned Peak Flow Rate (cfs)	18.727
24-Hr Clear Runoff Volume (ac-ft)	2.2402
24-Hr Clear Runoff Volume (cu-ft)	97583.7099



Peak Flow Hydrologic Analysis

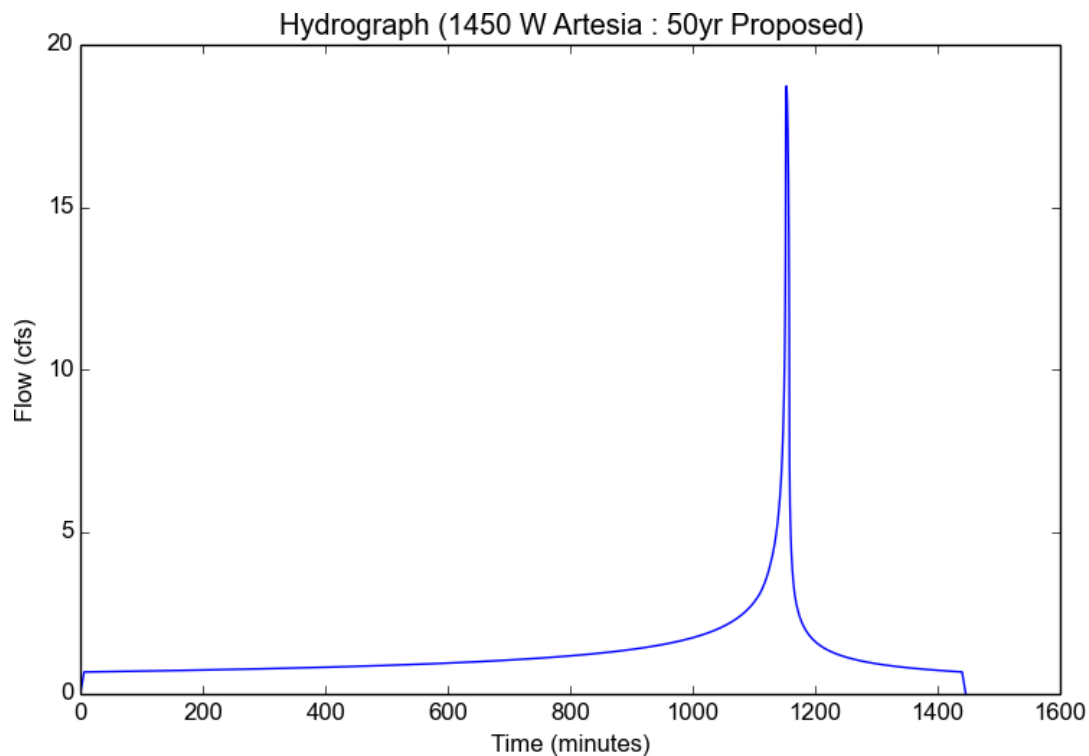
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	1450 W Artesia
Subarea ID	50yr Proposed
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.88
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.231
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	18.727
Burned Peak Flow Rate (cfs)	18.727
24-Hr Clear Runoff Volume (ac-ft)	2.5557
24-Hr Clear Runoff Volume (cu-ft)	111327.0714



Peak Flow Hydrologic Analysis

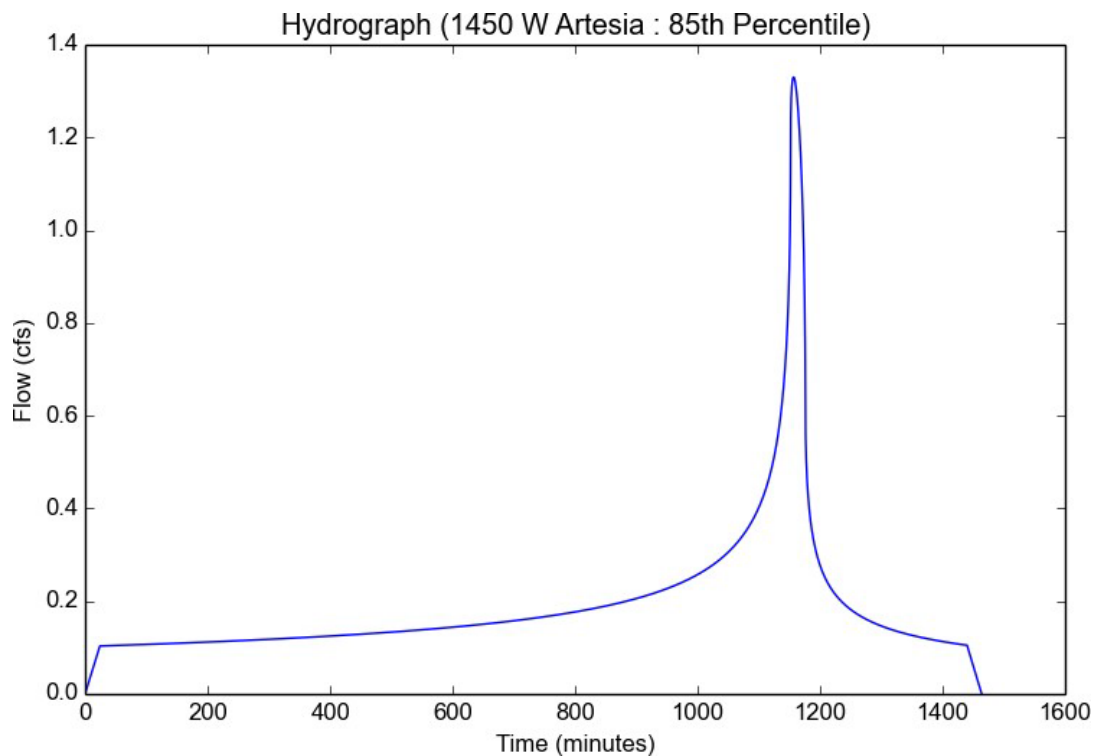
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	1450 W Artesia
Subarea ID	85th Percentile
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	0.9
Percent Impervious	0.88
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.9
Peak Intensity (in/hr)	0.2569
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.804
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	1.3302
Burned Peak Flow Rate (cfs)	1.3302
24-Hr Clear Runoff Volume (ac-ft)	0.3851
24-Hr Clear Runoff Volume (cu-ft)	16776.0652



