

APPENDIX J

Hydrology and Water Quality Technical Memorandum



Water Resources and Hydrology Technical Memo

Antelope Valley Line Capacity and Service Improvements Program

Project	Antelope Valley Line Capacity and Service Improvements Program
Project #	21-019.0
Client	Mott MacDonald
Subject	Water Resources and Hydrology Technical Memorandum
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Introduction

Watearth Inc. (Watearth) performed a Hydrological Evaluation for three proposed capital improvement projects along the Antelope Valley Line (AVL) rail corridor to determine drainage patterns, peak flows, and potential hydromodification and erosion that could result from the improvements. Further, an impact analysis was performed for the proposed construction and operation activities.

The Hydrological Evaluation was conducted using a desktop study and site reconnaissance. The desktop study evaluated existing soils, generated drainage areas and hydrologic parameters, and identified streams and outfalls used in modeling based on satellite digital elevation model (DEM) imagery obtained from the United States Department of Agriculture (USDA). The site reconnaissance observations were obtained from Metrolink stations, station parking lots, and public roads due to the constraints accessing the Metro right-of-way (ROW). Results and conclusions are discussed at the end of this memorandum (Memo).

Project Description

The Proposed Project would construct three capital improvements along the existing AVL rail corridor to provide operational flexibility and facilitate increased and more reliable Metrolink service along the corridor. The AVL right of way (ROW) is owned by Metro and used by the Southern California Regional Rail Authority (SCRRA), which operates Metrolink commuter rail service. The AVL is an existing 76.6-mile rail corridor that runs from LAUS in the City of Los Angeles to the Lancaster Terminal in the City of Lancaster within the County of Los Angeles. The corridor consists of the former Southern Pacific Valley Line and parallels the Interstate 5 (I-5) freeway from Los Angeles to Santa Clarita, turns east, then north, to parallel State Route 14 (SR-14) to the City of Lancaster.

The route is Federal Railroad Administration Track Class 4, with a maximum speed of 79 miles per hour (mph). The Union Pacific Railroad (UPRR) operates Class 1 freight service along the corridor as well. There are up to 30 Metrolink commuter trains and 12 UPRR freight trains per day on the AVL.

Figure 1 shows the regional context of the Project corridor and the location of the proposed capital improvements.

Project Objectives

The AVL plays a critical role in connecting communities in North Los Angeles County to LAUS and the cities in between. Consistent with the State Rail Plan and Metrolink's Southern California Optimized Rail Expansion (SCORE) program, and in anticipation of substantial population and employment growth in the North Los Angeles County region over the next 20 years, Metro seeks to improve rail service on the AVL to realize its full potential as a regional mobility enhancement and not just a peak-hour commuter service. Accordingly, the AVL Capacity and Service Enhancement Improvement Project seeks to:

- Provide regular and more frequent Metrolink services to improve regional connectivity, and accessibility through the enabling of 30-minute bi-directional passenger rail service to the Santa Clarita Valley, and 60-minute bi-directional service to Lancaster along the AVL corridor.
- Improve passenger service reliability and efficiency on the AVL rail corridor.
- Provide necessary infrastructure improvements to enhance operational flexibility and reliability along the AVL corridor.
- Support the vision and goals for rail service in the region consistent with the California State Rail 2040 Plan and Metrolink's SCORE program.

Proposed Project

The Proposed Project is intended to enable improved service along the AVL by constructing three capital improvements at three locations strategically selected along the AVL corridor to provide the most operational flexibility possible for the level of investment available. These three capital improvements are the Balboa Double Track Extension in the City of Los Angeles, the Canyon Siding Extension in the City of Santa Clarita, and the Lancaster Terminal Improvements in the City of Lancaster.

Balboa Double Track Extension

The Balboa Double Track Extension would extend the existing Sylmar siding approximately 6,300 feet north from Balboa Boulevard to Sierra Highway. It is anticipated that the existing railroad ROW would accommodate most of the Balboa Double Track Extension. In addition to installation of the proposed double track extension, the improvement would require realignment of the existing Main Track through portions of the site to accommodate the second track and the required clearance to existing structures. The proposed double track would be positioned to the east of the existing AVL Main Track and would tie-in at the existing Sylmar siding terminus on the south end of the site and reconnect with the existing Main Track at the north end just south of the Sierra Highway road bridge. **Figure 2** presents the location of the proposed improvement and its surroundings.

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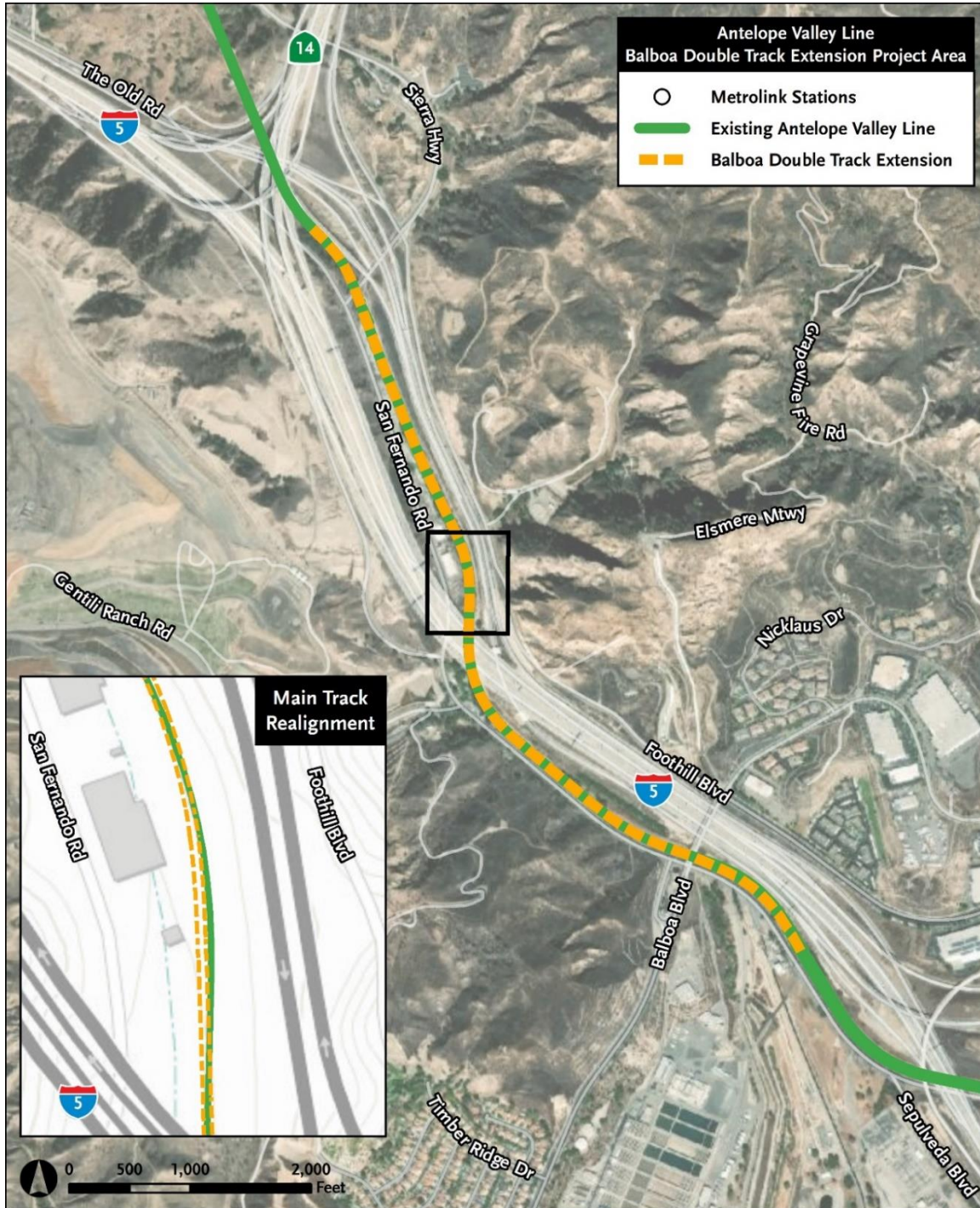


Figure 2: Balboa Double Track Extension Vicinity
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Canyon Siding Extension

The Canyon Siding Extension would improve the existing Saugus Siding by adding approximately 8,400 feet of new track between Bouquet Canyon Road and Golden Oak Road. The Canyon Siding Extension would not require realignment of the Main Track as there is adequate horizontal clearance for both tracks within the existing ROW. The proposed Canyon Siding Extension would include a second side-platform at the existing Santa Clarita Metrolink Station. A new crossover track south of the Santa Clarita Station would be provided to facilitate turnback of Metrolink trains at Santa Clarita Station and improve operational flexibility and reliability. **Figure 3** provides the location of the proposed Canyon Siding Extension and its surroundings.

Platform to Platform Pedestrian Undercrossing Design Option

An option to use a grade separated pedestrian undercrossing at Santa Clarita Station has been considered to connect the existing platform to the new second platform.

Island Platform with Platform to Parking Lot Pedestrian Undercrossing Design Option

An option to provide a new island platform (with two platform faces) has been considered and would include a grade separated pedestrian undercrossing connecting the Santa Clarita Metrolink Station parking area to the new island platform.

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Figure 3: Canyon Siding Extension Vicinity

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Lancaster Terminal Improvements

The Lancaster Terminal Improvements would include the expansion of the existing train layover facilities by adding one new 1,000-foot-long and two 500-foot-long train storage tracks of Lancaster Boulevard. The train storage track design may require an operating easement within the UPRR ROW subject to further design refinements. The proposed layover facility would accommodate up to four 5-car trains. **Figure 4** provides the location of the proposed improvement and its surroundings.

Island Platform with Pedestrian Undercrossing Design Option

An option has been developed to provide an island platform with two platform faces at Lancaster Station. The island platform would be constructed within the footprint of the existing station platform and parking lot at Lancaster Station. A grade separated pedestrian undercrossing to the island platform would be constructed in the middle of the new island platform with ramps for access to the proposed island platform.

Island Platform with Pedestrian Overcrossing Design Option

Similar to the previous option (Island Platform with Pedestrian Undercrossing Design Option), the Island Platform with Pedestrian Overcrossing Design Option would have generally the same track and station configuration and would use a grade separated pedestrian overcrossing to access the island platform. The pedestrian overcrossing would be constructed on the north end of the island platform with stairs and an elevator to go up and over the railroad track. Pedestrians would access the ground level in the station parking lot near the existing Lancaster Metrolink Station building.

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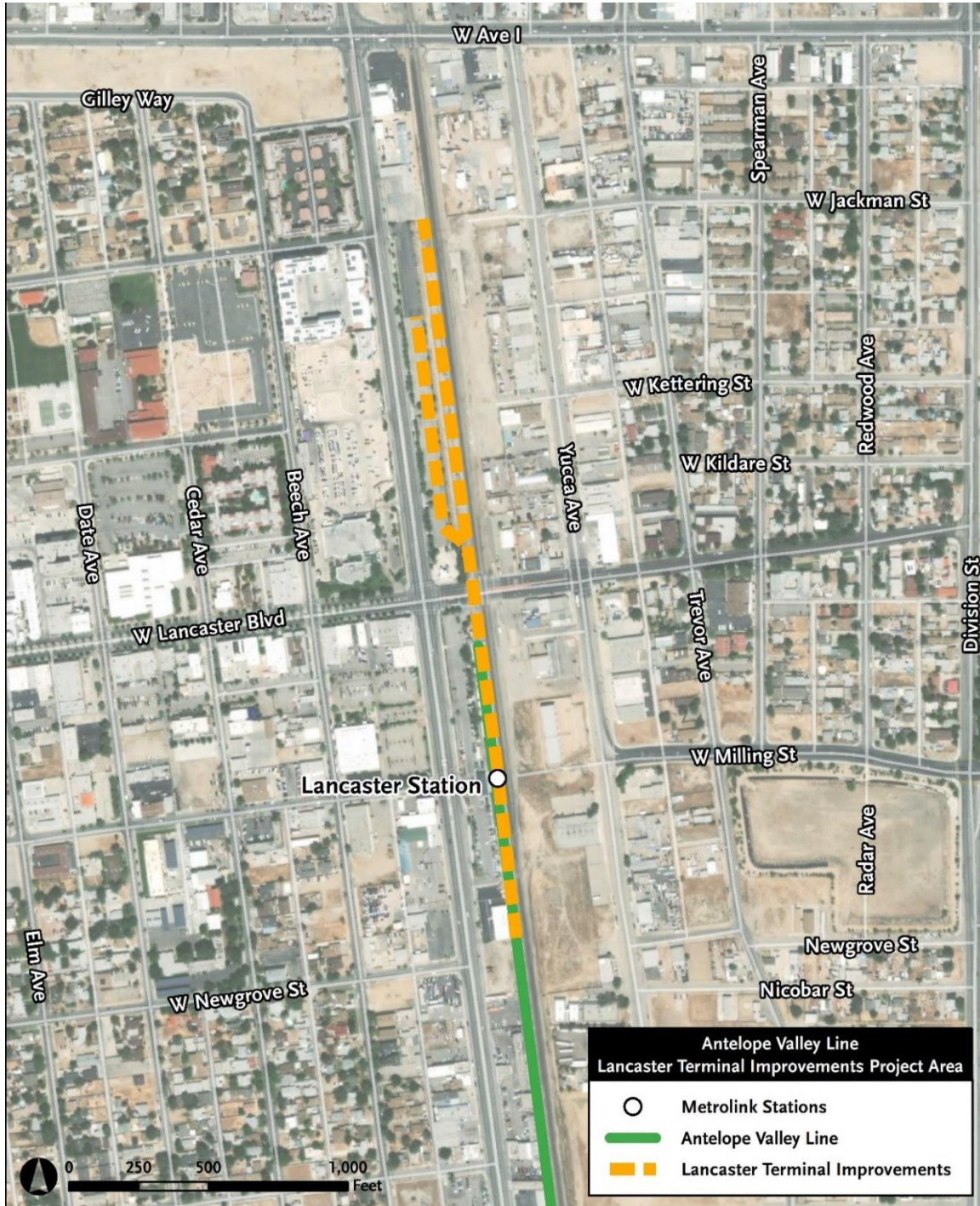


Figure 4: Lancaster Terminal Improvements Vicinity Map

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Operational Characteristics

The Proposed Project is intended to enable the increase in Metrolink service to 30-minute bi-directional service from LAUS to the Santa Clarita Valley and 60-minute bi-directional services to Lancaster. As of 2019, Metrolink operates 30 weekday trains, 12 Saturday trains, and 12 Sunday trains with an end-to-end trip time of approximately two hours and 15 minutes. Peak service operates roughly every 30-60 minutes with most of the trains making all stops, and one train providing express service. Non-peak direction service operates from every 45 minutes to over two hours and does not serve all the northern-most stations (Vincent Grade/Acton, Palmdale and Lancaster). Train speeds along the AVL range from approximately 30 to 70 mph depending on topography, track geometry, and whether there is a single track or double track configuration.

