



Preliminary Hydrology Study

Butterfly Gardens

910 S. Mariposa Street
Burbank, California 91506



March 6, 2023

Prepared for

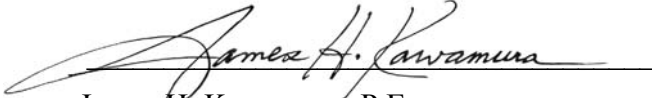
Butterfly Gardens, LLC

Prepared by



ATTESTATION

This study has been prepared under the direction of a duly Registered Civil Engineer in the State of California. The civil engineer signing below approves of the technical information included within this report along with recommendations and conclusions made.



James H. Kawamura, P.E.
Registered Civil Engineer No. C30560
Exp. 3/31/24



TABLE OF CONTENTS

Section 1 Purpose and Scope 1
Section 2 Project Information 1
 2.1 Project Description 1
 2.1.1 Project Location 1
 2.2 Hydrologic Setting 3
 2.2.1 Watershed 3
 2.2.2 Existing Topography, Drainage Patterns, and Facilities (Narrative) 3
 2.2.3 Adjacent Land Use 3
 2.2.4 Soil Conditions 3
 2.2.5 Downstream Conditions 3
 2.2.6 Impervious Cover 4
 2.3 Proposed Runoff Management Facilities 4
Section 3 Design Criteria and Methodology 4
 3.1 Design Criteria 4
 3.1.1 Drainage Design Criteria 4
 3.2 Methodology 5
 3.2.1 HydroCalc Software 5
Section 4 Hydrology and Drainage Analysis 7
 4.1 Summary of Drainage Delineation 7
 4.2 Summary of Results 7
 4.3 Conclusion 8

APPENDIX

Appendix 1 Soils Map
Appendix 2 Existing Conditions Hydrology Map
Appendix 3 Existing Conditions Peak Flow Hydraulic Analysis
Appendix 4 Proposed Conditions Hydrology Map
Appendix 5 Proposed Conditions Peak Flow Hydraulic Analysis
Appendix 6 CSV Text Files for Q Allowable Analysis

Section 1 Purpose and Scope

The hydrology study presents an analysis of the hydrologic effects that may be associated with the proposed multi-family residential development *Butterfly Gardens*. The study details the general project characteristics, design, criteria, and methodology applied to the analysis of the subject area in terms of drainage and associated conveyance and treatment facilities.

The plans and specifications in the drainage study are not for construction purposes. The contractor shall refer to final approved construction documents for plans and specifications.

Section 2 Project Information

2.1 Project Description

The proposed multi-family residential development, “*Butterfly Gardens*” proposing to develop a total of 21 townhomes. The project totals 0.88 acre site.

2.1.1 Project Location

The project site is located on 910 S Mariposa Street in the city of Burbank, California. Figure 1 below illustrates an aerial perspective of the project on-site area and surroundings and Figure 2 illustrates the vicinity map.



Figure 1 – Aerial Perspective of On-Site Area

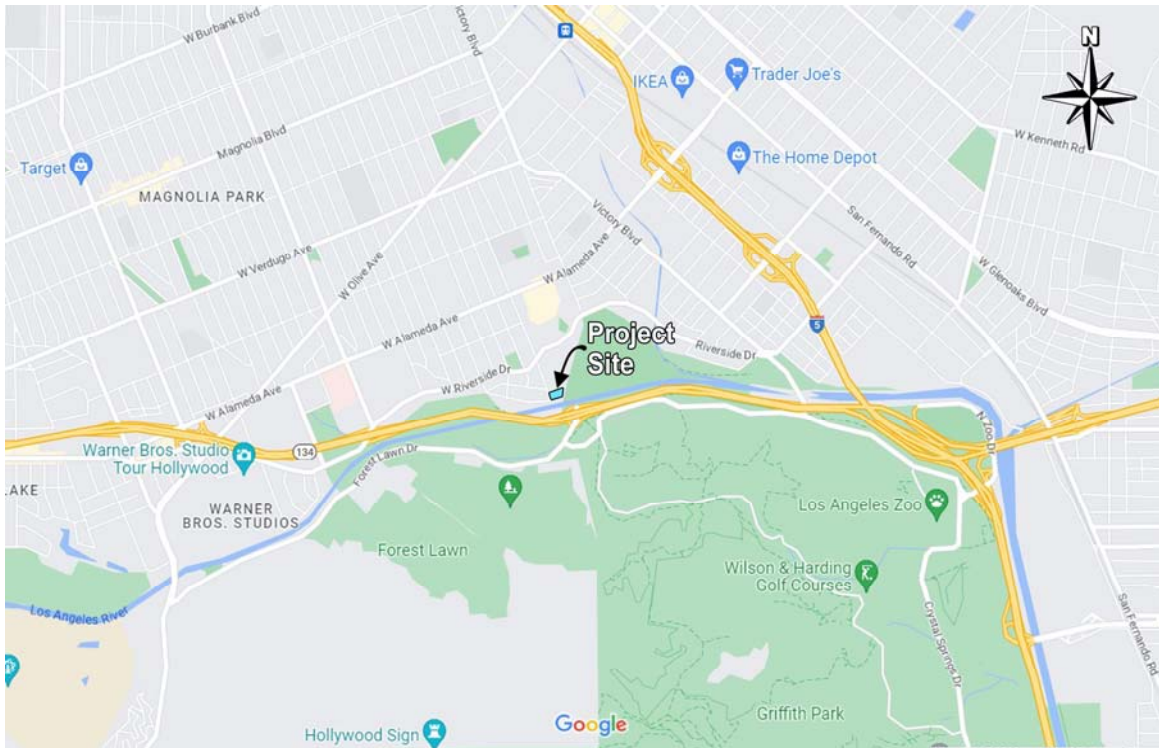


Figure 2 – Vicinity Map

2.2 Hydrologic Setting

This section summarizes the area's size and location in the context of the larger watershed perspective, topography, soil and vegetation conditions, amount of impervious area, natural and infrastructure drainage features, and other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.

2.2.1 Watershed

The proposed project is located within the 834 square mile Los Angeles River watershed. The receiving waters directly affected by the proposed development include Duarte Channel, Buena Vista Channel, Sawpit Wash, Rio Hondo Channel, Los Angeles River, Los Angeles River Estuary (Queensway Bay), and San Pedro Bay.

2.2.2 Existing Topography, Drainage Patterns, and Facilities (Narrative)

The project site is currently developed with covered stables, horse corrals, several single story structures, and natural ground. Surface water drainage at the site appears to be by sheet flow along the existing contours to the city streets or local area drains.

Runoff from a majority of the site sheet flows easterly into the adjacent property, and runoff from the remainder of the site sheet flows westerly to Mariposa Street, which flows to a LACFCD maintained catch basin on the westerly side of the street. The catch basin connects to a LACFCD maintained 36-inch reinforced concrete pipe (RCP) that discharges into the Los Angeles River.

2.2.3 Adjacent Land Use

The project site is bounded by a commercial site to the north, a powerline easement then Los Angeles Equestrian Center to the east, a horse corral structure, horse trail, and then Los Angeles River to the south, and Mariposa Street and single family residential to the west.

2.2.4 Soil Conditions

According to the Geotechnical report prepared by Geocon West, Inc. (dated January 10, 2023), the site has native soils consisting of Pleistocene to early Holocene age alluvium was encountered beneath the fill. The alluvial soils are characterized as slightly moist and very loose to very dense or very soft to hard. Groundwater was not encountered to the explored depth of 55.5 feet below grade.

2.2.5 Downstream Conditions

This section summarizes the existing downstream conditions and any conditions of concern with respect to erosion and/or sedimentation due to the proposed project.

The runoff will flow westward towards Mariposa Street. Mariposa Street channels the runoff into a catch basin on its western side, which is maintained by LACFCD. The catch basin is linked to a 36-inch reinforced concrete pipe (RCP) also maintained by LACFCD. This RCP eventually releases the runoff into the Los Angeles River.