APPENDIX C

Calculation Summary Table

Hydrology and LID Calculations

Updated: 8/2/2022

	sf	ac
Proposed P/L Area =	280,402	6.44
Existing P/L Area =	273,618	6.28

Rainfall Depth (in)		Rainfall Depth (in)	
85th %-ile	0.9	50-yr	5.9

DETENTION

EXISTING CONDITIONS (Pre)

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length ft	Slope ft/ft	Soil Type #	50-Year Storm	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q50 (cfs)	V50 (cf)
Site		280,402	6.44	207,323	4.76	74%	73,079	1.68	26%	500	0.020	13	18.7	97,584
Total		280,402	6.44	207,323	4.76	74%	73,079	1.68	26%				18.7	97,584

PROPOSED CONDITIONS (Post)

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length ft	Slope ft/ft	Soil Type #	50-Year Storm	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q50 (cfs)	V50 (cf)
Site		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%	500	0.020	13	18.7	111,327
Total		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%				18.7	111,327

Post less Pre = 0 13,743

Required Detention = 13,743 cf

LID

PROPOSED CONDITIONS

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length ft	Slope ft/ft	Soil Type #	85th Percentile	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q85th	V85th
Site		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%	500	0.020	13	1.3	16,776
Total		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%				1.3	16,776