Construction

The Proposed Project would almost entirely be constructed within existing rail or street ROW. Minor acquisitions, easements, or temporary construction easements may be necessary at select locations mainly to accommodate construction staging and laydown areas and to accommodate the required grading activities associated with the proposed capital improvements. Generally, construction activities associated with each Capital Improvement would include site clearing, grading and retaining wall installation, utility relocation and installation, and track and systems installation and station platform construction.

Construction equipment anticipated to be used for the Proposed Project include track installation equipment, front-end loaders, dump and haul trucks, excavators, medium to large rams for braking rock, small/medium scrapers, drills for tiebacks/rock bolts, construction forklifts, crane, concrete pump trucks, concrete haul trucks, rail-mounted drill rig (for pier protection wall installation) and utility/service vehicles.

The construction duration of the Proposed Project is expected to last approximately 24 months per Capital Improvement. For safety reasons and to limit disruptions to rail service, project specific work windows would be required for much of the construction work. Similarly, certain activities that could disrupt rail service may require nighttime and weekend construction to minimize disruption. The overall project schedule anticipates construction commencing beginning 2024 and completion in 2028.

Regulatory Framework

Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (EPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finances municipal wastewater treatment facilities, and manages polluted runoff. The CWA authorizes the EPA to implement water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under Section 402(p) of the CWA controls water pollution by regulating stormwater discharges into the waters of the U.S. California has an approved state NPDES program. The EPA has delegated authority for water permitting to the State Water Resources Control Board (SWRCB), which has nine regional boards. The Lahontan Regional Water Quality Control Board (RWQCB - Region 6V) and the Los Angeles RWQCB (Region 4) regulate water quality in the project area.

Sections 401 and 404 of the CWA are administered through the Regulatory Program of the U.S. Army Corps of Engineers (USACE) and regulate the water quality of all discharges of fill or dredged material into waters of the U.S. including wetlands and intermittent stream channels. Section 401, Title 33, Section 1341 of the CWA sets forth water quality certification requirements for "any applicant applying for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters." If there are ephemeral drainages and wetlands identified in the Proposed Plan Area, construction and other activities may require the acquisition of a permit from the USACE under Section 404 of the CWA and water quality certification from the RWQCB under Section 401 of the CWA. Section 401 certification is required from the RWQCB prior to final issuance of Section 404 permits by the USACE.

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). These waters are identified in the Section 303(d) list as waters that are polluted and need further attention to support their beneficial uses. Once the water body or segment is listed, the state is required to establish a total maximum daily load (TMDL) for the pollutant causing the conditions of impairment. TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards.

Typically, TMDL is the sum of allowable loads of a single pollutant from all contributing point and non-point sources. The intent of the 303(d) list is to identify water bodies that require future development of a TMDL to maintain water quality. In accordance with Section 303(d), the Lahontan and Los Angeles RWQCBs have identified impaired water bodies within their respective jurisdictions and the pollutant or stressor responsible for impairing the water quality. There are several lakes, reservoirs, rivers, and creeks within the project area that are on the 303(d) impaired water bodies list. Therefore, future development pursuant to the Proposed Project within the project area could adversely impact these impaired water bodies.

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National Pollutant Discharge Elimination System

The NPDES permit program was established by the CWA to regulate municipal and industrial discharges to surface waters of the United States from their municipal separate storm sewer systems (MS4s). Under the NPDES program, all facilities which discharge pollutants into waters of the U.S. are required to obtain an NPDES permit. Requirements for stormwater discharges are also regulated under this program. In California, the NPDES permit program is administered by the SWRCB through the nine RWQCBs.

The capital improvement sites are subject to the waste discharge requirements of the Los Angeles County MS4 Permit (Order No. R4-2012-0175) and NPDES Permit No. CAS004001, as amended by Order No. R8-2010-0062. Los Angeles County, the Los Angeles County Flood Control District (LACFCD), and 84 incorporated cities within the coastal watersheds of Los Angeles County are co-permittees under the MS4 Permit, except for the City of Long Beach, which is covered under a separate MS4 permit. Pursuant to the MS4 Permit, the co-permittees have the flexibility to develop Watershed Management Programs (WMP), which implement the requirements of the Permit on a watershed scale through customized strategies, control measures, and best management practices (BMPs). WMPs have been developed for the Upper Santa Clara River Watershed, the Upper Los Angeles River Watershed, and the Upper San Gabriel River Watershed, all of which encompass part of the project area. No management program has been adopted for the Antelope Valley Watershed. The MS4 Permit also requires the municipalities to develop and implement low impact development (LID) ordinances and green streets policies in at least 50% of the area covered by the WMP.

The MS4 Permit also requires that new development or significant redevelopment projects use BMPs, including site design planning, source control, and treatment techniques to ensure that the water quality of receiving waters is protected. These requirements are detailed in the *Los Angeles County's 2014 Low Impact Development Standards Manual*. Within the project area, any new development designated and non-designated projects must meet the requirements of the *LID Standards Manual*. To ensure that the LID measures are maintained, the Los Angeles County Department of Public Works (DPW) may require submittal of a Maintenance Plan and execution of a Maintenance Agreement with the owner/operator of the stormwater quality control measures.

State Regulations and County Regulations

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Act (Water Code Sections 13000 et seq.) is the basic water quality control law for California. Under this Act, the SWRCB has ultimate control over state water rights and water quality policy. In California, the EPA has delegated authority to issue NPDES permits to the SWRCB. The state is divided into nine regions related to water quality and quantity characteristics. The SWRCB, through its nine RWQCBs, carries out the regulation, protection, and administration of water quality in each region.

Each regional board is required to adopt a Water Quality Control Plan or Basin Plan that recognizes and reflects the regional differences in existing water quality, the beneficial uses of the region's ground and surface water, and local water quality conditions and problems.

California Anti-Degradation Policy

The California Anti-Degradation Policy, otherwise known as the Statement of Policy with Respect to Maintaining High Quality Water in California, was adopted by the SWRCB in 1968. Unlike the Federal Anti-Degradation Policy, the California Anti-Degradation Policy applies to all waters of the state, not just surface waters. The policy states that whenever the existing quality of a water body is better than the quality established in individual Basin Plans, such high quality shall be maintained and discharges to that water body shall not unreasonably affect present or anticipated beneficial use of such water resource.

California Toxics Rule

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

California Water Plan

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

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

Sustainable Groundwater Management Act

On September 16, 2014, the State of California signed into law the Sustainable Groundwater Management Act (SGMA). Comprised of three bills, AB 1739, SB 1168, and SB 1319, the SGMA

provides a framework for long-term sustainable groundwater management across California and requires governments and water agencies of high and medium priority basins to halt overdraft and brings groundwater basins into balanced levels of pumping and recharge. Under the roadmap laid out by the legislation, local and regional authorities in medium and high priority groundwater basins have formed Groundwater Sustainability Agencies (GSA) that will oversee the preparation and implementation of a local Groundwater Sustainability Plan (GSP). Local stakeholders have until 2022 (in critically overdrafted basins until 2020) to develop, prepare, and begin implementation of GSPs. GSAs will have until 2042 (2040 in critically overdrafted basins) to achieve groundwater sustainability. The project site overlies a basin which is not designated as critically overdrafted and, as such, no GSA has been formed to develop a local GSP for its management yet.

County of Los Angeles Hydrology Manual

Pursuant to the City of Los Angeles (City) Special Order No. 007-1299, December 3, 1999, the City has adopted the Los Angeles County (County) *Department of Public Works Hydrology Manual* as its Conceptual Engineering Design for storm drainage facilities. The *Hydrology Manual* requires that a storm drain conveyance system be designed for a 25-year storm event and that the combined capacity of a storm drain and street flow system accommodate flow from a 50-year storm event. Areas with sump conditions are required to have a storm drain conveyance system capable of conveying flow from a 50-year storm event. The County also limits the allowable discharge into existing storm drain facilities based on the MS4 permit, which is enforced on all new developments that discharge directly into the County's storm drain system. Any proposed drainage improvements of County-owned storm drain facilities such as catch basins and storm drain lines require approval and/or review from the LACFCD.

Drainage and flood control structures and improvements within the City are subject to review and approval by the City's DPW, Bureau of Engineering, and Department of Building and Safety. As required by the DPW, all public storm facilities must be designed in conformity with the standards set forth by Los Angeles County. The DPW reviews and approves storm drain plans prior to construction. Any proposed increases in discharge directly into County facilities, or proposed improvements of County-owned storm drain facilities, such as catch basins and storm drain lines, require approval from County Flood Control to ensure compliance with the County's Municipal NPDES permit requirements.

County of Los Angeles Low Impact Development Manual

LID is a design strategy using naturalistic, on-site BMPs to lessen the impacts of development on stormwater quality and quantity. The goal of LID is to mimic the undeveloped runoff conditions of the development site with the post-development conditions. In 2014 the County of Los Angeles revised LID requirements for development occurring within unincorporated portions of the County.

The *LID Manual* explains how a site designer/engineer could use a wide array of simple cost-effective techniques that focus on site-level hydrologic control to meet LID regulations. The *LID Manual* describes those techniques, provides examples and descriptions of how they work, and contains BMP fact sheets.

Stormwater Pollution Prevention Program

For all construction activities disturbing more than one acre of land, California mandates the development and implementation of a Stormwater Pollution Prevention Program (SWPPP). The SWPPP documents the selection and implementation of BMPs (i.e., state-of-the-art control and treatment techniques for reducing environmental impacts) for a specific construction project. The SWPPP also charges property owners with stormwater quality management responsibilities. A construction site subject to the General Permit must prepare and implement the SWPPP that meets General Permit requirements.

The SWPPP is meant to identify potential sources and types of pollutants associated with construction activity and list BMPs that would prohibit pollutants from being discharged from the construction site into the public storm drain system. BMPs typically address stabilization of construction areas, minimization of erosion during construction, sediment control, control of pollutants from construction materials, and post-construction stormwater management (e.g., the minimization of impervious surfaces or treatment of stormwater runoff). The SWPPP is also required to include a discussion of the proposed program to inspect and maintain all BMPs.

Standard Urban Stormwater Mitigation Plan

A Municipal NPDES Permit was issued in December 2001 to Los Angeles County and 84 incorporated permittee cities within the County (Permittee). The permit defines the minimum required BMPs that must be adopted by Permittee municipalities and included by developers within plans for facility operations. To obtain coverage under this permit, a developer must obtain approval of a project-specific Standard Urban Stormwater Mitigation Plan (SUSMP) from the appropriate Permittee.

The SUSMP addresses the discharge of pollutants within stormwater generated following new construction or redevelopment. Under recent regulations adopted by the Los Angeles RWQCB, projects are required to implement an SUSMP during the operational life of a project to ensure that stormwater quantity and quality are addressed by incorporating BMPs into project design. This plan defines water quality design standards to ensure that stormwater runoff is managed for water quality concerns and to ensure that pollutants carried by stormwater are confined and not delivered to receiving waters. Applicants are required to abide by source control and treatment control BMPs from the list approved by the Los Angeles RWQCB and included in the SUSMP. These measures include infiltration of stormwater into the ground, as well as filtering

runoff before it leaves a site. This can be accomplished through various means, including the use of infiltration pits, flow-through planter boxes, hydrodynamic separators, and catch basin filters.

Los Angeles County MS4 Permit

Los Angeles RWQCB Order No. R4-2012-0175, NPDES No. CAS00400, effective December 28, 2012, Waste Discharge Requirements for Municipal Separate Storm Sewer System Discharges within the Coastal Watersheds of Los Angeles County (MS4 Permit), controls the quality of runoff entering municipal storm drains in the County. The requirements of Order No. R4-2012-0175 cover 84 cities and most of the unincorporated areas of Los Angeles County. LACFCD is designated as the Principal Permittee. The other permittees are the 84 Los Angeles County cities (including the City of Los Angeles) and Los Angeles County. Collectively, these are the "Co-Permittees." The MS4 Permit is intended to ensure that combinations of site planning, source control, and treatment control practices are implemented to protect the quality of receiving waters. To do so, the MS4 Permit requires that new development employ BMPs designed to control pollutants in stormwater runoff, details specific sizing criteria for BMPs, and specifies flow control requirements. These BMPs include structural practices, source control and treatment techniques and systems, and site design planning principles addressing water quality.

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

As required by the California Water Code, the Los Angeles RWQCB has adopted the "Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties" (Basin Plan). Specifically, the Basin Plan designates beneficial uses for surface and groundwaters, sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's anti-degradation policy, and describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Those of other agencies are referenced in appropriate sections throughout the Basin Plan. The Basin Plan is a resource for the Los Angeles RWQCB and others who use water and/or discharge wastewater in the Los Angeles region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

Local Regulations

City of Los Angeles Section 62.105, Construction "Class B" Permit

Any proposed drainage improvements within the street ROW or any other property owned by, to be owned by, or under the control of the City, requires the approval of a B-Permit (Section

62.105, Los Angeles Municipal Code [LAMC]). Under the B-Permit process, storm drain installation plans are subject to review and approval by the City of Los Angeles DPW, Bureau of Engineering (BOE). Additionally, any connections to the City's storm drain system from a property line to a catch basin or a storm drainpipe requires a storm drain permit from the BOE.