2.2.6 *Impervious Cover*

The proposed project will have a net increase in total impervious area compared to the existing condition of the site. Currently the project prior to dedication with a total imperviousness percentage of 37% and perviousness of 63%. The proposed residential development project increases the site's overall total imperviousness percentage to 99% and decreased perviousness to 1%.

2.3 *Proposed Runoff Management Facilities*

The proposed facilities managing runoff from the area include:

- Water quality treatment control Best Management Practices (BMPs); specifically, Aqua Swirl Hydrodynamic Separator Treatment device.
- Proposed corrugated metal pipe tank and MaxWell IV drywell will be placed on the project site to meet the Low-impact Development (LID) requirements.
- A proposed drainage system will drain the project area to multiple inlets draining towards the west towards Mariposa Street to a proposed detention tank. Any overflow will connect into the County of Los Angeles storm drain network.

Section 3 Design Criteria and Methodology

This section summarizes the design criteria and methodology applied during the drainage analysis of the project site. The design criteria and methodology follows the County of Los Angeles Drainage Design Manual (January 2006).

3.1 *Design Criteria*

3.1.1 *Drainage Design Criteria*

Local storm drain facilities have been designed to conform to standards found in the County of Los Angeles Drainage Design Manual.

3.2 Methodology

3.2.1 HydroCalc Software

The HydroCalc software, developed and provided by Los Angeles County Public Works, calculates various parameters using the modified rational method, which is an iterative process. The table below shows the input data that is entered into the program and the output data that is produced.

Input Data	Output Data
Area (ac)	Modeled (10-yr) Rainfall Depth (in)
Flow Path Length (ft)	Peak Intensity (in/hr)
Flow Path Slope (vft/hft)	Undeveloped Runoff Coefficient (Cu)
24-hr, 50-yr Rainfall Depth (in)	Developed Runoff Coefficient (Cd)
Percent Impervious (0.01-1.0)	Time of Concentration (min)
Soil Type (2-180)	Clear Peak Flow Rate (cfs)
Design Storm Frequency	Burned Peak Flow Rate (cfs)
Fire Factor	24-Hr Clear Runoff Volume (ac-ft)
	24-Hr Clear Runoff Volume (cu-ft)

Once the input data has been entered, HydroCalc then computes the output data using the following steps:

1. Assumes an initial time of concentration (T_c)
2. Uses the assumed T_c to calculate rainfall intensity (I_t) with the following equation:

$$I_t = I_{1440} \times (1440/t)^{0.47}$$

Where...
 t = assumed initial time of concentration (min)
 I_t = rainfall intensity for the duration (in/hr)
 I_{1440} = 24-hour rainfall intensity (in/hr)

3. Calculates impervious area and stormwater runoff coefficient using the following equation:

$$IMP = [\sum_{i=1}^n (IMP_i \times A_i) / A_T]$$

Where...
 IMP = site percent impervious
 IMP_i = impervious area (i)
 A_i = area, i (ft^2)
 A_T = total project site area (ft^2)

$$C_d = (0.9 \times IMP) + (1.0 - IMP) \times C_u$$

Where...
 C_d = developed site stormwater runoff coefficient

IMP = site percent impervious
 C_u = undeveloped site stormwater runoff coefficient
(Obtained from soil curve data)

4. Calculates the time of concentration (T_c) and compares it to the initial assumption using the following equation:

$$T_c = [0.31 \times L^{0.483}] / [(C_d \times I_t)^{0.519} \times S^{0.135}]$$

Where...
 T_c = time of concentration (min)
 L = longest flow path length
 C_d = developed site stormwater runoff coefficient
 I_t = rainfall intensity for the duration (in/hr)
 S = slope of longest flow path (ft/ft)

If the calculated T_c and the assumed T_c are more than 0.5 minutes apart then the process is repeated by rounding the calculated T_c to the nearest minute and using it as the assumed value. The process is complete once the calculated T_c and the assumed T_c are within 0.5 minutes of each other.

5. Peak flow rate is then calculated using the rational equation, as shown below:

$$Q = C \times I \times A$$

Where...
 Q = Peak discharge (cfs);
 C = runoff coefficient, based on land use and soil type;
 I = Rainfall intensity (in/hr);
 A = watershed area (acre)

The runoff coefficient represents the ratio of rainfall that runs off the watershed versus the portion that infiltrates to the soil or is held in depression storage. The runoff coefficient is dependent on the land use coverage and soil type. The County of Los Angeles Drainage Design Manual methodology assumes hydrologic Soil Type 15 for this project site (See Appendix for Isohyet Map).

Peak discharges were computed for the 10-year hypothetical storm return frequency and the output results of the HydroCalc can be found in the appendix section of this report.

KHR has reached out to the Los Angeles County Flood Control District (LACFCD) to determine if there is a flow restriction (Q Allowable) at the project's storm drain connection point to the public system, but have not heard back at the time of this dated report. In case there is a potential flow restriction, a worst case scenario Q allowable of 0.7 cfs (cubic feet per second) per acre, which is 0.616 cfs for the proposed project conditions, was used for the allowed discharge. Once the allowable Q is received from LACFCD, it can be determined what the detention volume will be, if any.

Section 4 Hydrology and Drainage Analysis

This section summarizes the quantitative hydrologic analysis of the existing site.

4.1 Summary of Drainage Delineation

Existing Analysis

To analyze the existing conditions, the site was broken into one subarea: EX-A (see **Appendix 2** for the Existing Conditions Hydrology Map).

Runoff from subarea EX-A majority of the sheet flows easterly into the adjacent property, and runoff from the remainder of the site sheet flows westerly to Mariposa Street, which flows to a LACFCD maintained catch basin on the westerly side of the street. The catch basin connects to a LACFCD maintained 36-inch RCP that discharges into the Los Angeles River.

Proposed Analysis

To analyze the proposed conditions, the site was broken into one subarea: A (see **Appendix 4** for the Proposed Conditions Hydrology Map).

Runoff from Subarea P-A, will ultimately flow to the proposed grated catch basin. The site runoff will be routed to an Aqua-Swirl Hydrodynamic Separator for pre-treatment prior to detention by a corrugated metal pipe (CMP) and infiltration into the underlying soils by means of a MaxWell IV drywell. Flow in excess of the stormwater volume to be mitigated will bypass the treatment system and connect to an existing catch basin located on Mariposa Street.

4.2 Summary of Results

The following tables summarize the results of the 10-year, 24-hour storm events for the existing and proposed conditions for the proposed project area (see **Appendix 3 and 5** for the HydroCalc Calculations).

The existing conditions results for the 10-year, 24-hour storm events for the project site are summarized in **Table 1**.

Table 1: Existing Conditions Hydrology

Subarea	Area (acres)	Q ₁₀ (cfs)	Q ₂₅ (cfs)	Q ₅₀ (cfs)
EX-A	0.88	1.34	1.97	2.34

The proposed conditions results for the 10-year, 24-hour storm events for the project site are summarized in **Table 2**.

Table 2: Proposed Conditions Hydrology

Subarea	Area (acres)	Q ₁₀ (cfs)	Q ₂₅ (cfs)	Q ₅₀ (cfs)
P-A	0.88	2.21	2.72	3.10

Based on the contributing subarea, the breakdown of the assumed allowable flow (Q_{allowable}) for the connection to the existing County of Los Angeles storm drain system is summarized below.

Q_{allowable} for County Connection & Storage				
Subarea	Total Area (acres)	Q _{allowable} Factor (cfs/acre)	Q _{allowable} (cfs)	Calculated Storage (cf)
A	0.88	0.7	0.62	2,630

The proposed project will be connecting into the County’s storm drain system at a flow rate that does not exceed the assumed Q allowable flow rate factor to be determined by the County of Los Angeles Public Works. The calculations indicate that flow rate at the county connection surpasses the Q allowable, and therefore detention of the volume during the Q allowable exceedance will be required. To meet the Q allowable, the subarea will restrict the outlet pipe to the private main and direct flows higher than the Q allowable into CMP tanks sized to receive the detention volume, and prevent negative hydrological impacts to the site.