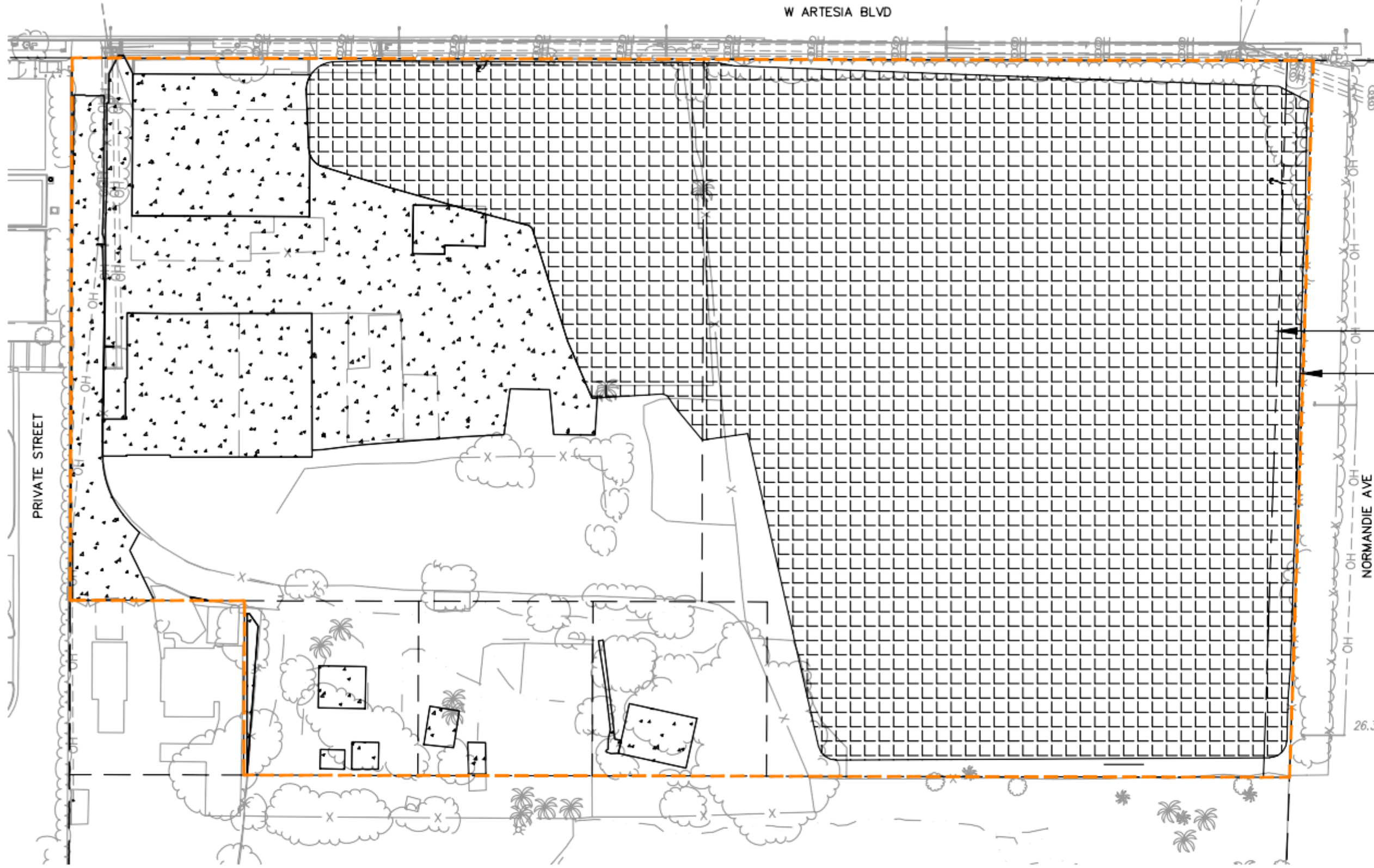
Required LID = 16,776 cf

TOTAL REQUIRED VOLUME STORED = 16,776 cf 125,485 gal

APPENDIX A

Impervious/ Pervious Exhibits for Existing Conditions and Proposed Conditions

K:\BAY_LDEV\197425001 - Inalte - Cardena Industrial - BZH\03 CADD\Exhibits\HH and LID Exhibits\Exh - 1450 Artesia HH Exst.dwg 8/2/2022 10:57 AM



- LEGEND**
- PROPERTY LINE
 - LOT LINE
 - - - PROJECT AREA

- PAVEMENT, BUILDINGS, CANOPIES (IMPERVIOUS)
- POST-REMEDIAION GEOTEXTILE COVERING (IMPERVIOUS)

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE

SITE AREA = 6.44 AC
 IMPERVIOUS AREA = 4.76 AC
 PERVIOUS AREA = 1.68 AC

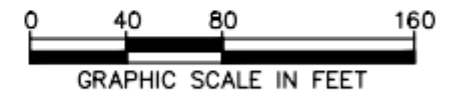


EXHIBIT 1 - EXISTING CONDITIONS (POST-REMEDIAION)