City of Los Angeles Section 64.70.01, Stormwater and Urban Runoff Pollution Control Ordinance

LAMC Section 64.70.01, the Stormwater and Urban Runoff Pollution Control Ordinance, was added by Ordinance No. 172,176 in 1998, and prohibits the discharge of unauthorized pollutants in the City. The Ordinance applies to all dischargers and places of discharge that discharge stormwater or non-stormwater into any storm drain system or receiving waters. While this practice is prohibited under the County's Municipal NPDES Permit, adoption of the Ordinance allows enforcement by DPW as well as the levy of fines for violations. The Ordinance prohibits the discharge of pollutants by persons operating or performing industrial or commercial activities into the storm drain system and receiving waters, except as authorized by a general or separate NPDES permit; defines illicit, exempt, and conditionally exempt discharges; prohibits the placement or discharge of trash, sewage, hazardous materials, and other waste in storm drains or receiving waters, or the accumulation, storage, or disposal of these materials in such a way as to contaminate runoff discharged to these facilities; requires control of pollutants from parking lots; and prohibits illicit connections to municipal storm drain facilities.

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

The Water Quality Compliance Master Plan for Urban Runoff (Water Quality Master Plan) was developed by the Bureau of Sanitation, Watershed Protection Division in collaboration with stakeholders in response to a 2007 City Council motion for the development of a water quality master plan addressing pollution from urban runoff within the City. The Water Quality Master Plan was adopted in April 2009.

The Water Quality Master Plan addresses planning, budgeting, and funding for achieving clean stormwater and urban runoff for the next 20 years and presents an overview of the status of urban runoff management within the City. The Water Quality Master Plan identifies the City's four watersheds, summarizes water quality conditions in the City's receiving waters as well as known sources of pollutants, summarizes regulatory requirements for water quality, describes BMPs required by the City for stormwater quality management, and discusses related plans for water quality that are implemented within the Los Angeles region, particularly TMDL Implementation Plans and Watershed Management Plans in Los Angeles.

County of Los Angeles Sedimentation Manual

The County of Los Angeles Sedimentation Manual (*Sedimentation Manual*) established LACDPW's sedimentation design criteria (LACDPW 2006b). The procedures and standards contained in the *Sedimentation Manual* were developed by LACDPW as the need arose to design erosion control structures, sediment retention structures, and channels carrying sediment laden flows. These sedimentation techniques are applicable in the design of local debris basins, storm drains, retention and detention basins, and channel projects within Los Angeles County.

Enhanced Watershed Management Program

The City of Santa Clarita, Los Angeles County, and LACFCD jointly developed an Enhanced Watershed Management Program (EWMP), which allows collaboration among agencies on multi-benefit regional projects to retain both non-stormwater and stormwater runoff, as well as to facilitate flood control and increase water supply. Nearly 90% of the Upper Santa Clara River Watershed (USCRW) is open space with approximately 88% being undeveloped land and contains one of the last remaining natural rivers in Southern California. The USCRW presents unique challenges for maintaining the balance of population growth, conservation of endangered species habitat, floodplain management, water supply, and wildlife corridors that depend on the Santa Clara River and its floodplain. The EWMP has been developed to protect these beneficial uses of the USCRW receiving waters, while recognizing these unique characteristics.

City of Santa Clarita Stormwater and Urban Runoff Pollution Control (SCMC Chapter 10.04)

Section 10.04.070 (Construction Activity Stormwater Measures) of Chapter 10.04 of the Santa Clarita Municipal Code (SCMC) identifies specific requirements related to water runoff and discharges during construction within the City.

City of Santa Clarita Floodplain Management Ordinance (SCMC Chapter 10.06)

The City of Santa Clarita participates in the National Flood Insurance Program (NFIP). The intention of the NFIP is to lessen the financial devastation caused by flooding in communities across the United States. It is a voluntary program based on a mutual agreement between the Federal Emergency Management Agency (FEMA) and the local community. Participation in the program makes federally backed flood insurance available to City residents and allows them to obtain direct federal relief following declared flood disasters (City of Santa Clarita 2020). In cooperation with FEMA, the City has adopted a Floodplain Management Ordinance (Chapter 10.06 of the SCMC), which governs development in the City's floodplains.

In order to remain an NFIP community, the City must regulate development in its flood hazard areas per the requirements of the Floodplain Management Ordinance along with other various technical documents published by FEMA.

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City of Santa Clarita Stormwater Mitigation Plan Implementation (SCMC Chapter 17.95)

Chapter 17.95 of the SCMC identifies certain requirements for post-construction stormwater activities for development projects to comply with the NPDES and MS4 permits. This chapter requires that each project develop and implement a mitigation plan to lessen the water quality impacts of development by using smart growth practices and BMPs that integrate LID design principles to mimic pre-development hydrology conditions through infiltration, evapotranspiration, rainfall harvest, and use.

Antelope Valley Integrated Water Management Plan

The Antelope Valley Integrated Water Management Plan includes a description of the region and participants, regional objectives and priorities, water management strategies, implementation, impacts and benefits, data management, financing, stakeholder involvement, relationships to local planning, and state and federal coordination.

Existing Conditions and Settings – Balboa Double Track Extension

The section below discusses the hydrology, drainage areas, and flood zones of the Balboa Double Track Extension site.

Hydrology Analysis

The Balboa Double Track Extension project site extends the existing double track approximately 6,300 feet north from Balboa Boulevard (Blvd.) to Sierra Highway (Hwy) (**Exhibit 1**). As shown in **Exhibit 2**, Balboa extends from the intersection at Balboa Road (Rd) northwest across Sierra Hwy. Based on LiDAR data (**Exhibit 3**), surface topography ranges from approximately 1,300 feet (ft) to 1,600 ft above mean sea level (msl). Drainage in the Balboa Double Track Extension site generally flows from north to south, running parallel to I-5. Based on the local Flood Insurance Rate Map (FIRM), most of the Balboa Double Track Extension site lies within Flood Zone D (Area of Undetermined Flood Hazard) with small areas that fall in Flood Zones AE (1% chance of flooding) and X (0.2 % chance of flooding) (**Exhibit 4**). The land use of Balboa is categorized as low-density development surrounded by roadways and undeveloped land (**Exhibit 5**). The land use comes from raster data from the Multi-Resolution Land Characteristics (MLRC) consortium. It is a group of several federal agencies who generate relevant land cover information.

Drainage Area

Following a process of subcatchment delineation, seven discharge locations were observed from the field assessment, review of the Conceptual Engineering Design (CED), and Google Earth aerial reconnaissance. No locations show signs of sheet flow erosion or obstructions. Sheet

flow from the drainage areas discharge to the concrete channel. **Exhibit 6** highlights all Balboa Double Track Extension drainage area (DA) locations.

Hydrologic Parameters

Soil types for each drainage area were determined from the LA County Hydrology Map. The Balboa Double Track Extension site contains soil types 63 and 64 which are called "UPPER LOS ANGELES RIVER" in Appendix C of the *Los Angeles County Hydrology Manual (LACHM)*. **Exhibit 7** shows the soil types for the Balboa Double Track Extension site.

Tables 1 shows subcatchment hydrologic inputs for existing conditions analysis. Area, impervious cover, flow path length, and flow path slope were determined from aerial and GIS data.

Table 1: Existing Conditions Hydrology Parameters – Balboa Double Track Extension

Drainage Area	Area (ac)	Impervious Cover (0.01-1.0)	Flow Path Length (ft)	Flow Path Slope (vft/hft)	Soil Type	Fire Factor
DA-01	86.9	0.32	3,872	0.027	63	0
DA-02	687.4	0.04	15,134	0.024	64	0
DA-03	246.8	0.04	12,463	0.028	64	0
DA-04	752.9	0.28	10,473	0.021	64	0
DA-05	33.5	0.96	2,625	0.022	64	0
DA-06	175.6	0.08	7,107	0.035	64	0
DA-07	25.4	0.68	2,148	0.039	63	0

Modeling Results

Peak flows for existing conditions for the Balboa Double Track Extension sites are displayed in **Table 2**. Existing peak flow hydrographs are shown in **Figures 5**. Balboa Double Track Extension site proposed conditions peak flows show increases over existing conditions for all storm events (**Table 3**). Proposed conditions are discussed further in the Impacts section of the memo.

Table 2: Existing Conditions Peak Flow – Balboa Double Track Extension

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	34	60	82	120	148	180	200
DA-02	260	493	655	860	1,019	1,169	1,258

Water Resources and Hydrology Technical Memo

Antelope Valley Line Capacity and Service Improvements Program

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-03	94	177	235	309	366	420	452
DA-04	347	605	782	1,006	1,178	1,343	1,439
DA-05	24	41	54	71	86	100	106
DA-06	69	129	170	222	273	334	368
DA-07	15	29	39	54	65	77	87

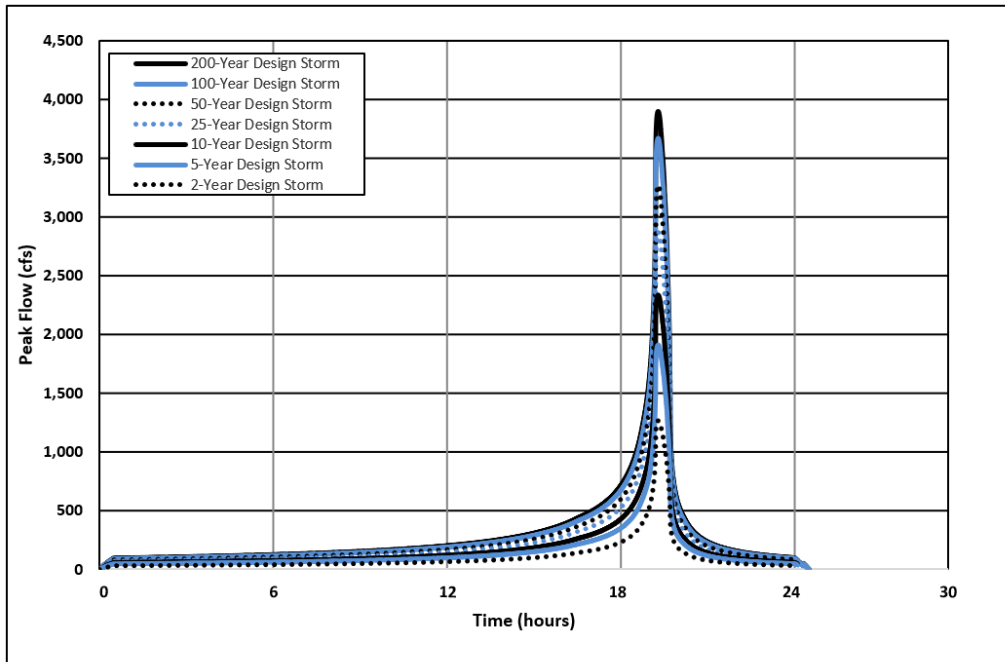


Figure 5: Existing Balboa Double Track Extension site peak flow hydrograph for two-, five-, 10-, 25-, 50-, 100-, and 200-year design storms

Table 3: Change in Peak Flow from Existing to Proposed Condition – Balboa Double Track Extension

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	1	1	1	1	6	7	8
DA-02	0	0	0	0	0	0	0

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-03	0	0	0	0	0	0	0
DA-04	1	1	1	1	1	1	1
DA-05	0	0	0	0	0	0	0
DA-06	0	0	0	0	0	0	0
DA-07	3	3	4	2	2	2	2

Modeling results hydrographs visually confirm that there is minimal difference between existing and proposed conditions cumulative peak flows. **Figure 6** shows the difference in Balboa Double Track Extension site peak flows for the two-year design storm event, while **Figure 7** shows the difference in peak flows for the 100-year design storm event.

Additionally, the shapes of the proposed conditions runoff hydrographs for the Balboa Double Track Extension site match the shapes of the existing conditions runoff hydrographs. This indicates there is minimal increase in runoff volume as shown by the area under the hydrograph.

Appendix B includes additional details on results including HydroCalc inputs and resulting hydrographs for individual drainage areas directly out of HydroCalc.