4.3 Conclusion

The proposed conditions has a higher on-site 50-year storm flow rate of 3.10 cfs compared to the existing on-site flow rate of 2.34 cfs due to an increase of imperviousness and the design of the proposed storm drain system. However, a 6 foot by 47 foot detention tank has the capacity to store up to 2,630 cubic feet of water to be detained to connect to a County storm drain system at an allowable flow rate. Any overflow not captured and infiltrated will bypass the system and discharge into the existing catch basin located on Mariposa Street. Once the allowable Q is received from LACFCD, it can be determined what the detention volume will be, if any. The change in runoff from existing to proposed conditions, considering the onsite infiltration, it is minimal and does not significantly impact the downstream storm drain system and receiving waters.

APPENDIX

Appendix 1 – Soils Map

About

Legend

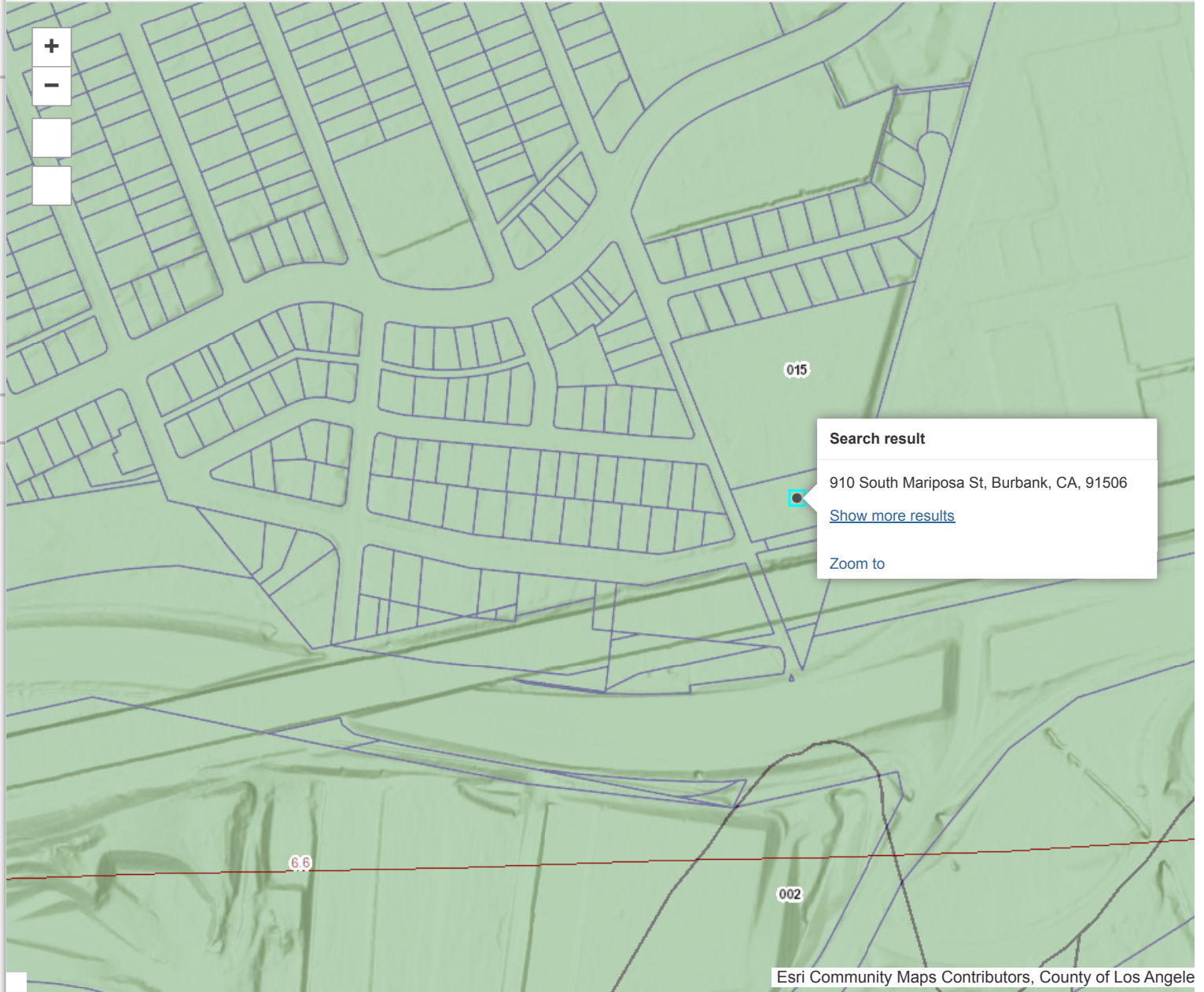
Layers

LA County Hydrology Map

Layers

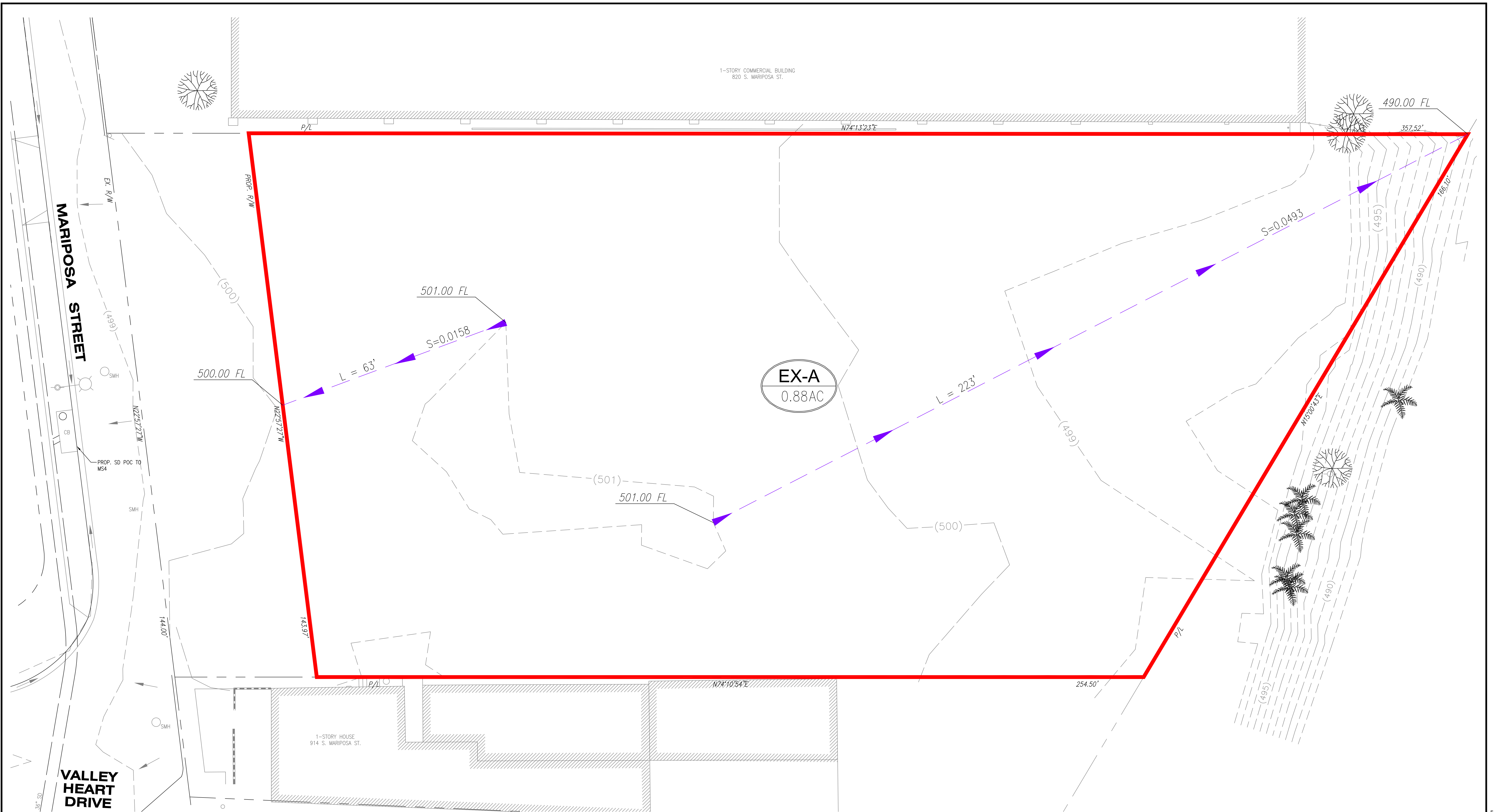
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 - DPA Zones
 - Soils 2004
 - Final 85th Percentile, 24-hr Rainfall
 - 1-year, 1-hour Rainfall Intensity
 - Final 95th Percentile, 24-hr Rainfall