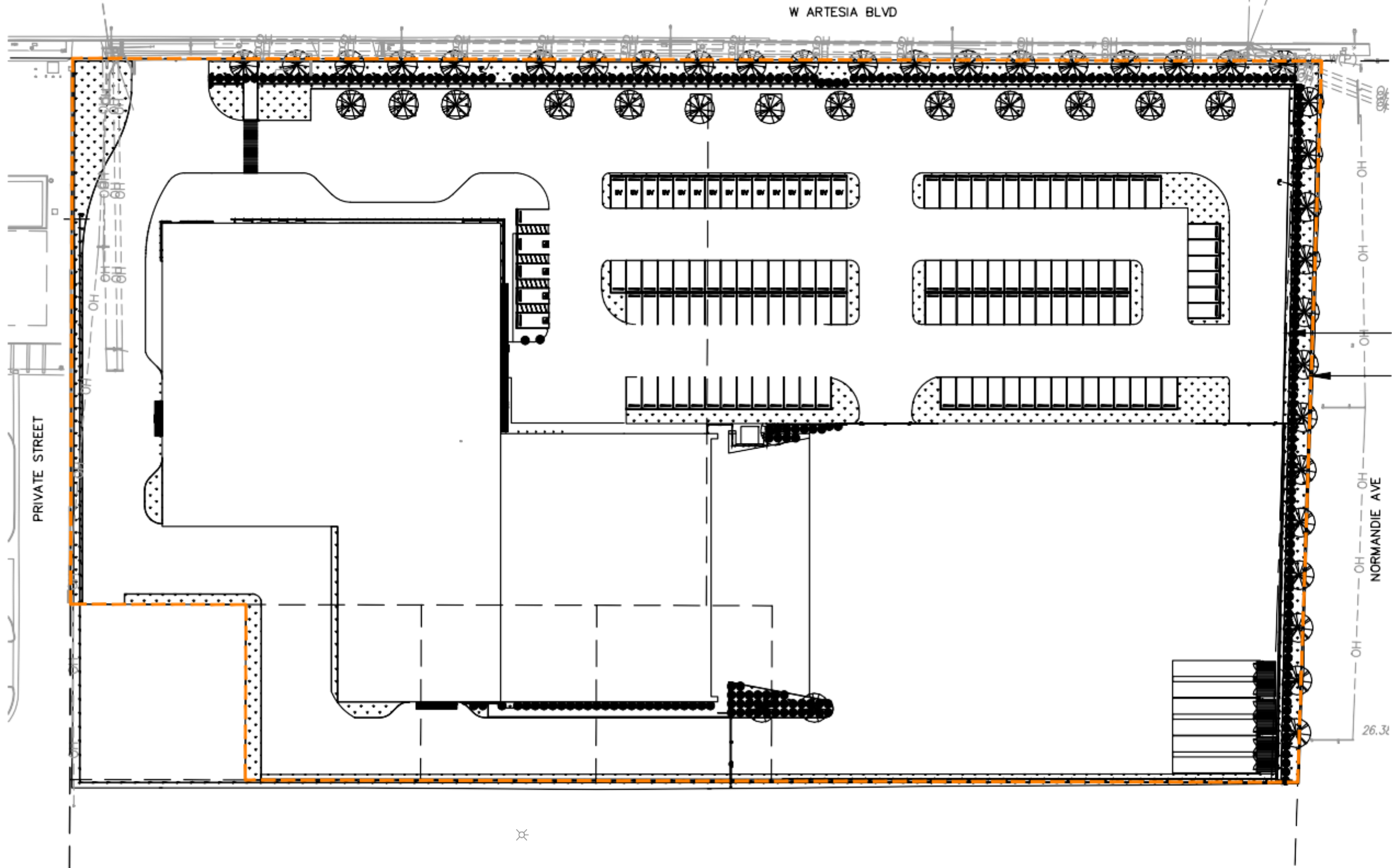
Kimley»Horn

2022 KIMLEY-HORN AND ASSOCIATES, INC.
 660 S. FIGUEROA ST, SUITE 2050, LOS ANGELES, CA 90017
 PHONE: 213-261-4040

1450 W ARTESIA BLVD, GARDENA CA

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- LEGEND**
- PROPERTY LINE
 - LOT LINE
 - - - PROJECT AREA
 - [Stippled Box] PROPOSED LANDSCAPE, GRASS, TREE WELLS (PERVIOUS)