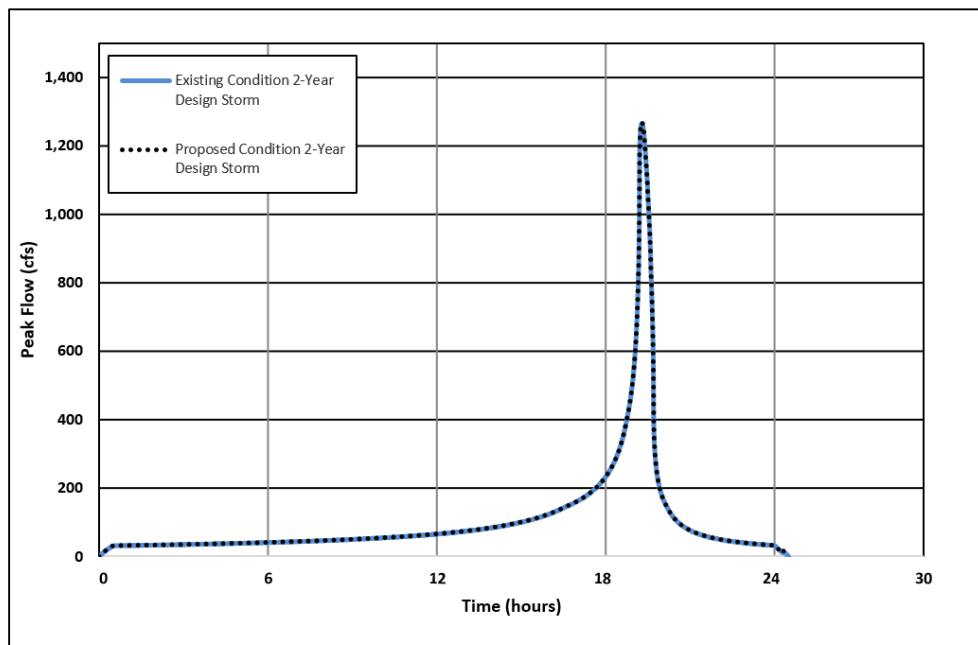


Figure 6: Balboa Double Track Extension site two-year storm event cumulative hydrograph peak flow comparison

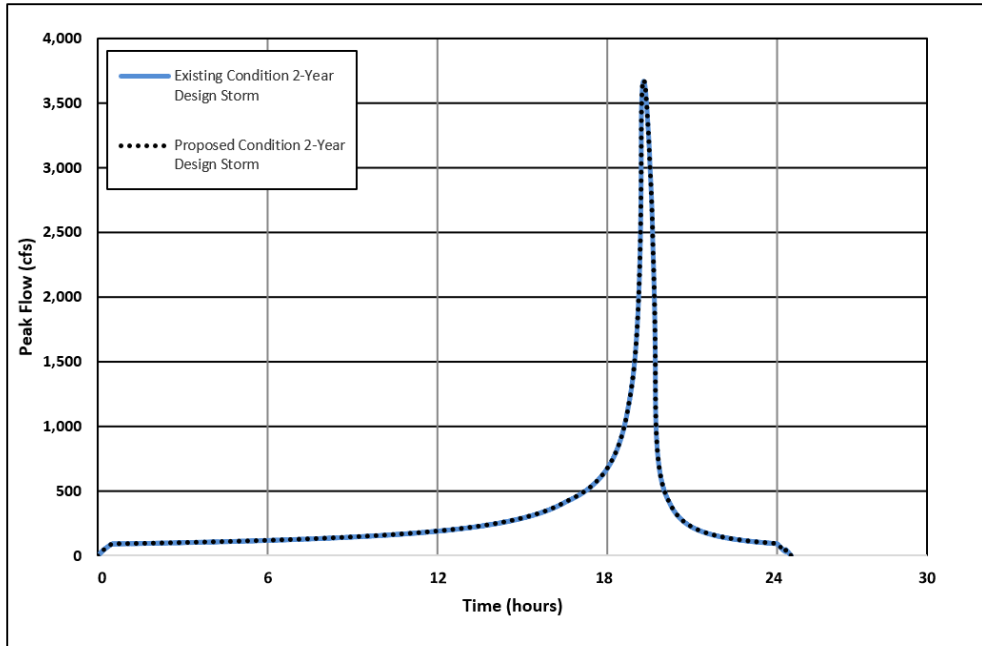


Figure 7: Balboa Double Track Extension site 100-year storm event cumulative hydrograph peak flow comparison

Existing Conditions and Settings – Canyon Siding Extension

The section below discusses the hydrology, drainage areas, and flood zones of Canyon Siding Extension site.

Hydrology Analysis

The Canyon Siding Extension project site improvement project adds approximately 8,400 ft of new double track between Soledad Canyon Rd to Golden Oak Rd and would also provide a second station platform at the existing Santa Clarita Metrolink station (**Exhibit 8**). **Exhibit 9** shows how the Canyon Siding Extension site extends from the foothills and runs parallel to Soledad Canyon Rd. Based on LiDAR data shown in **Exhibit 10**, surface topography ranges from approximately 1,200 ft to 1,300 ft above msl. Drainage in this capital improvement site flows in an east-to-west direction. Based on the local FIRM, all of the Canyon Siding Extension site lies within the 0.2% recurrence interval Flood Zone X (**Exhibit 11**). **Exhibit 12** displays the site land use which is categorized as medium density development surrounded by patches of developed land.

Drainage Area

Based on field reconnaissance and desktop analysis using topographic DEMs three subcatchments (drainage area) were delineated to define drainage patterns, with drainage areas ranging from 18 ac to 793 ac. There are no changes or obstructions to sheet flow drainage flowing from upstream of the ROW. Sheet flow drains away from developed areas to isolated parking lot areas. **Figure 8** shows the on-site and off-site sheet flow drainage discharge point. **Figure 9** illustrates DA1 and DA2 drainage discharging into the receiving stream. **Exhibit 13** highlights all Canyon Siding Extension site drainage area locations.



Figure 8: Canyon Siding Extension site sheet flow discharge location from all DAs



Figure 9: Canyon Siding Extension site DA2 drainage discharge location

Hydrologic Parameters

Soil types for each drainage area were determined from the LA County Hydrology Map. The Canyon Siding Extension site contains only soil type 97 which is called "SANTA CLARA RIVER" in Appendix C of the LACHM. **Exhibit 14** shows the soil type for the Canyon Siding Extension site.

Table 4 shows subcatchment hydrologic inputs for existing conditions analysis. Area, impervious cover, flow path length, and flow path slope were determined from aerial and GIS data.

Table 4: Existing Conditions Hydrology Parameters – Canyon Siding Extension

Drainage Area	Area (ac)	Impervious Cover (0.01-1.0)	Flow Path Length (ft)	Flow Path Slope (vft/hft)	Soil Type	Fire Factor
DA-01	18.2	0.45	2,000	0.051	97	0
DA-02	20.0	0.19	1,989	0.073	97	0
DA-03	794.0	0.64	16,524	0.018	97	0

Modeling Results

Peak flows for existing conditions for the Canyon Siding Extension site are displayed in **Table 5**. Existing peak flow hydrographs are shown in **Figure 10** and two- to 100-year event hydrographs in **Figures 11** and **12**. Canyon Siding Extension site proposed conditions peak flows show

increases over existing conditions for all storm events (**Table 6**). Proposed conditions are discussed further in the Impacts section of the memo.

Table 5: Existing Conditions Peak Flow – Canyon Siding Extension

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	9	17	24	33	40	48	51
DA-02	7	17	24	34	42	50	56
DA-03	402	640	799	1,004	1,156	1,311	1,398

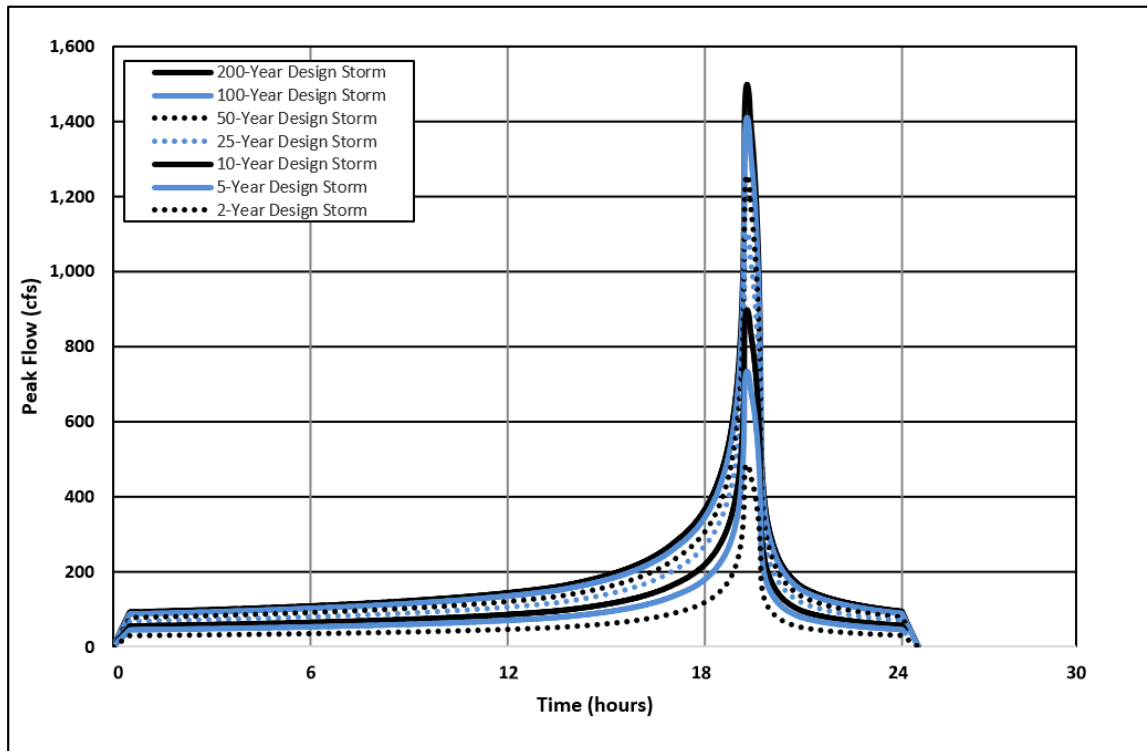


Figure 10: Existing Canyon Siding Extension site peak flow hydrograph for two-, five-, 10-, 25-, 50-, 100-, and 200-year design storms

Table 6: Change in Peak Flow from Existing to Proposed Condition – Canyon Siding Extension

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	0	0	0	0	0	0	0
DA-02	0	0	0	0	0	0	0
DA-03	20	23	25	26	27	28	28

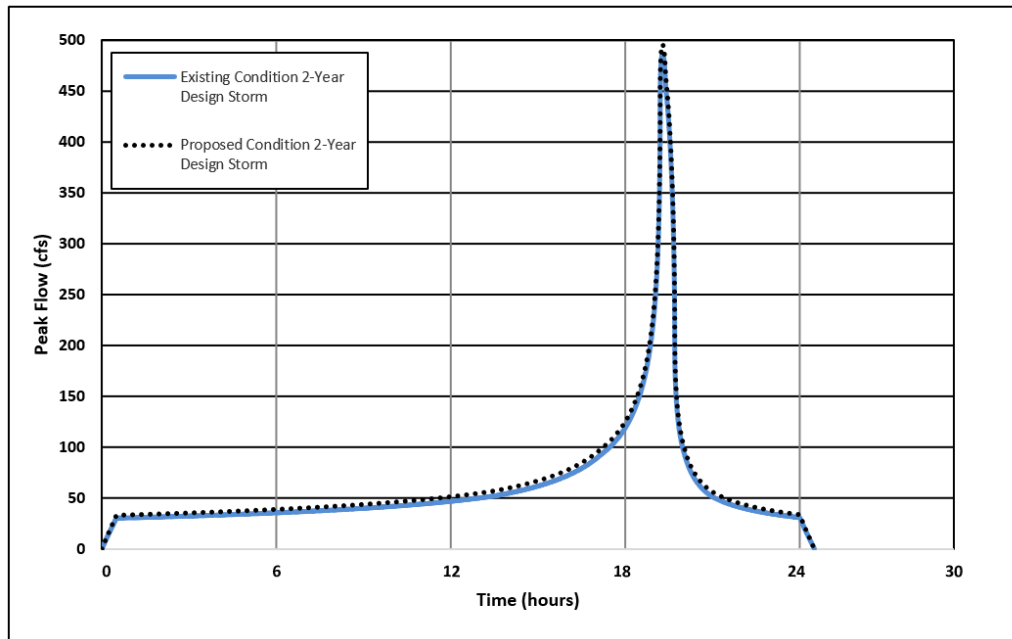


Figure 11: Canyon Siding Extension site two-year storm event cumulative hydrograph peak flow comparison

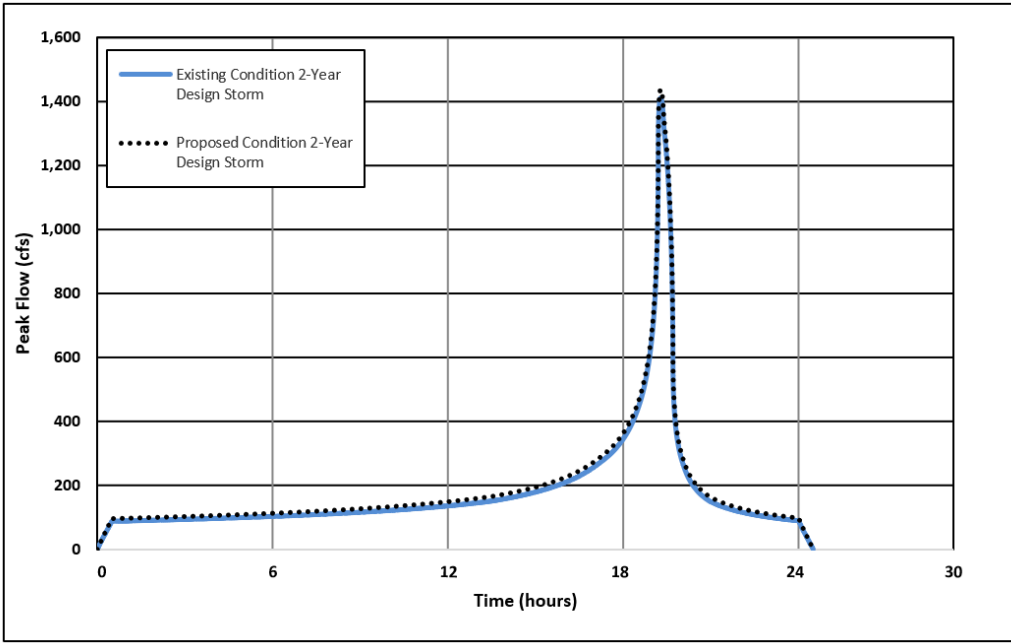


Figure 12: Canyon Siding Extension site 100-year storm event cumulative hydrograph peak flow comparison

Existing Conditions and Settings – Lancaster Terminal Improvements

The section below discusses the hydrology, drainage areas, and flood zones of the Lancaster Terminal Improvements site.

Hydrology Analysis

The Lancaster Terminal Improvements site expands the existing yard with two new 1,000-foot-long train storage tracks and a second station platform at Lancaster Metrolink Station including double tracking between W Avenue to Jackman Street (**Exhibit 15**). The Lancaster Terminal Improvements site will run parallel to Sierra Hwy until the intersection at W Avenue (**Exhibit 16**). Based on LiDAR data shown in **Exhibit 17**, surface topography ranges from approximately 2,335 ft to 2,360 ft above msl. Drainage in the Lancaster Terminal Improvements site flows from south to north alongside Sierra Hwy. Based on the local FIRM, all the site lies within the 0.2% recurrence interval Flood Zone X (**Exhibit 18**). The site is located in an urbanized setting and land use is categorized as medium density development (**Exhibit 19**).

The Lancaster Terminal Improvements site is in the Antelope River-Fremont Valleys Basin of the Armargosa Creek Tributary River where it runs northwest. Improvements in this project are along the Southern Pacific RR. The streams in this capital improvement site are intermittent meaning they have full streams in wet weather.