- LA County Parcels



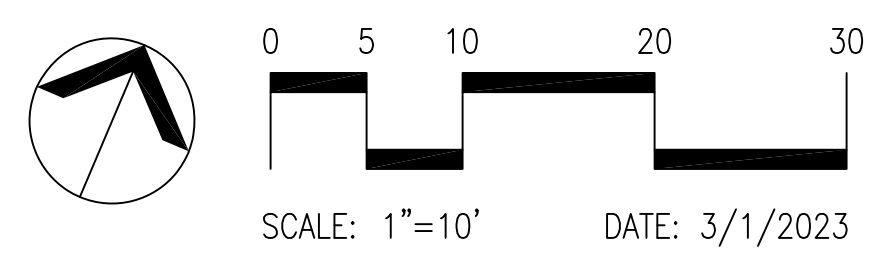
Esri Community Maps Contributors, County of Los Angeles

Appendix 2 – Existing Conditions Hydrology Map



LEGEND

	SUBAREA BOUNDARY
	SURFACE FLOW PATH ONSITE
	SUBAREA LABEL



BUTTERFLY GARDENS
BUTTERFLY GARDENS LLC

PRELIMINARY EXISTING HYDROLOGY MAP
910 S. MARIPOSA STREET, BURBANK, CALIFORNIA 91506

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 17530 Von Karman Avenue - Suite 200 Tel (949) 756-6440
 Irvine, California 92614

Appendix 3 – Existing Conditions Peak Flow Hydraulic Analysis

Peak Flow Hydrologic Analysis

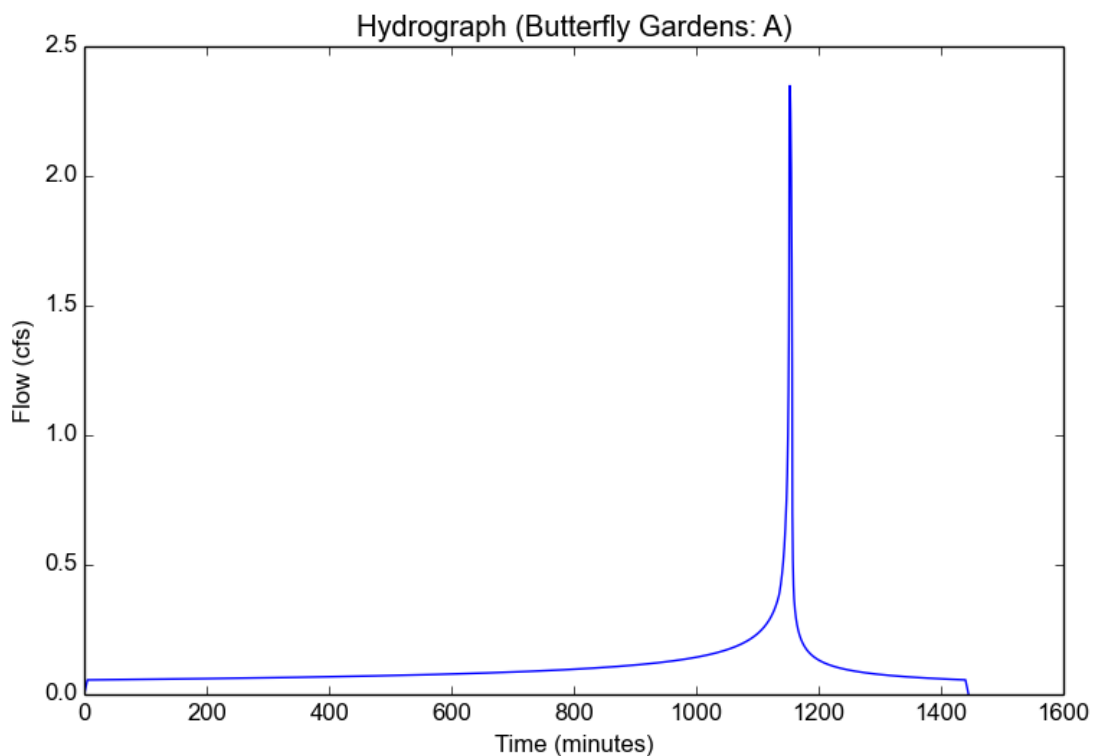
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Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Butterfly Gardens
Subarea ID	A
Area (ac)	0.88
Flow Path Length (ft)	223.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.41
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	3.9974
Undeveloped Runoff Coefficient (Cu)	0.506
Developed Runoff Coefficient (Cd)	0.6675
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.3482
Burned Peak Flow Rate (cfs)	2.3482
24-Hr Clear Runoff Volume (ac-ft)	0.2156
24-Hr Clear Runoff Volume (cu-ft)	9392.3943



Peak Flow Hydrologic Analysis

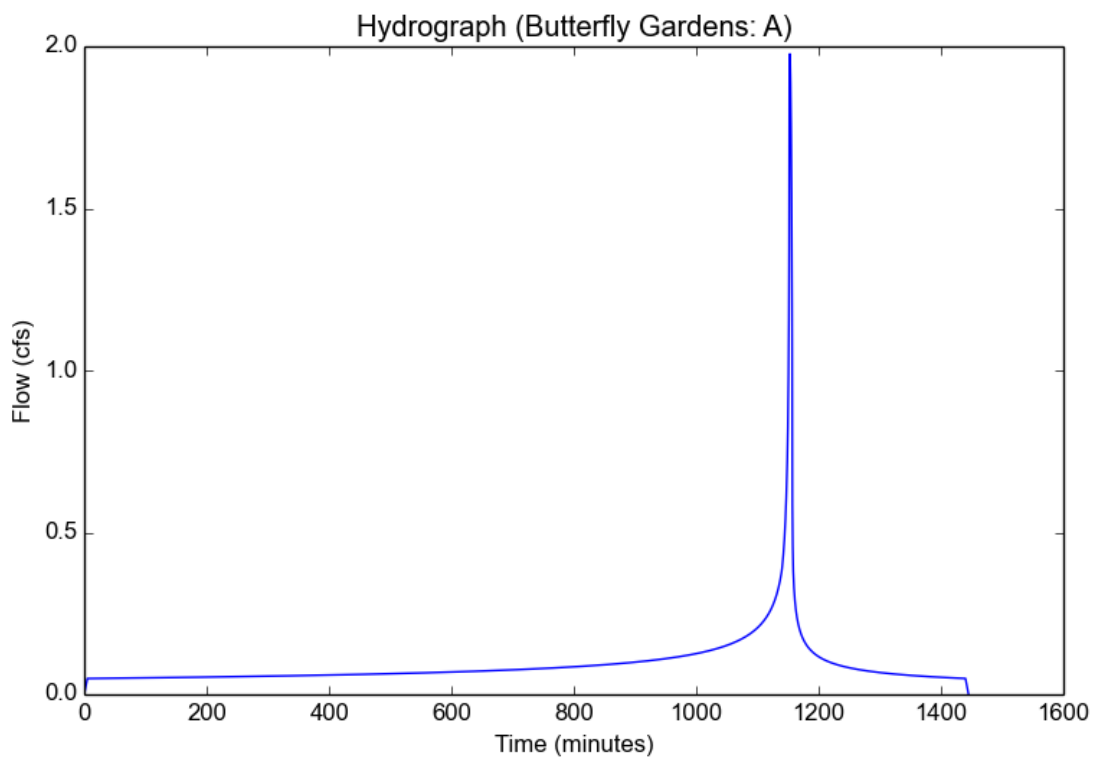
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Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Butterfly Gardens
Subarea ID	A
Area (ac)	0.88
Flow Path Length (ft)	223.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.41
Soil Type	15
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.8826
Peak Intensity (in/hr)	3.5097
Undeveloped Runoff Coefficient (Cu)	0.4594
Developed Runoff Coefficient (Cd)	0.64
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.9768
Burned Peak Flow Rate (cfs)	1.9768
24-Hr Clear Runoff Volume (ac-ft)	0.1882
24-Hr Clear Runoff Volume (cu-ft)	8199.7178