EXISTING PROPERTY LINE
 PROPOSED PROPERTY LINE

SITE AREA = 6.44 AC
 IMPERVIOUS AREA = 5.68 AC
 PERVIOUS AREA = 0.76 AC

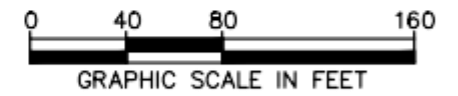


EXHIBIT 2 - PROPOSED CONDITIONS

Kimley»Horn

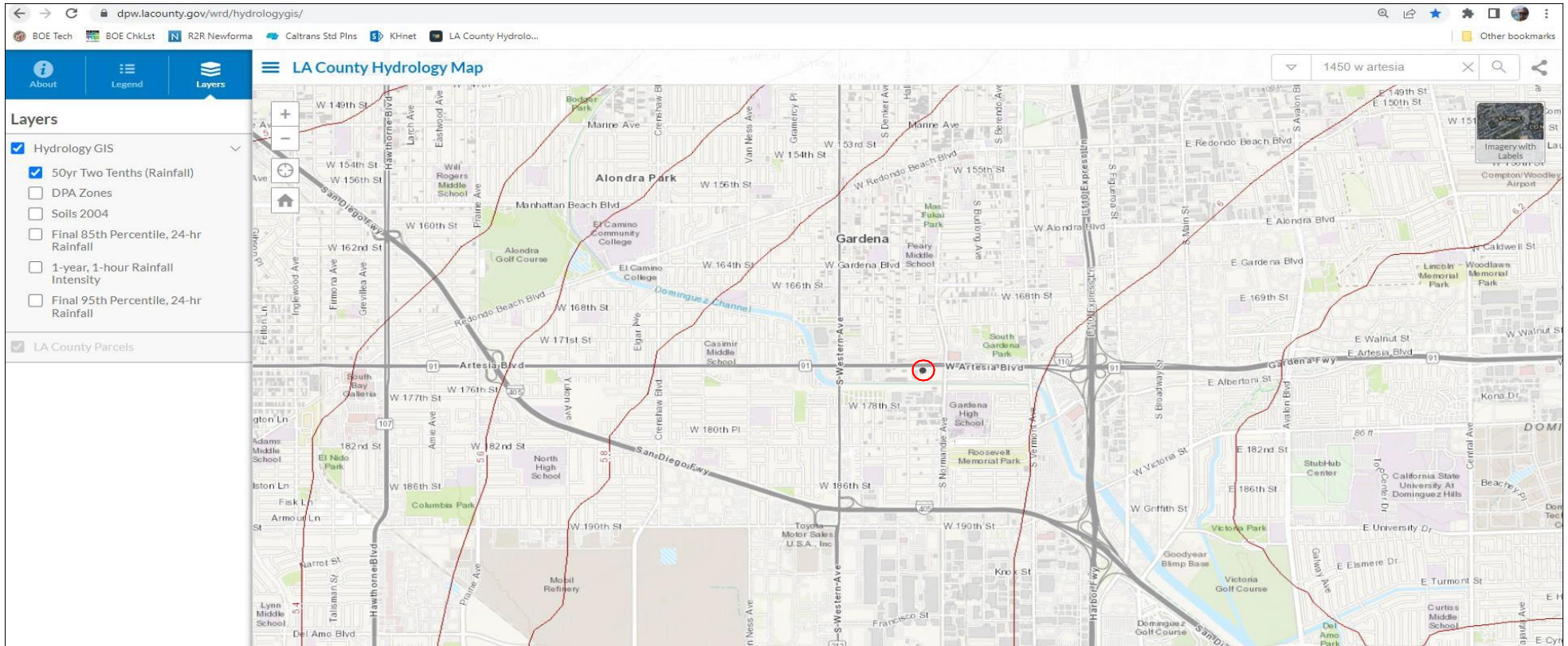
2022 KIMLEY-HORN AND ASSOCIATES, INC.
 660 S. FIGUEROA ST, SUITE 2050, LOS ANGELES, CA 90017
 PHONE: 213-261-4040