Drainage Area

The Lancaster Terminal Improvements site is a flat developed area that runs parallel to Armargosa Creek tributary. A field evaluation and DEM aerial image drainage pattern review were used to delineate 35-acre and 260-acre subcatchments (drainage areas). Many streams are present along roads due to the flat gradient. Sheet flow drains from south to north along railroad sides with no observed obstructions until discharging into the receiving waters. **Figure 13** shows the development layout. **Figure 14** illustrates the project area and sheet flow drainage being far from the railroad. **Exhibit 20** highlights all Lancaster Terminal Improvements site drainage locations.



Figure 13: Lancaster Terminal Improvements site area and railroad

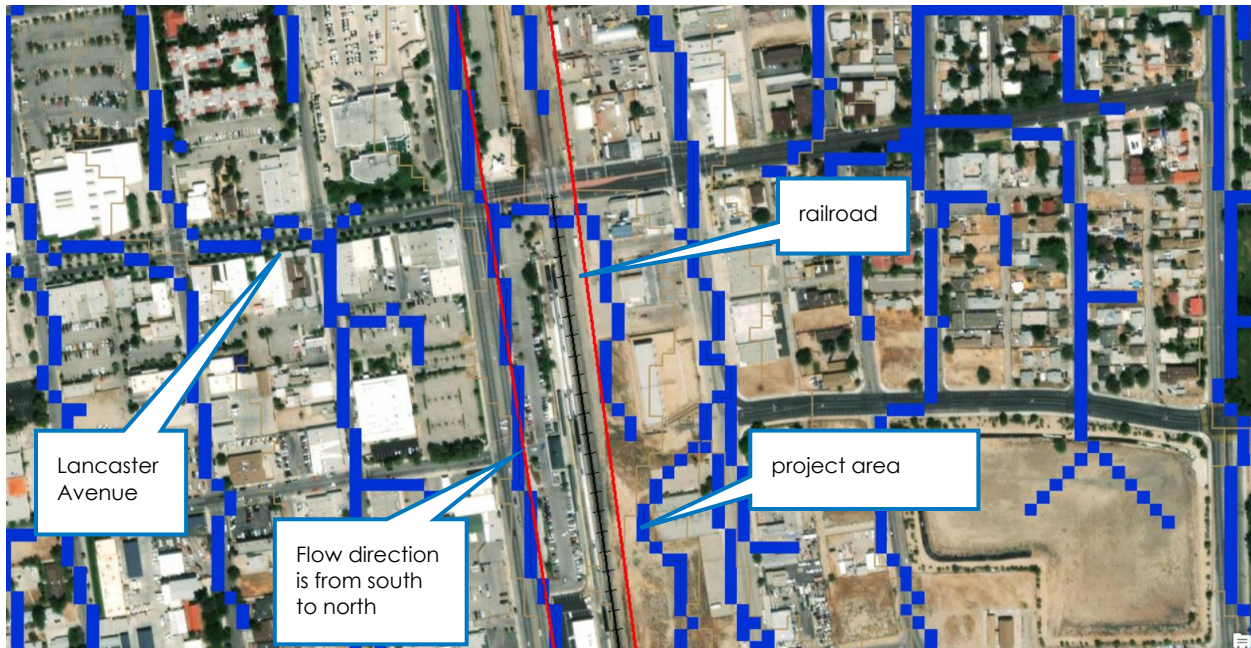


Figure 14: Lancaster Terminal Improvements project area, railroad, and streams

Hydrologic Parameters

Soil types for each drainage area were determined from the LA County Hydrology Map. The Lancaster Terminal Improvements site contains soil types 120 and 124 which are called “ANTELOPE VALLEY” in Appendix C of the LACHM.

Table 7 shows subcatchment hydrologic inputs for existing conditions analysis. Area, impervious cover, flow path length, and flow path slope were determined from aerial and GIS data.

Table 7: Existing Conditions Hydrology Parameters – Lancaster Terminal Improvements

Drainage Area	Area (ac)	Impervious Cover (0.01-1.0)	Flow Path Length (ft)	Flow Path Slope (vft/hft)	Soil Type	Fire Factor
DA-01	35.0	1.00	8,700	0.0062	124	0
DA-02	260.1	0.82	16,000	0.0059	120	0

Modeling Results

Peak flows for existing conditions for the Lancaster Terminal Improvement site are displayed in **Table 8** while **Table 9** shows the changes in peak flows from existing to proposed conditions. Existing peak flow hydrographs are shown in **Figure 15**. The Lancaster Terminal Improvements site shows no increases in peak flows for all storm events. Proposed conditions are discussed further in the Impacts section of the memo.

Table 8: Existing Conditions Peak Flow – Lancaster Terminal Improvements

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	9	13	16	20	22	25	27
DA-02	55	83	101	124	143	163	174

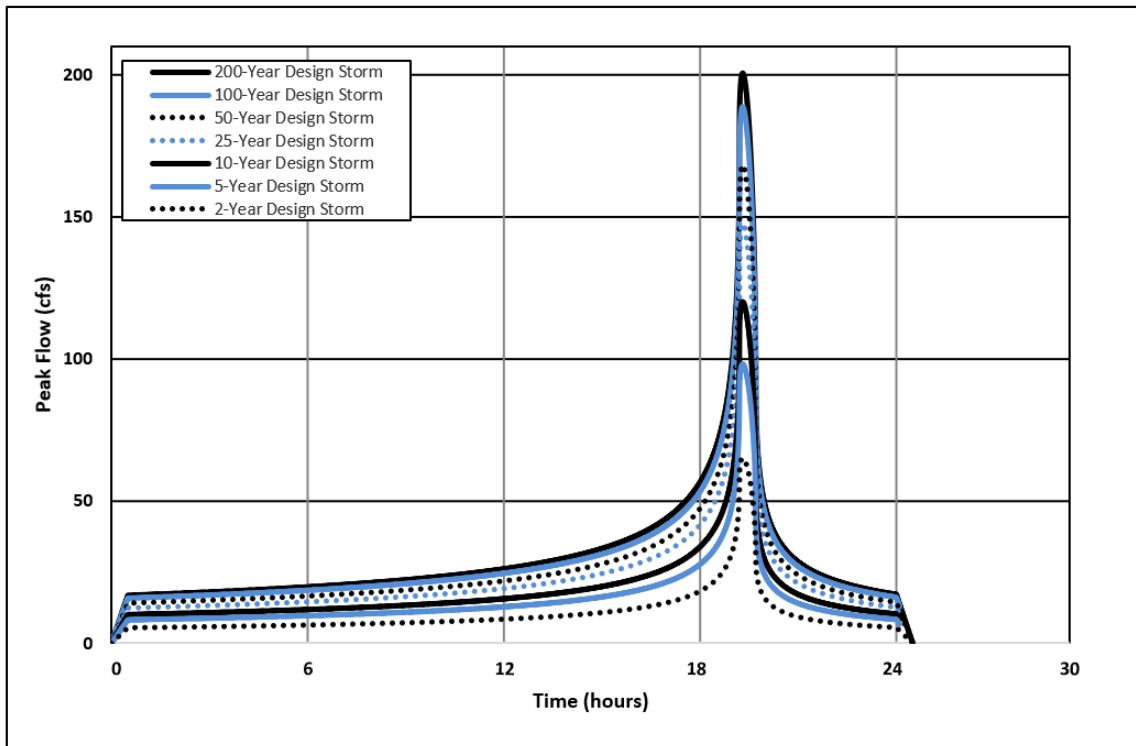


Figure 15: Existing Lancaster Terminal Improvements site peak flow hydrograph for two-, five-, 10-, 25-, 50-, 100-, and 200-year design storms

Table 9: Change in Peak Flow from Existing to Proposed Condition – Lancaster Terminal Improvements

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	0	0	0	0	0	0	0
DA-02	0	0	0	0	0	0	0

Figures 16 and 17 show the difference in Lancaster Terminal Improvements site peak flows for the two- and 100-year design storm events.

As illustrated by the hydrographs, proposed conditions peak runoffs for the Lancaster Terminal Improvements site remain the same compared to existing conditions for all events. Appendix B includes additional details on results including HydroCalc inputs and resulting hydrographs for individual drainage areas directly out of HydroCalc.

Note that HydroCalc does not have an option to run the 200-year event. To simulate the 200-year event, the multiplication factor extrapolated from Table 5.3.1 of the LACHM was applied to the 50-year event and then ran as a 50-year event.

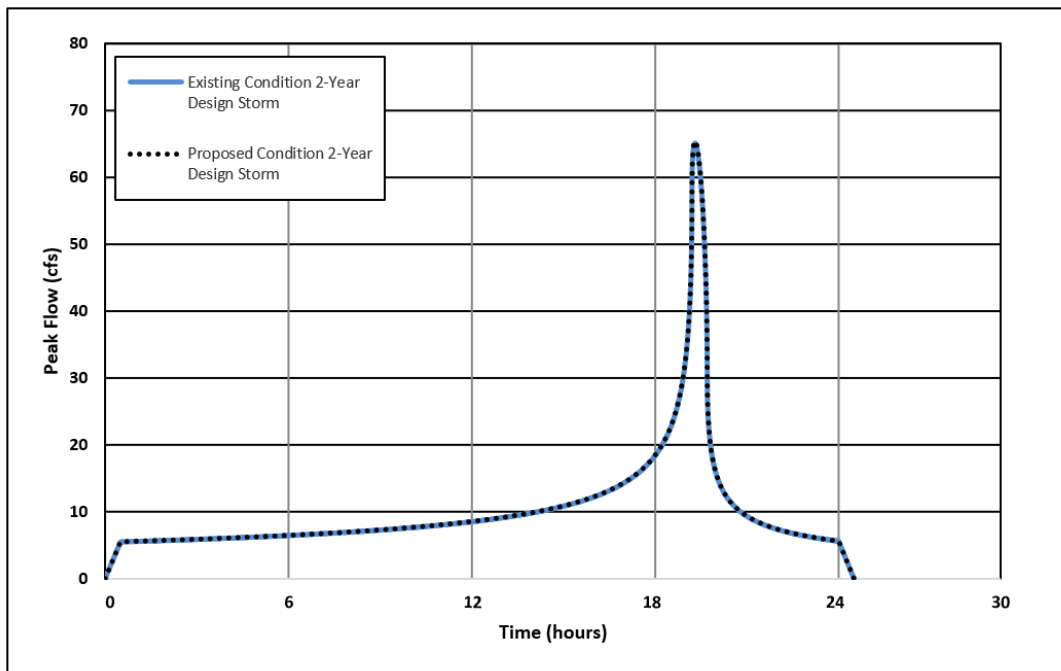


Figure 17: Lancaster Terminal Improvements site two-year storm event cumulative hydrograph peak flow comparison

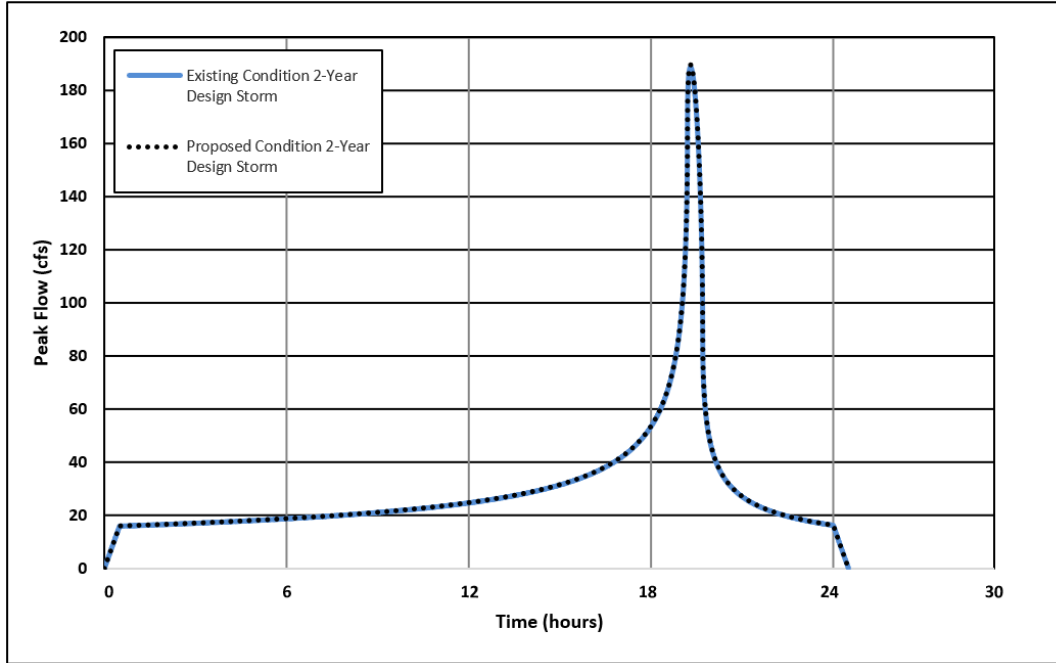


Figure 18: Lancaster Terminal Improvements site 100-year storm event cumulative hydrograph peak flow comparison

Assessment of LID

The three capital improvement sites are all considered “non-designated projects” as they do not meet any of the criteria set forth by the County of Los Angeles DPW *LID Manual 2014*. There is more than one acre of disturbed land at all three capital improvement sites, but each site does not add more than 10,000 square feet (sq-ft) of impervious surface area. Accordingly, the capital improvement sites do not require retention-based stormwater quality control measures.

Methodology

The following describes the methods for impact evaluation:

Mapping of water features

DEM satellite imagery was downloaded from the USDA and processed using Arc Hydro 10.8 to generate drainage areas and stream locations. ArcGIS was used to calculate other hydrologic parameters including drainage areas soil types, impervious cover, slopes, and longest flow paths. Seven subcatchments (drainage area) were defined for the Balboa site, with drainage areas ranging from 25 acre (ac) to 753 ac. The storm drainage system in this area is complex; it has a network of roads such as I-5, developments, storage space, and parking lots.