Peak Flow Hydrologic Analysis

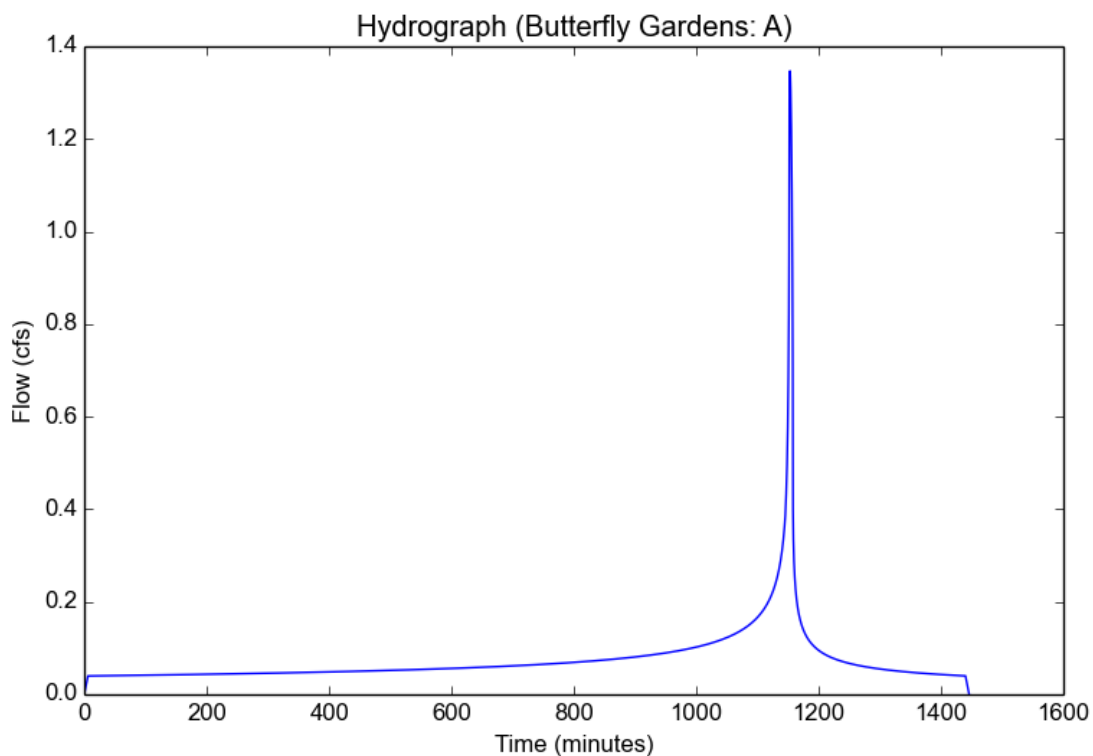
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Version: HydroCalc 0.3.1-beta

Input Parameters

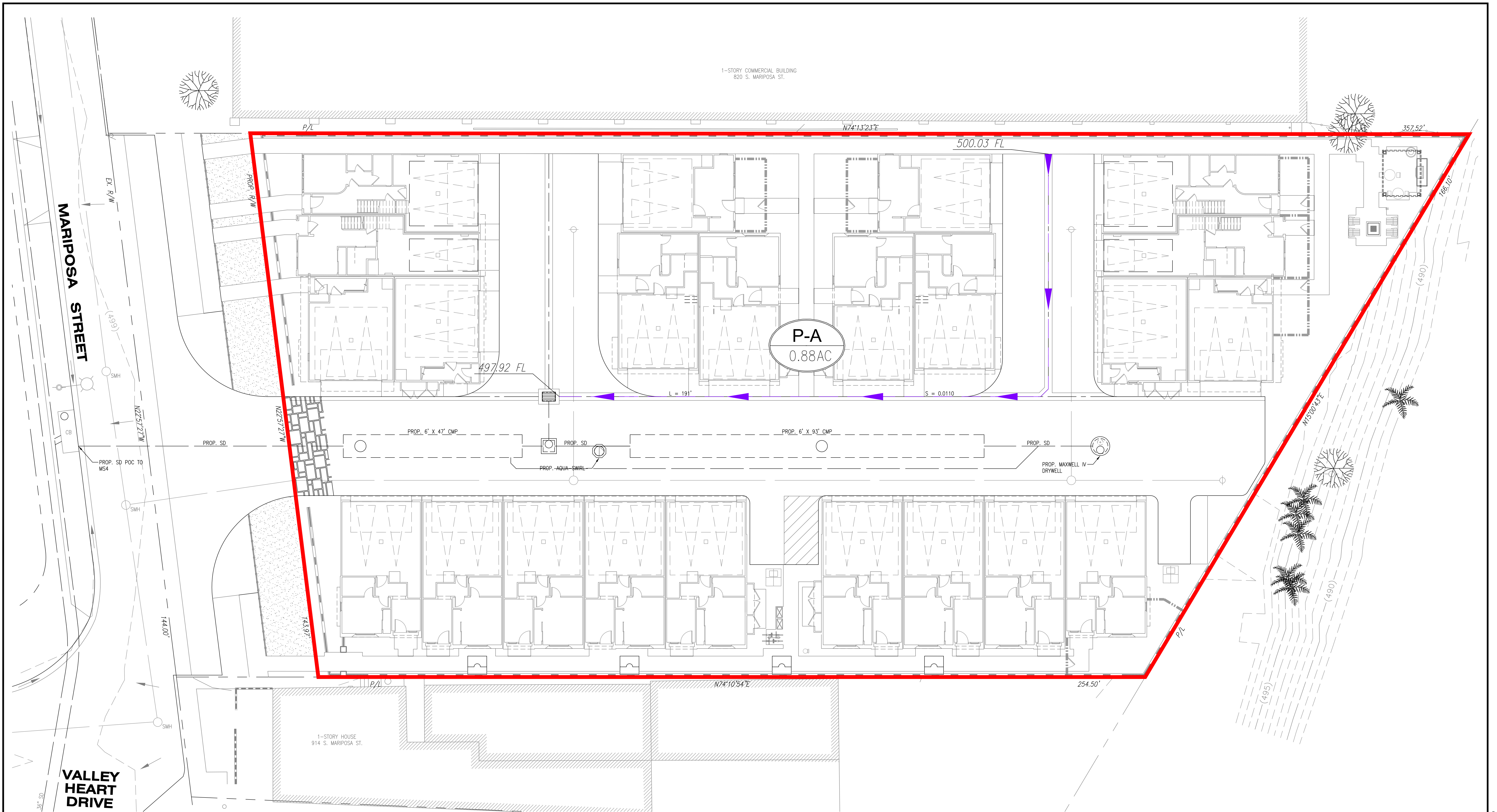
Project Name	Butterfly Gardens
Subarea ID	A
Area (ac)	0.88
Flow Path Length (ft)	223.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.41
Soil Type	15
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.7838
Peak Intensity (in/hr)	2.6198
Undeveloped Runoff Coefficient (Cu)	0.3649
Developed Runoff Coefficient (Cd)	0.5843
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	1.347
Burned Peak Flow Rate (cfs)	1.347
24-Hr Clear Runoff Volume (ac-ft)	0.1518
24-Hr Clear Runoff Volume (cu-ft)	6613.2699