1450 W ARTESIA BLVD, GARDENA CA

©

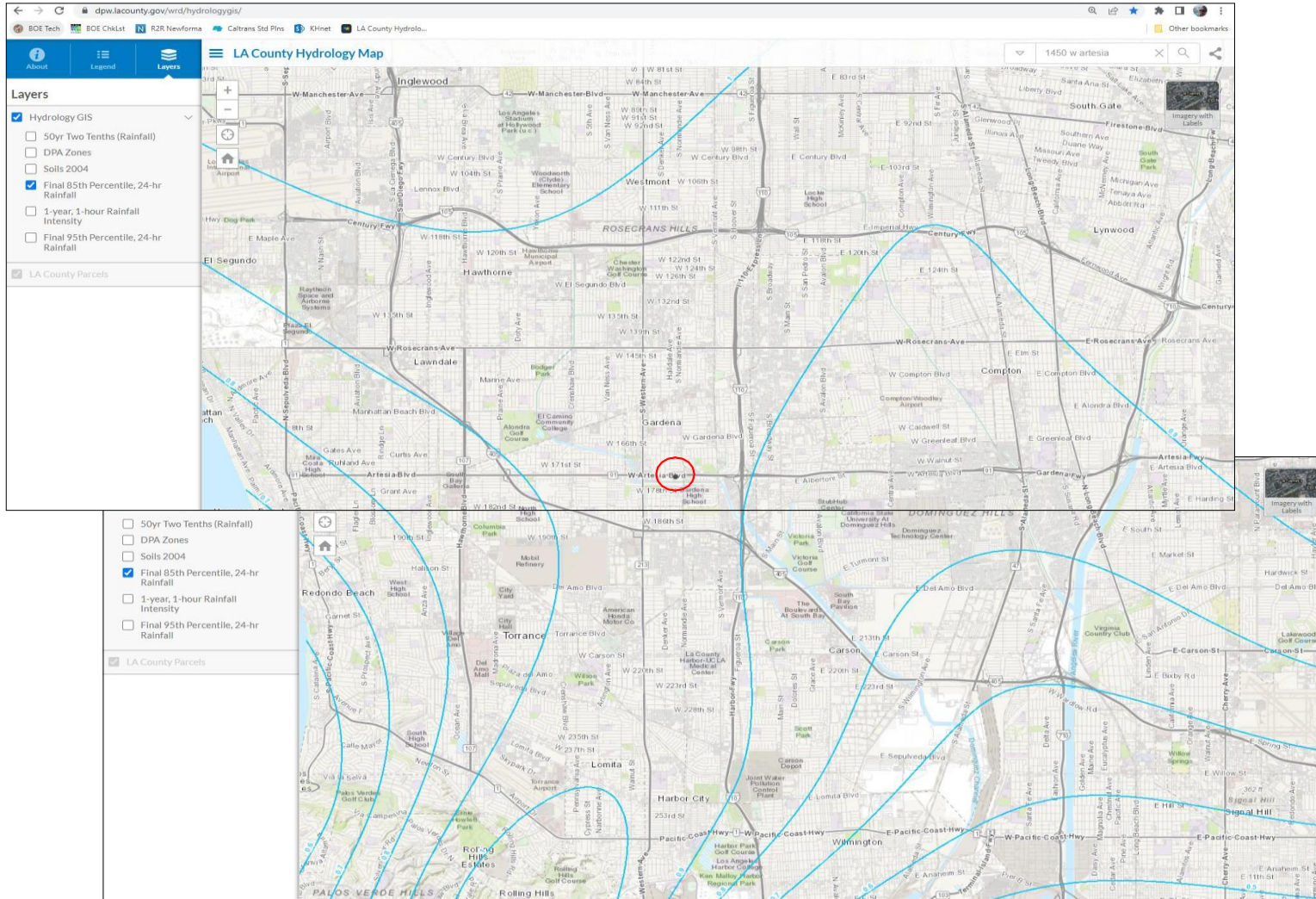
APPENDIX B

HydroCalc Input Parameters and Result Printouts

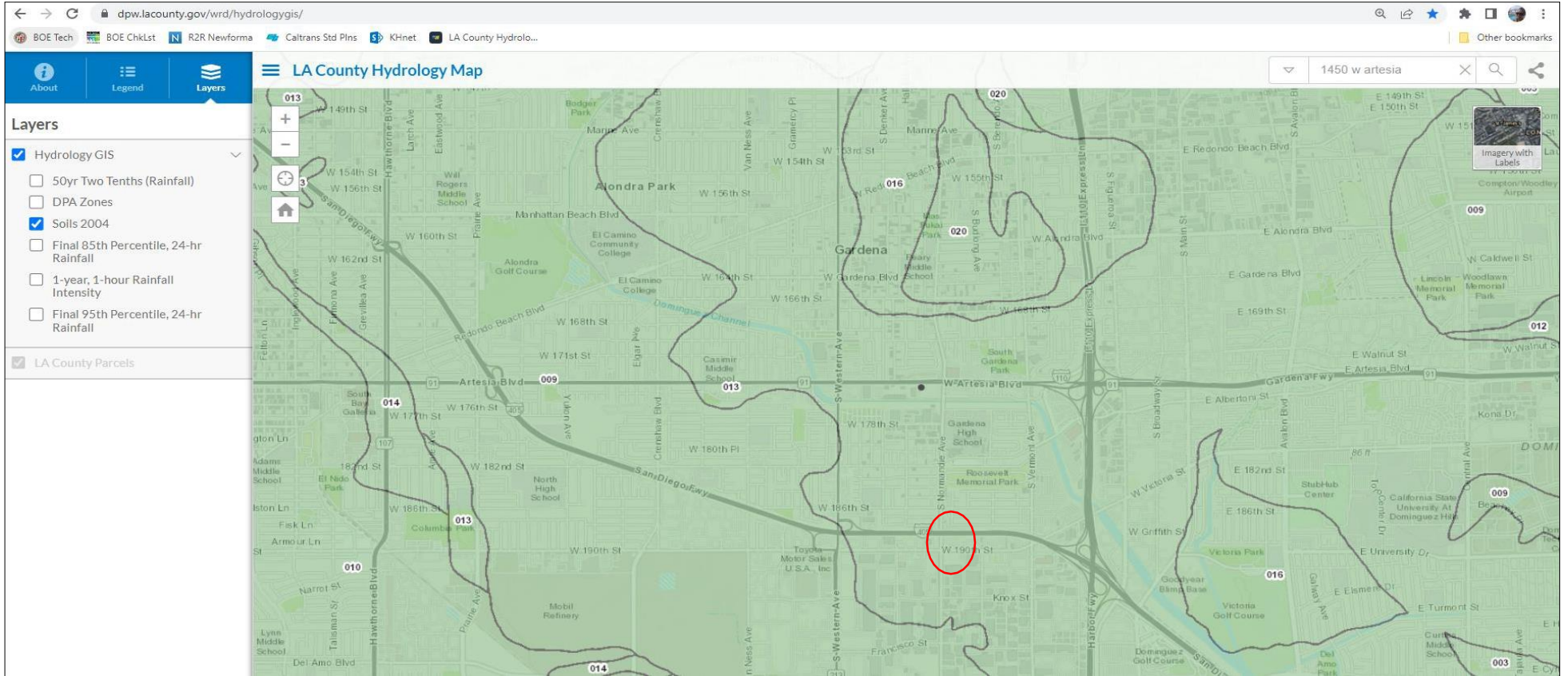


85th Percentile

0.9 in



Soil Number = 013



Peak Flow Hydrologic Analysis

File location: //orafp01/CA_ORA/ORA_PLAN/197425001.B - 1450 Artesia Blvd SP/Reports/LID/Report and Calcs/HydroCalc/1450 W Artesia - 50yr Existing
Version: HydroCalc 1.0.3