Application of engineering concepts

Modeling was performed per the January 2006 *LACHM*. The modified rational method (MODRAT) is the standard method for hydrologic studies within the county. MODRAT applies a time of concentration (TC) to each design storm to determine rainfall intensities, which are used to obtain soil runoff coefficients. The rational formula then provides a flow rate for a specific time. Plotting the time specific flow rate yields a hydrograph and an associated flow volume for each subcatchment.

Calculation of event storms

Per the *LACHM*, approved modeling software must be used that can run MODRAT. As such, the three capital improvement sites were modeled in HydroCalc version 1.0.3. All rainfall data was obtained from the LA County Hydrology Map. The *LACHM* requires that the 50-year event be used to calculate the two-, 10-, 25-, 100-, and 200-year events by using a 50-year event multiplication factor. See **Appendix A** for rainfall data for the three capital improvement sites.

Selection of hydraulic parameters

MODRAT requires assigning a single soil type for each subarea modeled. If a subarea contains more than one soil type, the predominant soil type in the subarea is used. The model then uses a runoff coefficient curve associated with that soil type number (179 total soil types in all) to model the runoff response of the soil to the changing intensity of rainfall.

Thresholds and Impacts

This section provides an impact analysis to address the following concerns, limited to Watearth's scope of work as shown in the analysis above. As a result, Threshold B (groundwater) is not included.

Impact A

Would the Proposed Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Construction

The Proposed Project would be entirely constructed within existing LA Metro ROW for all three capital improvement sites. Minor acquisitions, easements, or temporary construction easements may be necessary at select locations to accommodate construction staging, laydown areas, and required grading activities associated with the proposed capital improvements. Generally, construction activities associated with each capital improvement would include site clearing, grading, and retaining wall installation, utility relocation and installation, and track and systems installation. Station platforms proposed as part of the Canyon Siding Extension and Lancaster

Terminal Improvements sites would require cast in-place concrete slabs and foundations as well as installation of typical station platform elements such as canopies and seating.

Construction equipment anticipated to be used for the Proposed Project include track installation equipment, front-end loaders, dump and haul trucks, excavators, medium to large rams for breaking rock, small/medium scrapers, drills for tiebacks/rock bolts, construction forklifts, cranes, concrete pump trucks, concrete haul trucks, rail-mounted drill rigs for pier protection wall installation, and utility/service vehicles. Additional smaller equipment may also be used such as walk-behind compactors, compact excavators and tractors, and small hydraulic equipment. The construction duration of the Proposed Project is expected to last approximately 24 months at each of the three capital improvement sites. Water usage as part of construction would be limited such that groundwater supplies would not be affected.

Outfalls were identified at all three capital improvement sites. The Balboa Double Track Extension site has seven discharges into an existing drainage channel, there are two outfalls into Castaic Creek/Santa Clara River at the Canyon Siding Extension site, and sheet flow runs off of the Lancaster Terminal Improvements site to the north. Stormwater would be managed according to the SWPPP written by a Qualified SWPPP Developer, and monitored until final stabilization of the capital improvement sites. In addition, the capital improvement sites would be subject to all aspects of the California Construction General Permit for stormwater. Therefore, construction water use for the Proposed Project would not result in a significant impact.

In addition, the general contractor should prepare an SWPPP for the Proposed Project, which shall prescribe sediment runoff controls, hazardous materials handling procedures for reducing potential spills during construction, and an emergency response program to ensure quick and safe cleanup of accidental spills. Additionally, an environmental training program shall be established to communicate environmental concerns and appropriate work practices, including spill prevention, response measures, and SWPPP measures to all field personnel. Further, a monitoring program shall be implemented to ensure that the plans are followed during all construction, operations, and maintenance activities. This would ensure that impacts are minimized as related to water contaminants.

Operation

No aspect of the Proposed Project activities described above in the project description could affect water usage or water quality. Addition of a new double track extension will increase the peak flow only 0.3 %, resulting in no potential hydrologic hydromodification impacts. In addition, the project's SWPPP would incorporate any long-term BMPs that could be required for soil stabilization for long-term project operations. Impacts would be less than significant with incorporation of the following SWPPP mitigation measures.

The post-construction drainage system does not include any BMPs or LID features. As runoff will only marginally increase as described above, and now significant land use changes are proposed, impacts would be less than significant with incorporation of the following mitigation measure. See the table below for proposed conditions related to hydrology parameters at the Balboa Double Track Extension site during long-term operations.

Proposed Conditions - Balboa Double Track Extension

Improvements at the Balboa Double Track Extension site are kept inside the ROW while field reconnaissance photos are displayed in **Figure 19** and **Figure 20**. Google Earth images are exhibited in **Figures 21** and **22** and hydrologic maps in **Figure 23**. From the above, the proposed double track extension will change the extent of the existing rail track by a minimum of 30 feet which adds additional impervious area along the project area. In LA Metro's Composite Utility Rearrangement Plan (CURP), we noted some improvements to the existing outfalls (culvert).



Figure 19: Balboa Double Track Extension site upstream view



Figure 20: Balboa Double Track Extension site downstream view



Figure 21: Balboa Double Track Extension site upstream view



Figure 22: Balboa Double Track Extension site downstream view

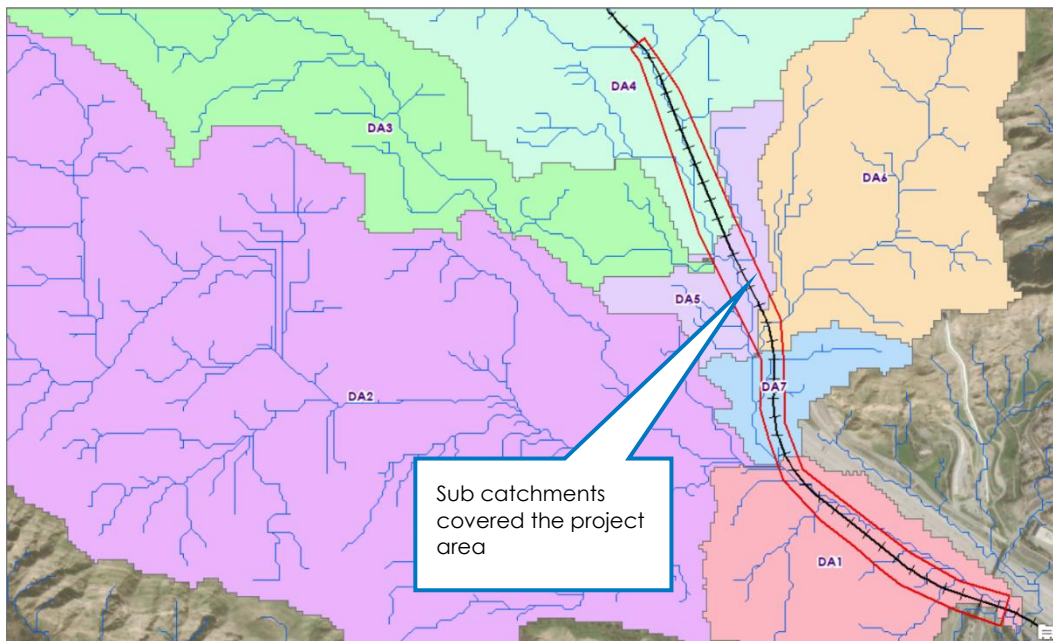


Figure 23: Balboa Double Track Extension site subcatchment areas

After a desktop assessment of CED there is no evidence of construction activities that would block or lead to changes in flow patterns. Further, on-site sheet flow draining down the ROW will follow the existing conditions pattern, and there will be no changes to existing conditions subcatchment hydrologic parameters except for minor impervious cover adjustments.

Table 10 shows the hydrologic inputs for the proposed conditions model. Area, impervious cover, flow path length, and flow path slope were determined from aerial and GIS data. Proposed peak flows for Balboa Double Track Extension are displayed in **Table 11** and **Figure 24**.

Table 10: Proposed Conditions Hydrology Parameters - Balboa Double Track Extension

Drainage Area	Area (ac)	Impervious Cover (0.01-1.0)	Flow Path Length (ft)	Flow Path Slope (vft/hft)	Soil Type	Fire Factor
DA-01	86.9	0.35	3,872	0.027	63	0
DA-02	687.4	0.04	15,134	0.024	64	0
DA-03	246.8	0.04	12,463	0.028	64	0
DA-04	752.9	0.28	10,473	0.021	64	0
DA-05	33.5	0.99	2,625	0.022	64	0
DA-06	175.6	0.08	7,107	0.035	64	0
DA-07	25.4	0.72	2,148	0.039	63	0

Table 11: Proposed Conditions Peak Flow – Balboa Double Track Extension

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	35	61	83	121	153	187	208
DA-02	260	493	655	860	1,019	1,169	1,258
DA-03	94	177	235	309	366	420	452
DA-04	347	605	782	1,006	1,179	1,343	1,440
DA-05	24	42	55	71	86	100	107
DA-06	69	129	170	222	273	334	368
DA-07	18	32	43	57	68	80	89

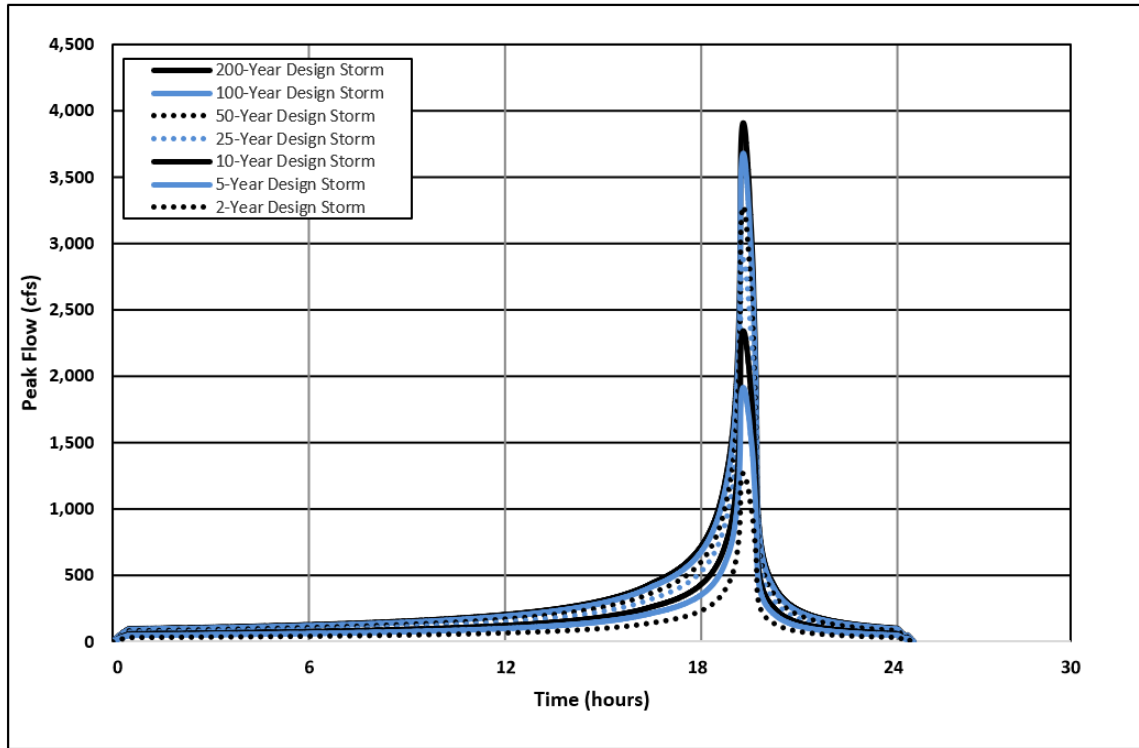


Figure 24: Proposed Balboa Double Track Extension peak flow hydrograph for two-, five-, 10-, 25-, 50-, 100-, and 200-year design storms

Proposed Conditions - Canyon Siding Extension

From field reconnaissance and desktop analysis, the improvements in Canyon are kept inside the ROW. The proposed rail bed extension would be extended at least 30 feet plus some additional grading of existing slopes. Finally, the Project Area is completely inside the three drainage areas (**Figure 25**). In the CURP, some culvert improvements to the existing storm drain run through the Site.

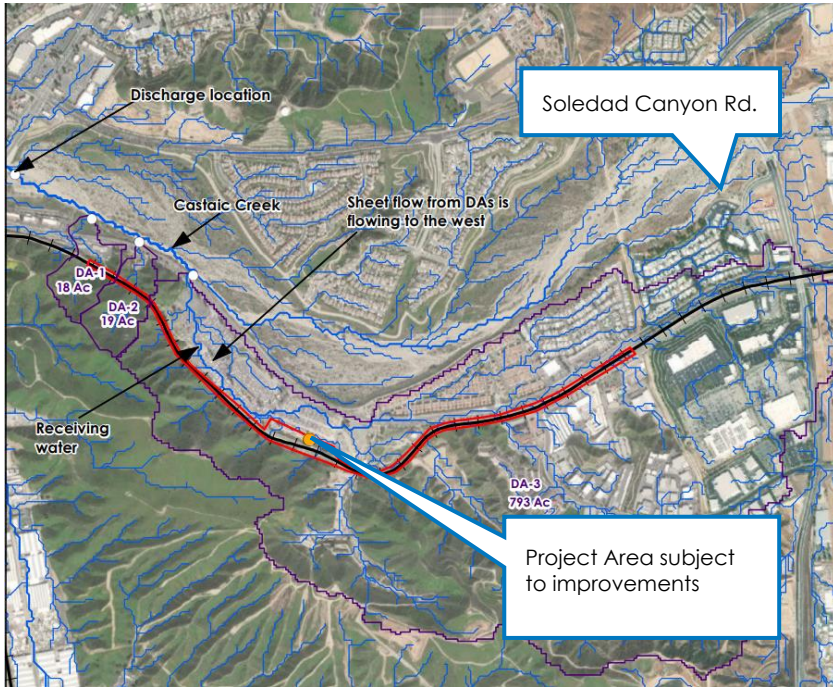


Figure 25: Canyon Siding Extension site drainage patterns and streams

After a desktop assessment of CED, there is no evidence of construction activities that will block sheet flow or cause changes in drainage patterns. Further, on-site sheet flow draining down the ROW will follow the existing conditions pattern, and there will be no changes to existing conditions subcatchment hydrologic parameters except for minor impervious cover adjustments.