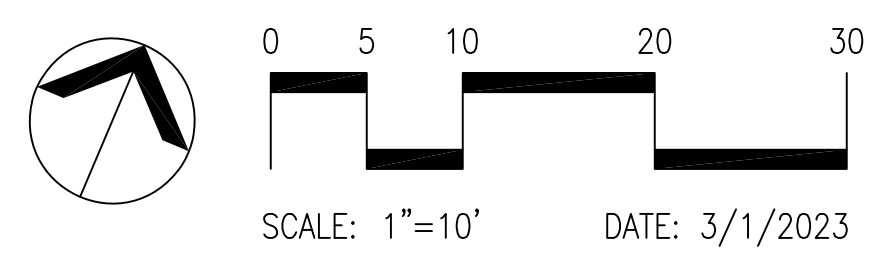


Appendix 4 – Proposed Conditions Hydrology Map



LEGEND

	SUBAREA BOUNDARY
	SURFACE FLOW PATH ONSITE
	SUBAREA LABEL



BUTTERFLY GARDENS
BUTTERFLY GARDENS LLC

PRELIMINARY PROPOSED HYDROLOGY MAP
910 S. MARIPOSA STREET, BURBANK, CALIFORNIA 91506

KHR ASSOCIATES
 CONSULTING ENGINEERS/SURVEYORS/PLANNERS
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 Irvine, California 92614

Appendix 5 – Proposed Conditions Peak Flow Hydraulic Analysis

Peak Flow Hydrologic Analysis

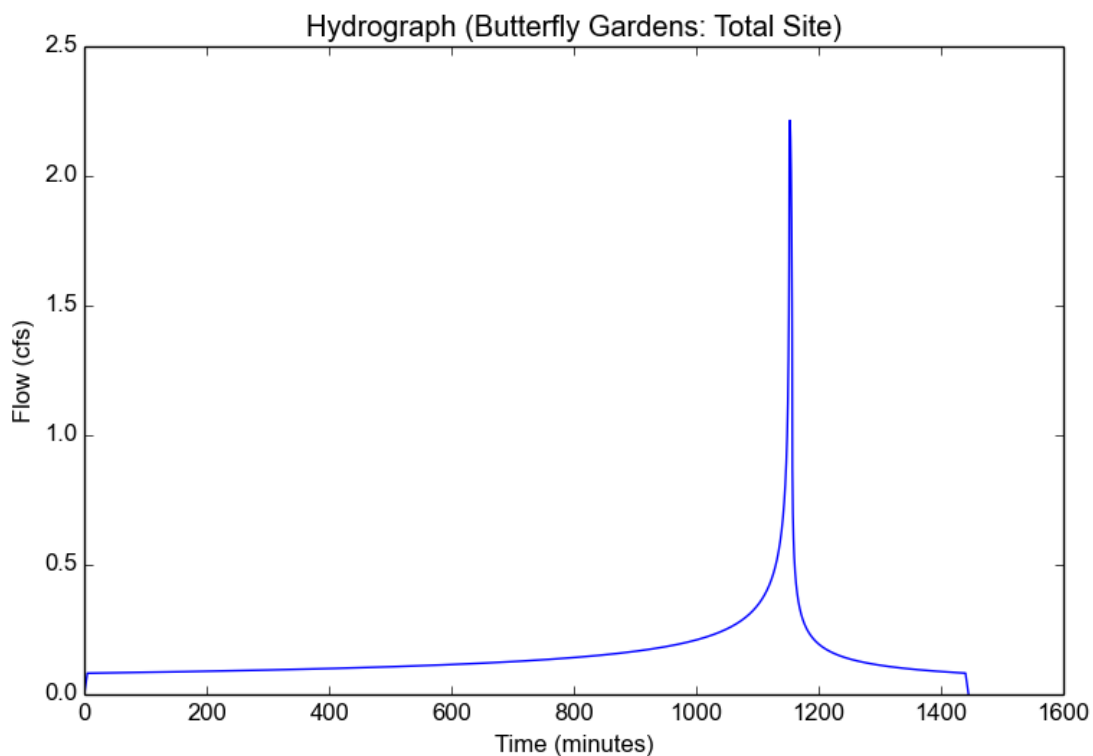
File location: C:/Users/Josh/KHR Associates Dropbox/R Drive/Sanka Properties/Documents/Hydrology/Hydrology Calcs/Proposed/Butterfly Gardens - To
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Butterfly Gardens
Subarea ID	Total Site
Area (ac)	0.88
Flow Path Length (ft)	200.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.6
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.7124
Peak Intensity (in/hr)	2.8115
Undeveloped Runoff Coefficient (Cu)	0.388
Developed Runoff Coefficient (Cd)	0.8949
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.2141
Burned Peak Flow Rate (cfs)	2.2141
24-Hr Clear Runoff Volume (ac-ft)	0.3058
24-Hr Clear Runoff Volume (cu-ft)	13318.7265



Peak Flow Hydrologic Analysis

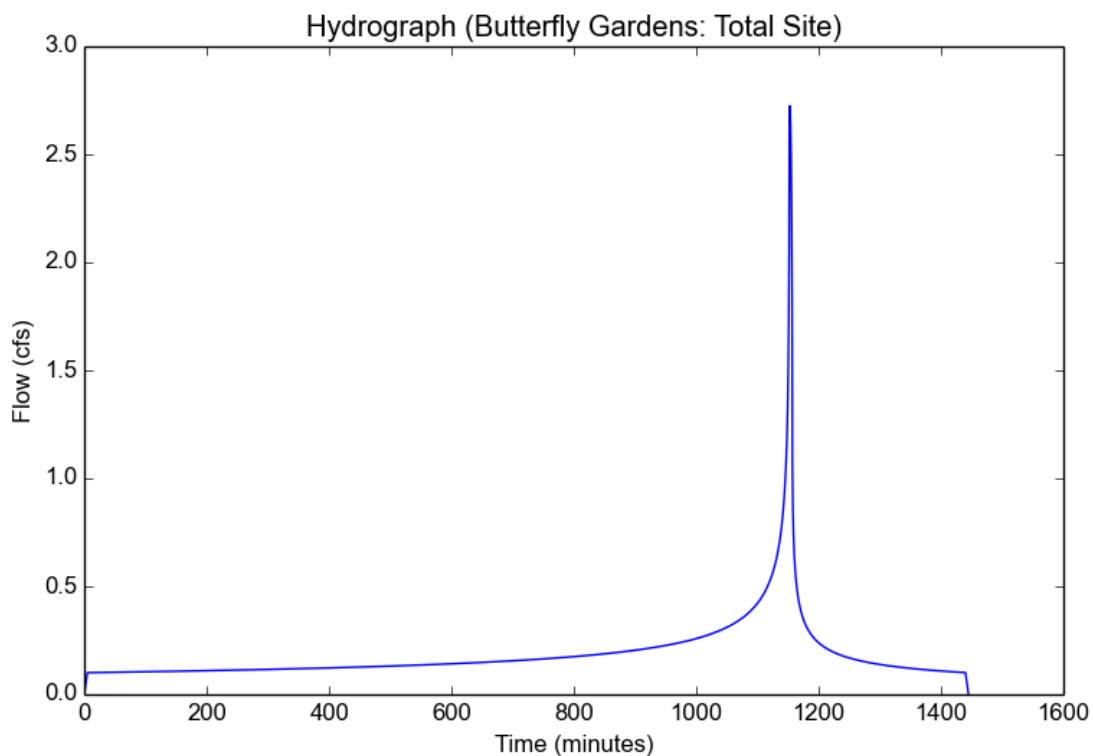
File location: C:/Users/Josh/KHR Associates Dropbox/R Drive/Sanka Properties/Documents/Hydrology/Hydrology Calcs/Proposed/Butterfly Gardens - To
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Butterfly Gardens
Subarea ID	Total Site
Area (ac)	0.88
Flow Path Length (ft)	200.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.6
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.7948
Peak Intensity (in/hr)	3.4573
Undeveloped Runoff Coefficient (Cu)	0.4544
Developed Runoff Coefficient (Cd)	0.8955
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.7247
Burned Peak Flow Rate (cfs)	2.7247
24-Hr Clear Runoff Volume (ac-ft)	0.376
24-Hr Clear Runoff Volume (cu-ft)	16378.9251