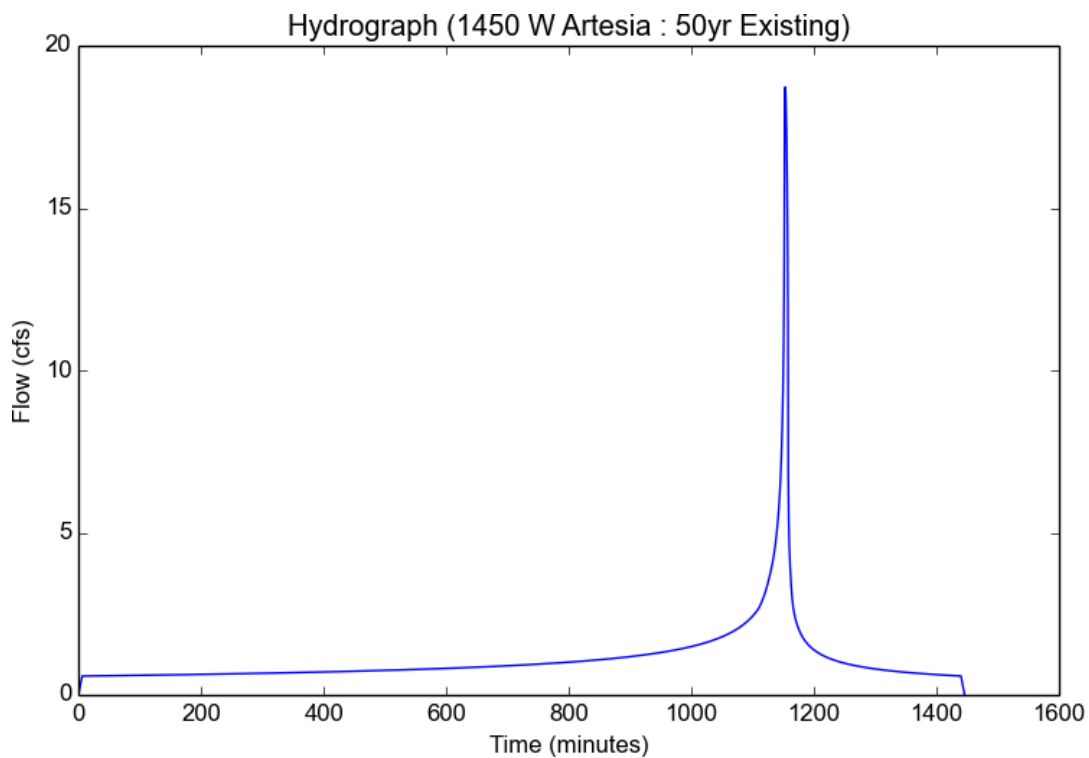
ia - 50yr Existing

Input Parameters

Project Name	1450 W Artesia
Subarea ID	50yr Existing
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.74
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.231
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	18.727
Burned Peak Flow Rate (cfs)	18.727
24-Hr Clear Runoff Volume (ac-ft)	2.2402
24-Hr Clear Runoff Volume (cu-ft)	97583.7099



Peak Flow Hydrologic Analysis

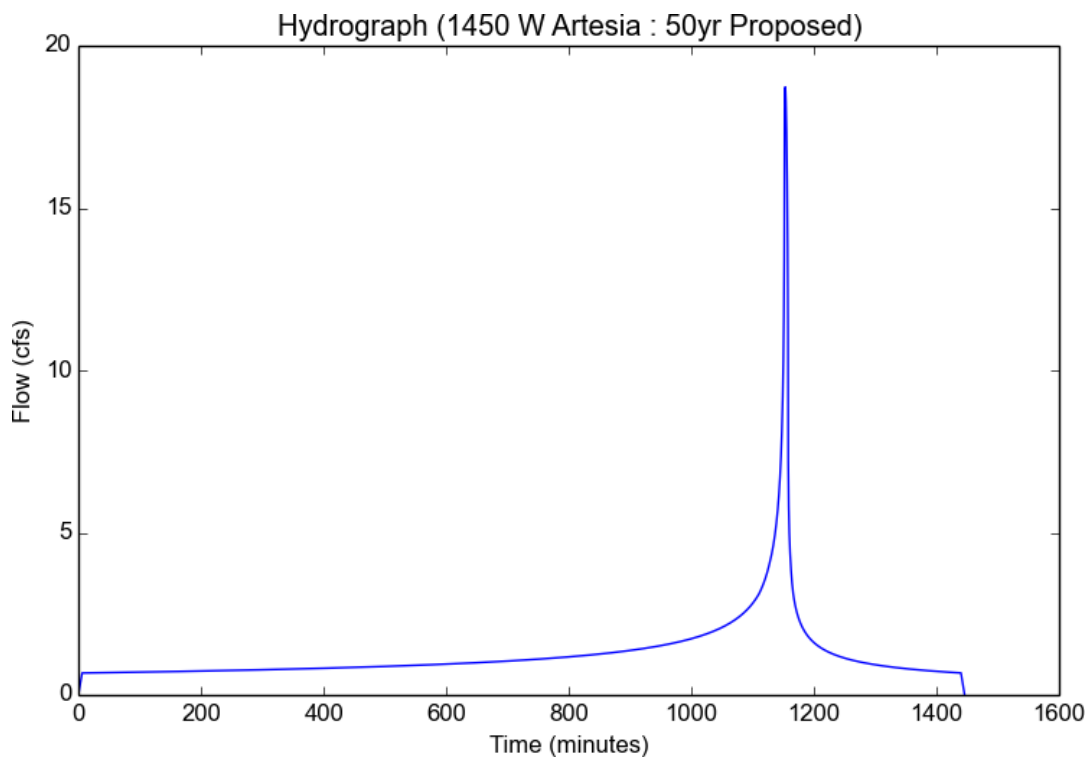
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	1450 W Artesia
Subarea ID	50yr Proposed
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.88
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.231
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	18.727
Burned Peak Flow Rate (cfs)	18.727
24-Hr Clear Runoff Volume (ac-ft)	2.5557
24-Hr Clear Runoff Volume (cu-ft)	111327.0714