Table 12 shows the hydrologic inputs for the proposed conditions model. Area, impervious cover, flow path length, and flow path slope were determined from aerial and GIS data. **Table 13** and **Figure 26** explore proposed peak flows for the Canyon Siding Extension site.

Table 12: Proposed Conditions Hydrology Parameters – Canyon Siding Extension

Drainage Area	Area (ac)	Impervious Cover (0.01-1.0)	Flow Path Length (ft)	Flow Path Slope (vft/hft)	Soil Type	Fire Factor
DA-01	18.2	0.45	2,000	0.051	97	0
DA-02	20.0	0.20	1,989	0.073	97	0
DA-03	794.0	0.72	16,524	0.018	97	0

Table 13: Proposed Conditions Peak Flow – Canyon Siding Extension

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	9	17	24	34	40	48	51
DA-02	7	17	24	34	42	50	56
DA-03	422	664	824	1,030	1,183	1,339	1,427

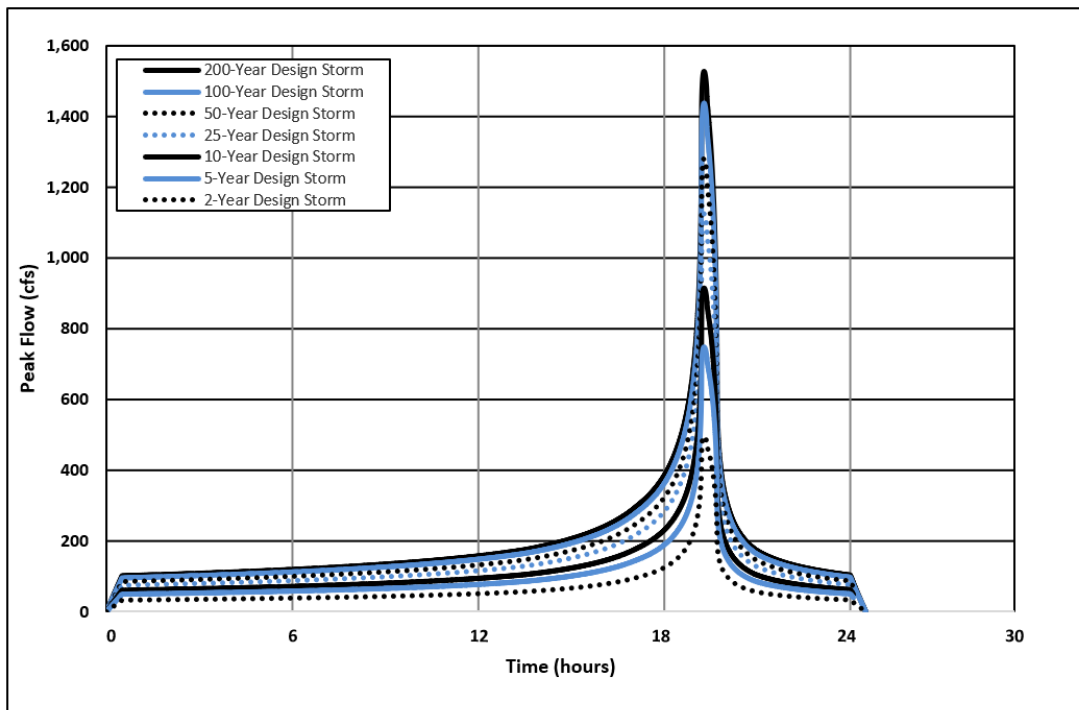


Figure 26: Proposed Canyon Siding Extension site peak flow hydrograph for two-, five-, 10-, 25-, 50-, 100-, and 200-year design storms

Proposed Conditions - Lancaster Terminal Improvements

From field reconnaissance and desktop analysis, the improvements in the Lancaster Terminal Improvements site are kept inside the ROW, while field reconnaissance photos are shown in **Figure 27** and **Figure 28**. In the CURP, we also noted some existing and proposed storm drainage.

Field reconnaissance observed no significant grade changes. Inlets were observed throughout existing station parking lot. Parking spaces closest to Sierra Hwy are lower in elevation than the station platform and track. Sheet flow has a natural path to the north based on elevation differences.



Figure 17: Lancaster Terminal Improvements site - inlet



Figure 28: Lancaster Terminal Improvements inlet - inlet

Based on the desktop analysis, there are no changes in flow pattern due to construction activities since the sheet flow will continue draining from south to north until it reaches the receiving water. Thus, except for minor changes in impervious cover, subcatchment hydrologic parameters will be the same as existing conditions.

Table 14 shows the hydrologic inputs for the proposed conditions model. Area, impervious cover, flow path length, and flow path slope were determined from aerial and GIS data. **Table 15** and **Figure 29** illustrate proposed peak flows for Lancaster Terminal Improvements.

Table 14: Proposed Conditions Hydrology Parameters – Lancaster Terminal Improvements

Drainage Area	Area (ac)	Impervious Cover (0.01-1.0)	Flow Path Length (ft)	Flow Path Slope (vft/hft)	Soil Type	Fire Factor
DA-01	35.0	1.00	8,700	0.0062	124	0
DA-02	260.1	0.82	16,000	0.0059	120	0

Table 15: Proposed Conditions Peak Flow – Lancaster Terminal Improvements

Drainage Area	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
DA-01	9	13	16	20	23	25	27
DA-02	55	83	101	125	143	163	174

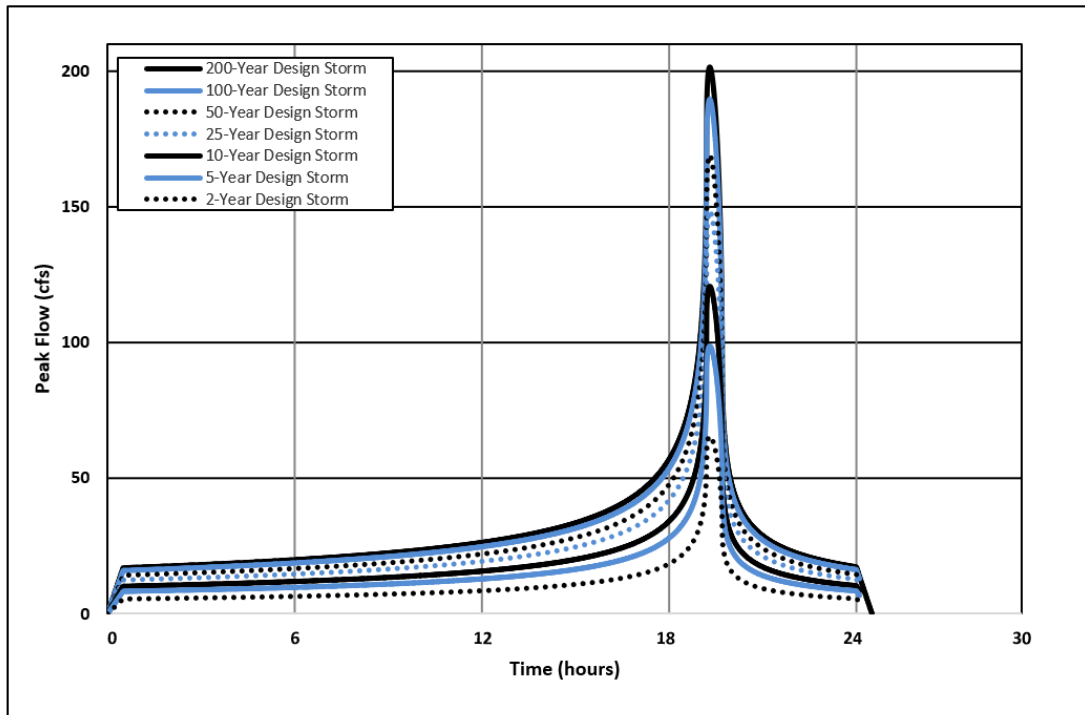


Figure 29: Proposed Lancaster Terminal Improvements site peak flow hydrograph for two-, five-, 10-, 25-, 50-, 100-, and 200-year design storms

Impact C

Would the Proposed Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

1. result in substantial erosion or siltation on- or off-site;
2. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
3. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
4. impede or redirect flood flows?

Hydrology - Balboa Double Track Extension

The hydrologic approach to assess potential hydromodification is to compare cumulative existing and proposed hydrographs and peak flows for all storm events at the receiving stream.

Exhibit 21 displays the reach of stream downstream from the project site that was evaluated for hydromodification that has not been disturbed by prior construction activities as well as the analysis point. The receiving stream and analysis point for the entire watershed is at Balboa Blvd.

Table 16 shows the difference in cumulative peak flows at Balboa Blvd for all design storm events over the watershed. As previously discussed, there are slight differences in impervious cover between the existing and proposed conditions. However, since all other hydrologic parameters remain constant there is no increases in peak discharges, thereby indicating low hydromodification potential. **Figure 30** shows cumulative hydrographs for the watershed for the two-, five-, and 10-year design storm events.

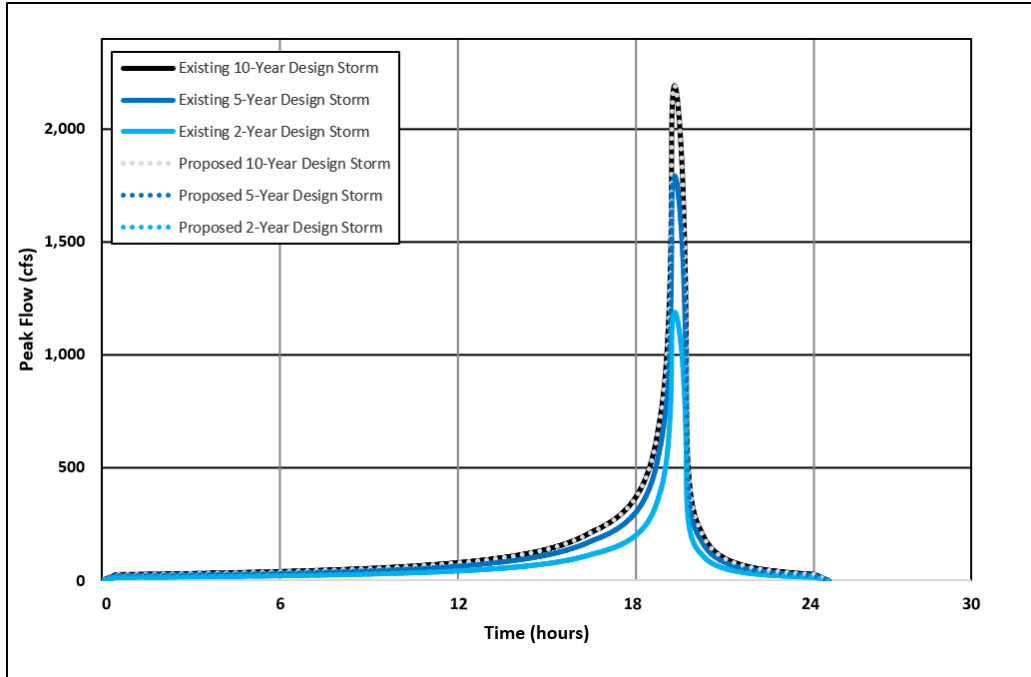


Figure 30: Balboa Double Track Extension site comparison of cumulative hydrographs and peak flows for the two-year, five-year, and 10-year design storm events

Table 16: Change in Cumulative Peak Flow from Existing to Proposed Condition – Balboa Double Track Extension site

	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
Watershed	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hydrology - Canyon Siding Extension

At the Canyon Siding Extension site, there is little change in ground elevation along the entire 8,400 ft ROW of new, proposed double tracking. From field observations, most changes will occur with cutting or filling existing slopes and depressions, respectively, in the proposed construction area. Existing circular culverts throughout the Proposed Project area will need to be modified or replaced with future maintenance being performed to avoid hydromodification, which is affirmed from Mott McDonald aerials. Some existing culverts were confirmed through field verification, while some outfalls could not be verified due to ROW constraints.

Exhibit 22 displays the downstream reach of receiving stream to be evaluated for hydromodification, which has not been disturbed by prior construction activities. **Table 17** shows the difference in cumulative peak flows at Castaic Creek for all watershed design storm events. The analysis point for cumulative peak flows is in Castain Creek. There are slight differences in impervious cover between the existing and proposed conditions.

However, since all other hydrologic parameters remain constant there is no increases in peak discharges, thereby indicating low hydromodification potential. **Figure 31** shows cumulative hydrographs for the watershed for the two-, five-, and 10-year design storm events.