Peak Flow Hydrologic Analysis

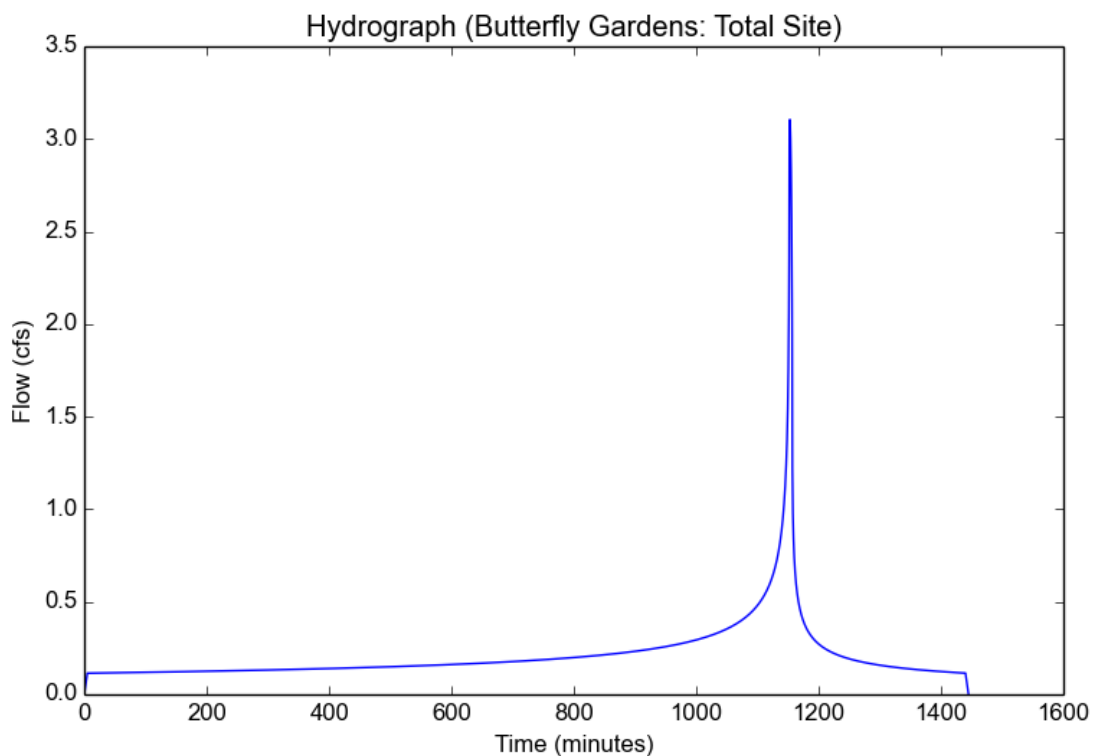
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Butterfly Gardens
Subarea ID	Total Site
Area (ac)	0.88
Flow Path Length (ft)	200.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.6
Percent Impervious	0.99
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.6
Peak Intensity (in/hr)	3.9377
Undeveloped Runoff Coefficient (Cu)	0.5003
Developed Runoff Coefficient (Cd)	0.896
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.1048
Burned Peak Flow Rate (cfs)	3.1048
24-Hr Clear Runoff Volume (ac-ft)	0.4283
24-Hr Clear Runoff Volume (cu-ft)	18655.6838



Appendix 6 – CSV Text Files for Q Allowable Analysis

Inputs: Butterfly Gardens

Subarea ID	Area (ac)	Flow Path Length (ft)	Flow Path Slope (vft/hft)	50-yr Rainfall Depth (in)	Percent Impervious	Soil Type	Design Storm Frequency	Fire Factor	Qallowable Factor (cfs/ac)	Qallowable (cfs)
Total Site	0.88	200	0.01	6.6	0.99	15	50-yr	0	0.7	0.616

Outputs: Butterfly Gardens

Area (ac)	Modeled (50-yr) Rainfall Depth (in)	Time of Concentration (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
Total Site	6.6	5	3.104841	0.428275569	3.10484079	3.937741	0.500307605	0.896003076