Peak Flow Hydrologic Analysis

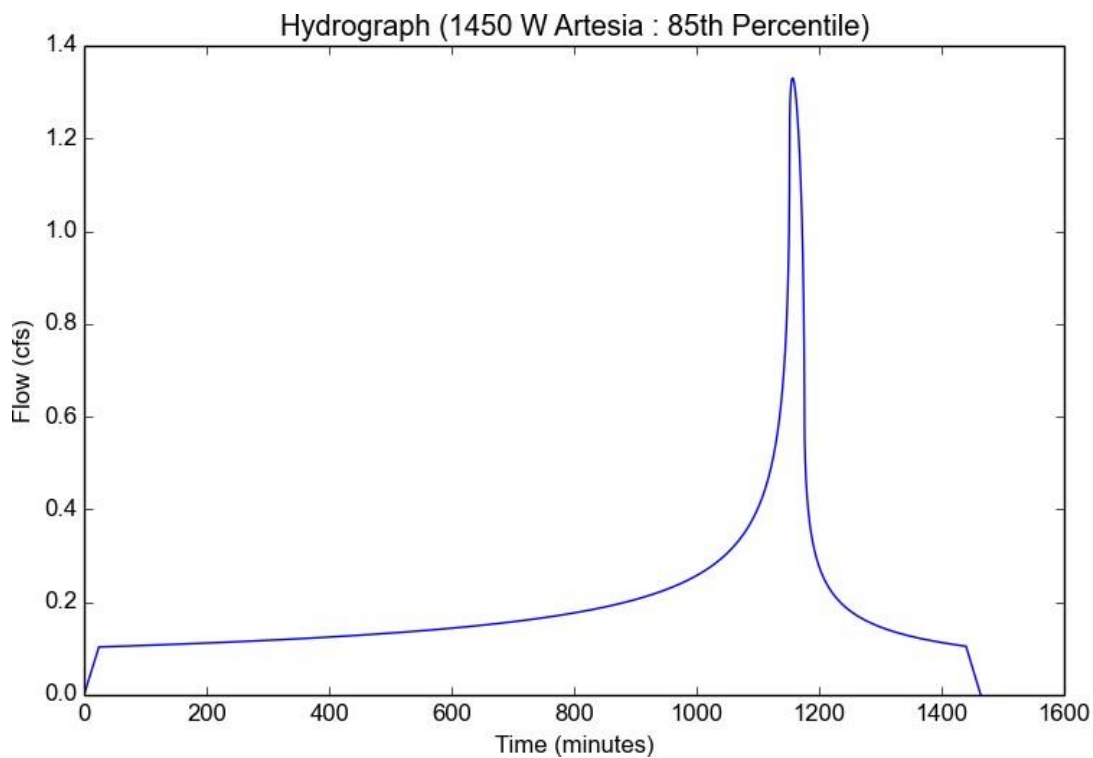
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	1450 W Artesia
Subarea ID	85th Percentile
Area (ac)	6.44
Flow Path Length (ft)	500.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	0.9
Percent Impervious	0.88
Soil Type	13
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.9
Peak Intensity (in/hr)	0.2569
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.804
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	1.3302
Burned Peak Flow Rate (cfs)	1.3302
24-Hr Clear Runoff Volume (ac-ft)	0.3851
24-Hr Clear Runoff Volume (cu-ft)	16776.0652



APPENDIX C

Calculation Summary Table

Hydrology and LID Calculations

Updated: 8/2/2022

	sf	ac
Proposed P/L Area =	280,402	6.44
Existing P/L Area =	273,618	6.28

Rainfall Depth (in)		Rainfall Depth (in)	
85th %-ile	0.9	50-yr	5.9

DETENTION

EXISTING CONDITIONS (Pre)

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length (ft)	Slope (ft/ft)	Soil Type (#)	50-Year Storm	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q50 (cfs)	V50 (cf)
Site		280,402	6.44	207,323	4.76	74%	73,079	1.68	26%	500	0.020	13	18.7	97,584
Total		280,402	6.44	207,323	4.76	74%	73,079	1.68	26%				18.7	97,584

PROPOSED CONDITIONS (Post)

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length (ft)	Slope (ft/ft)	Soil Type (#)	50-Year Storm	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q50 (cfs)	V50 (cf)
Site		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%	500	0.020	13	18.7	111,327
Total		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%				18.7	111,327

Post less Pre = 0 13,743

Required Detention = 13,743 cf

LID

PROPOSED CONDITIONS

Sub-Area (DMA)	Design Point ID	Total Area		Impervious Area			Pervious Area			Length (ft)	Slope (ft/ft)	Soil Type (#)	85th Percentile	
		sf	Acres	sf	Acres	%	sf	Acres	%				Q85th	V85th
Site		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%	500	0.020	13	1.3	16,776
Total		280,402	6.44	247,338	5.68	88%	33,064	0.76	12%				1.3	16,776

Required LID = 16,776 cf

TOTAL REQUIRED VOLUME STORED = 16,776 cf
125,485 gal