Hydrograph: Butterfly Gardens - Total Site

Time (min)	Incremental Masscurve	Incremental Design Storm Depth (in)	Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)	Clear Peak Flow Rate (cfs)	Incremental Volume (cu-ft)	Cumulative Volume (cu-ft)	Over Q Flow (cfs)	Over Q Volume (cf)
1122.4	0.68510403	4.52168663	0.784762	0.1	0.892	0.616007	7.381274002	12684.11281	6.659E-06	7.9908E-05
1122.6	0.68551614	4.52440653	0.787077	0.1	0.892	0.617824	7.402985735	12691.5158	0.001824297	0.02189156
1122.8	0.68592957	4.52713515	0.789415	0.1	0.892	0.619659	7.424898888	12698.94069	0.003658851	0.04390621
1123	0.68634433	4.52987257	0.791774	0.1	0.892	0.621511	7.447016628	12706.38771	0.005510587	0.06612704
1123.2	0.68676044	4.53261887	0.794155	0.1	0.892	0.62338	7.469342192	12713.85705	0.007379778	0.08855734
1123.4	0.6871779	4.53537416	0.796559	0.1	0.892	0.625267	7.491878889	12721.34893	0.009266703	0.11120044
1123.6	0.68759674	4.53813851	0.798985	0.1	0.892	0.627172	7.514630103	12728.86356	0.011171647	0.13405976
1123.8	0.68801697	4.54091203	0.801436	0.1	0.892	0.629095	7.537599295	12736.40116	0.013094902	0.15713882
1124	0.68843861	4.5436948	0.803909	0.1	0.892	0.631037	7.560790005	12743.96195	0.015036766	0.18044119
1124.2	0.68886166	4.54648694	0.806407	0.1	0.892	0.632998	7.584205854	12751.54616	0.016997544	0.20397053
1124.4	0.68928614	4.54928853	0.80893	0.1	0.892	0.634978	7.607850549	12759.15401	0.018977548	0.22773058
1124.6	0.68971207	4.55209969	0.811477	0.1	0.892	0.636977	7.631727881	12766.78574	0.020977099	0.25172519
1124.8	0.69013947	4.5549205	0.81405	0.1	0.892	0.638997	7.655841731	12774.44158	0.022996523	0.27595828
1125	0.69056835	4.55775108	0.816648	0.1	0.892	0.641036	7.680196072	12782.12177	0.025036156	0.30043387
1125.2	0.69099872	4.56059153	0.819273	0.1	0.892	0.643096	7.704794971	12789.82657	0.02709634	0.32515608
1125.4	0.6914306	4.56344196	0.821924	0.1	0.892	0.645177	7.729642593	12797.55621	0.029177426	0.35012911
1125.6	0.69186401	4.56630248	0.824602	0.1	0.892	0.64728	7.754743204	12805.31095	0.031279775	0.37535373
1125.8	0.69229897	4.5691732	0.827308	0.1	0.892	0.649404	7.780101173	12813.09106	0.033403754	0.40084505
1126	0.69273549	4.57205424	0.830042	0.1	0.892	0.65155	7.805720977	12820.89678	0.035549742	0.4265969
1126.2	0.69317359	4.57494572	0.832804	0.1	0.892	0.653718	7.831607201	12828.72838	0.037718125	0.4526175
1126.4	0.6936133	4.57784775	0.835596	0.1	0.892	0.655909	7.857764548	12836.58615	0.0399093	0.4789116
1126.6	0.69405462	4.58076046	0.838417	0.1	0.892	0.658124	7.884197834	12844.47035	0.042123673	0.50548408
1126.8	0.69449757	4.58368397	0.841268	0.1	0.892	0.660362	7.910912001	12852.38126	0.044361661	0.53233993
1127	0.69494218	4.5866184	0.84415	0.1	0.892	0.662624	7.937912113	12860.31917	0.046623691	0.55948429
1127.2	0.69538847	4.58956389	0.847063	0.1	0.892	0.66491	7.965203366	12868.28437	0.048910203	0.58692244
1127.4	0.69583645	4.59252056	0.850007	0.1	0.892	0.667222	7.992791088	12876.27716	0.051221645	0.61465974
1127.6	0.69628614	4.59548855	0.852984	0.1	0.892	0.669558	8.020680748	12884.29785	0.053558479	0.64270175
1127.8	0.69673758	4.598468	0.855994	0.1	0.892	0.671921	8.048877955	12892.34672	0.05592118	0.67105416
1128	0.69719076	4.60145904	0.859038	0.1	0.892	0.67431	8.077388468	12900.42411	0.058310232	0.69972278
1128.2	0.69764573	4.60446183	0.862115	0.1	0.892	0.676726	8.106218199	12908.53033	0.060726135	0.72871362
1128.4	0.6981025	4.60747649	0.865228	0.1	0.892	0.679169	8.135373218	12916.6657	0.063169401	0.75803281
1128.6	0.69856109	4.61050319	0.868376	0.1	0.892	0.681641	8.164859758	12924.83056	0.065640558	0.7876867
1128.8	0.69902153	4.61354207	0.871561	0.1	0.892	0.68414	8.194684224	12933.02525	0.068140146	0.81768175
1129	0.69948383	4.61659329	0.874782	0.1	0.892	0.686669	8.224853195	12941.2501	0.07066872	0.84802464
1129.2	0.69994803	4.619657	0.878041	0.1	0.892	0.689227	8.255373433	12949.50547	0.073226852	0.87872222
1129.4	0.70041415	4.62273337	0.881338	0.1	0.892	0.691815	8.286251886	12957.79173	0.075815129	0.90978155
1129.6	0.70088221	4.62582257	0.884675	0.1	0.892	0.694434	8.3174957	12966.10922	0.078434154	0.94120985
1129.8	0.70135224	4.62892475	0.888051	0.1	0.892	0.697085	8.349112224	12974.45833	0.08108455	0.9730146
1130	0.70182426	4.6320401	0.891468	0.1	0.892	0.699767	8.381109014	12982.83944	0.083766953	1.00520344
1130.2	0.7022983	4.63516879	0.894927	0.1	0.892	0.702482	8.413493847	12991.25294	0.086482022	1.03778426
1130.4	0.70277439	4.638311	0.898428	0.1	0.892	0.70523	8.446274724	12999.69921	0.089230432	1.07076518
1130.6	0.70325256	4.64146691	0.901973	0.1	0.892	0.708013	8.479459881	13008.17867	0.092012881	1.10415457
1130.8	0.70373284	4.64463672	0.905562	0.1	0.892	0.71083	8.513057798	13016.69173	0.094830085	1.13796102
1131	0.70421524	4.64782061	0.909196	0.1	0.892	0.713683	8.547077209	13025.23881	0.097682783	1.1721934

1157.2	0.82382505	5.4372453	1.551343	0.227126786	0.89327127	1.219478	16.03757585	15225.34933	0.603477553	7.24173064
1157.4	0.8243064	5.44042225	1.440483	0.205024676	0.89305025	1.132053	14.1091831	15239.45851	0.516052964	6.19263557
1157.6	0.82477945	5.44354436	1.361777	0.185366231	0.89285366	1.069964	13.2121005	15252.67061	0.453963786	5.44756543
1157.8	0.82524462	5.44661448	1.299669	0.169853326	0.89269853	1.020987	12.54570528	15265.21632	0.404987093	4.85984512
1158	0.82570231	5.44963524	1.248075	0.15696653	0.89256967	0.980314	12.00780858	15277.22412	0.364314337	4.37177204
1158.2	0.82615288	5.45260903	1.203861	0.145923176	0.89245923	0.945469	11.55470053	15288.77883	0.329469085	3.95362902
1158.4	0.82659668	5.45553806	1.165163	0.136257654	0.89236258	0.914978	11.16268476	15299.94151	0.298978376	3.58774051
1158.6	0.827034	5.45842438	1.130768	0.127666778	0.89227667	0.887883	10.8171698	15310.75868	0.271883257	3.26259908
1158.8	0.82746513	5.46126988	1.099835	0.119940417	0.8921994	0.863519	10.50841478	15321.26709	0.247519207	2.97023048
1159	0.82789035	5.4640763	1.071752	0.112926098	0.89212926	0.841404	10.22954003	15331.49663	0.225404132	2.70484958
1159.2	0.82830989	5.46684528	1.046061	0.106509234	0.89206509	0.821176	9.975479454	15341.47211	0.205175777	2.46210932
1159.4	0.82872399	5.46957834	1.022407	0.100601274	0.89200601	0.802554	9.7423801	15351.21449	0.18655424	2.23865088
1159.6	0.82913286	5.4722769	1.000511	0.1	0.892	0.785361	9.527492455	15360.74199	0.169361169	2.03233403
1159.8	0.82953671	5.47494229	0.980146	0.1	0.892	0.769376	9.32842125	15370.07041	0.153375706	1.84050847
1160	0.82993572	5.47757574	0.961129	0.1	0.892	0.754447	9.142939094	15379.21335	0.138447476	1.66136971
1160.2	0.83033006	5.48017842	0.943304	0.1	0.892	0.740456	8.969422362	15388.18277	0.124456251	1.49347501
1160.4	0.83071991	5.48275143	0.926545	0.1	0.892	0.727301	8.806544353	15396.98931	0.111301141	1.33561369
1160.6	0.83110543	5.48529581	0.910743	0.1	0.892	0.714897	8.653186579	15405.6425	0.098896622	1.18675946
1160.8	0.83148675	5.48781253	0.895803	0.1	0.892	0.70317	8.50839691	15414.1509	0.08716953	1.04603436
1161	0.83186402	5.4903025	0.881646	0.1	0.892	0.692057	8.371357851	15422.52225	0.076056779	0.91268135
1161.2	0.83223736	5.4927666	0.868202	0.1	0.892	0.681504	8.241362121	15430.76362	0.065503575	0.7860429
1161.4	0.83260692	5.49520565	0.855409	0.1	0.892	0.671462	8.117793584	15438.88141	0.055462022	0.66554426
1161.6	0.83297279	5.49762043	0.843215	0.1	0.892	0.66189	8.000112172	15446.88152	0.045890006	0.55068007
1161.8	0.8333351	5.50001168	0.831571	0.1	0.892	0.65275	7.887841829	15454.76936	0.036750298	0.44100358
1162	0.83369395	5.5023801	0.820436	0.1	0.892	0.64401	7.780560762	15462.54993	0.028009829	0.33611795
1162.2	0.83404945	5.50472635	0.809773	0.1	0.892	0.635639	7.677893505	15470.22782	0.019639089	0.23566907
1162.4	0.83440168	5.50705109	0.799546	0.1	0.892	0.627612	7.579504379	15477.80732	0.011611641	0.13933969
1162.6	0.83475074	5.5093549	0.789726	0.1	0.892	0.619904	7.48509208	15485.29242	0.003903706	0.04684447

Total Over Q	
Volume (cf)	1315.41107