Table 17: Change in Cumulative Peak Flow from Existing to Proposed Condition – Canyon Siding Extension

	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
Watershed	0.0	0.0	0.0	0.0	0.0	0.0	0.0

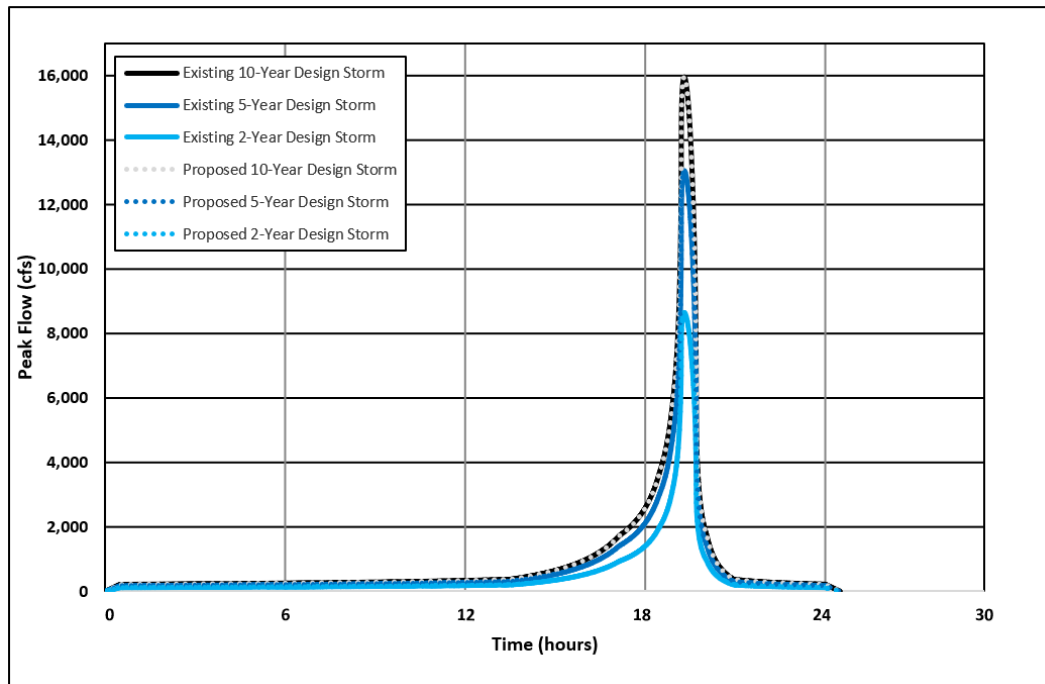


Figure 31: Canyon Siding Extension site comparison of cumulative hydrographs and peak flows for the two-year, five-year, and 10-year design storm events

Hydrology - Lancaster Terminal Improvements

At the Lancaster Terminal Improvements site, field observations reveal that the only change in grade is the decrease in elevation between the ROW and sidewalk adjacent to Sierra Hwy. The change in grade can be observed in the existing Metro parking lot as well as the existing City owned parking lot to the north. Plans show several parking lot inlets that receive flow due to this grade.

From Mott MacDonald Antelope Valley Line Environmental and Technical Studies CED, Lancaster Terminal Improvements will include a 22-foot-wide island platform that will impact the existing station parking lot. The proposed layover facility to the north is an extension from the existing main track. The existing City of Lancaster parking lot west will be impacted due to proposed additional storage tracks. A new storm drainage connection is proposed through Sierra Highway to the nearest manhole north of the layover facility. From Mott McDonald aerials, proposed stormwater improvements include storm drains in the northern project area near the intersection of Sierra Highway and West Avenue I, as seen in **Figure 28**.

Exhibit 23 displays the downstream reach of receiving stream to be evaluated for potential hydromodification, which has not been disturbed by prior construction activities. **Table 18** shows the difference in cumulative peak flows at Armargosa Creek tributary for all watershed design storm events. The analysis point for cumulative peak flows is in Armargosa Creek tributary as shown in **Exhibit 23**. There are slight differences in impervious cover between the existing and proposed conditions. However, since all other hydrologic parameters remain constant there is no increases in peak discharges, thereby indicating low hydromodification potential. **Figure 29** shows cumulative hydrographs for the watershed for the two-, five-, and 10-year design storm events.



Figure 28: Lancaster Terminal Improvements site proposed storm drain

Table 18: Change in Cumulative Peak Flow from Existing to Proposed Condition – Lancaster Terminal Improvements

	Two-yr, 24-hr Peak Flow (cfs)	Five-yr, 24-hr Peak Flow (cfs)	10-yr, 24-hr Peak Flow (cfs)	25-yr, 24-hr Peak Flow (cfs)	50-yr, 24-hr Peak Flow (cfs)	100-yr, 24-hr Peak Flow (cfs)	200-yr, 24-hr Peak Flow (cfs)
Watershed	0.0	0.0	0.0	0.0	0.0	0.0	0.0

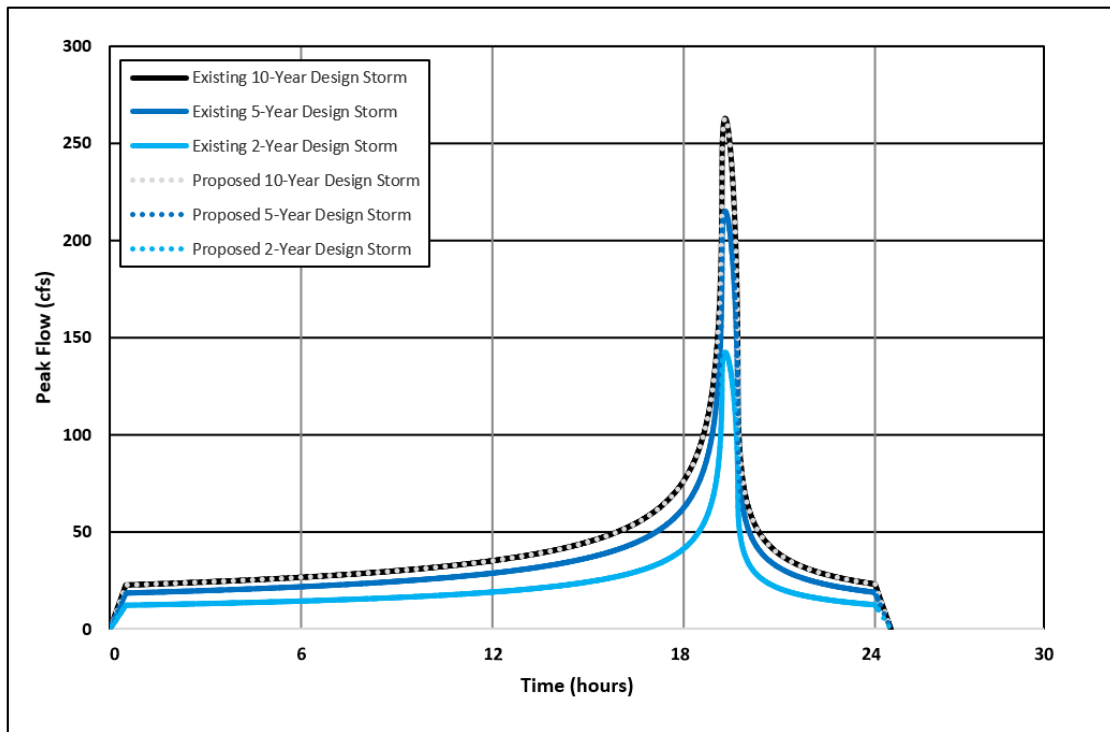


Figure 29: Lancaster Terminal Improvements site comparison in peak flow from existing to proposed condition for watershed drainage area in the two-year, five-year, and 10-year design storm events

Assessment of Erosion Impacts - Construction Activities and Existing Site Conditions

In addition to review of possible hydrologic impacts, potential erosion from proposed construction activities and existing site conditions needs to be considered. A review of the Geotechnical memorandum - Metrolink Antelope Valley Line - Santa Clarita Station has determined the following:

Field Assessment

Field observations reveal that a community of trees and vegetation have been established at all three capital improvement sites, thereby forming part of the existing ecology. These tree and vegetative species protect the current steep slopes and provide gradient stabilization. However, from Mott MacDonald, AVL Environmental and Technical Studies CED, construction activities will provide potential disturbance. Accordingly, additional field observations were conducted along the stream to note trees and vegetation that may be affected due to cut and fill operations.

Along the Balboa Double Track Extension site, it was determined that 14 Southern California Black Walnut (*Juglans californica*) are present in over 30% of the steep slope between the unimproved open channel and existing ROW. Southern California Black Walnut is used for bank stabilization, so removal during construction operations will pose a greater threat of erosion.

Another vegetative species observed was Coast Live Oaks (*Quercus agrifolia*) north of the I-5 underpass. Also known for its extensive root system to provide bank stabilization, this species is dotted throughout the project area. Removal of this species would affect slope integrity between I-5 and the ROW. An extent community of Coast Live Oaks are established with varying density along Canyon. From the CED, some sections require further cuts into previously excavated vertical slopes. Removal of this species will affect existing slope integrity and lead to potential erosion.

Finally, landscape trees were observed along the Lancaster Terminal Improvements site. The trees are aligned along Lancaster Station parking lot and City of Lancaster parking lot. There may be tree removal required during construction operations that could lead to potential erosion.

Balboa Double Track Extension

1. The area under I-5 at the Balboa Double Track Extension site has been identified as an area subject to potential hydromodification due to proposed construction activities. According to the CED, the existing track under I-5 will be realigned since it narrows through this underpass. From Sylmar Siding Plan and Profile maps, the planned

construction activities include retaining walls, pier protection, and grading along I-5 as displayed in **Figure 30**. Field observations and review of Mott McDonald aerials indicate the open channel that starts from Balboa Blvd. and crosses I-5 will be subject to erosion due to the slope between the ROW and open channel being subject to re-grading and placement of fill.

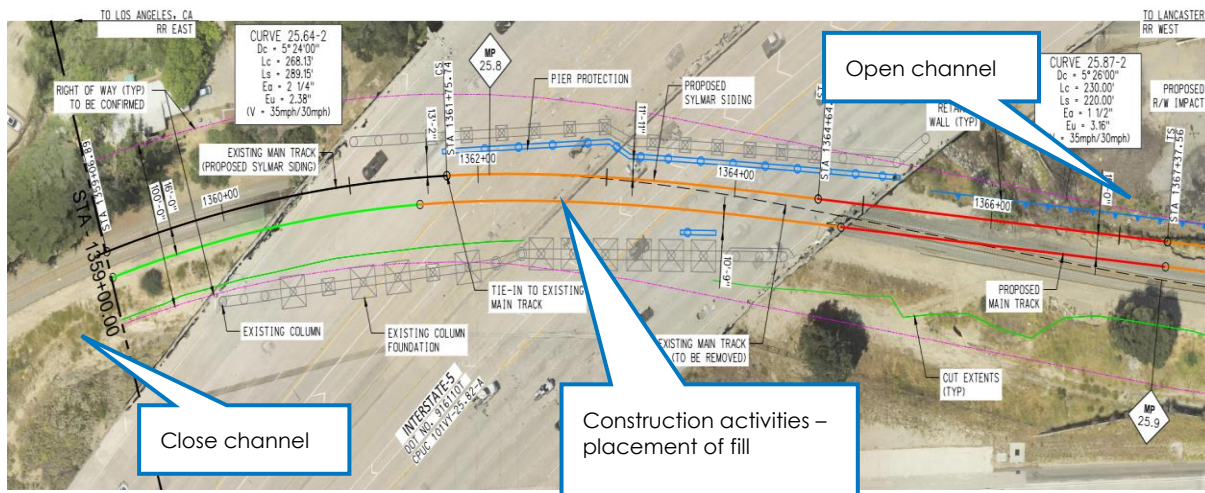


Figure 30: Balboa Double Track Extension potential hydromodification under I-5

- The California Geologic Survey Seismic Hazards Program have identified the hillsides adjacent to the ROW as zones/areas of potential landslides. The hillsides have the potential of producing landslides during periods of moderate to high precipitation. A dormant rockslide was mapped in 1997 and 1998 and is located between Station (Sta.) 1343 and Sta. 1357.
- The existing geological sedimentary deposits reveal a raveling and erosion potential on cut slopes greater than a 2H:1V. Grading in soil cut range from 5 ft to 25 ft.

Canyon Siding Extension

- The California Geologic Survey Seismic Hazards Program have been identified the hillsides adjacent to the ROW as zones/areas of potential landslides. The hillsides have the potential of producing landslides during periods of moderate to high precipitation.
- The existing geological structure of unknown origins may pose a block failure, raveling and/or erosion potential on cut slopes greater than 2H:1V. Grading in soil and rock cut range from 15 ft to 44 ft.

Erosion in Outfalls (Culvert) in the ROW

As it was detailed before in proposed condition, there is an increase in peak flow in some of the subcatchments in the Balboa Double Track Extension and Canyon Siding Extension project sites. Thus, it is expected an increase in velocity generating potential erosion. **Exhibits 24** through **26** show the potential erosion maps for the Balboa Double Track Extension, Canyon Siding Extension, and Lancaster Terminal Improvements sites, respectively.

Erosivity Assessment

From the EPA and NPDES, small construction sites are allowed to waive NPDES permitting requirements via a low erosivity waiver (LEW) for stormwater discharges if less than five acres are disrupted due to construction activity, and the rainfall erosivity factor R-value in the revised universal soil loss equation (RUSLE) is less than five during the period of construction.

The rainfall erosivity factor for all three sites was calculated based on recommendations from the EPA. The required information includes the project location and the duration of construction, which is estimated to be six months. The calculated R-value for Balboa Double Track Extension and Canyon Siding Extension sites is 14.1, and for the Lancaster Terminal Improvements site the value is 5.73. Accordingly, an NPDES stormwater permit is required for all three capital improvement sites.

Construction

No aspect of project construction would significantly alter the course of a stream or river as detailed in the discussion above, and impervious features associated with project construction would be adjacent to existing development on the AVL and its stations. As a result, streams would not be significantly impacted in terms of siltation or runoff, and flood flows would be unaffected. Although there is erosion potential in the Balboa Double Track Extension site area under I-5, the channel is not expected to be modified to an extent such that significant erosion is likely to occur beyond existing conditions. In addition, the project's construction would be in compliance with a project-specific SWPPP above as well as the Construction General Permit under NPDES.

Outfalls were identified at all three capital improvement sites. The Balboa Double Track Extension site has seven discharges into an existing drainage channel, there are two outfalls into Castaic Creek/Santa Clara River at the Canyon Siding Extension site, and sheet flow runs off of the Lancaster Terminal Improvements site to the north. Although discharges would occur following project implementation, project design as well as the implementation of a SWPPP would minimize impacts such that they are less than significant.

Operation

Because no project features are proposed in areas that could significantly affect streams, the addition of a new double track extension will only increase the peak flow 0.3 % resulting in no

Antelope Valley Line Capacity and Service Improvements Program

potential hydrologic hydromodification impacts, and because the project footprint would not significantly increase beyond existing conditions within existing ROW, project operations would have less than significant impacts in terms of erosion, runoff, and flood flows. Although there is elevated erosion potential due to channel improvements under I-5, the project does not propose alterations of the existing channel slope to an extent that erosion is likely to be significant. In addition, the minor increase in peak flows described above is unlikely to significantly impact downstream system capacity although specific hydraulics analysis is outside the scope of this investigation.

An Erosion Control Plan will be developed as required by the NPDES permit. **Exhibits 24, 25, and 26** display the erosion maps for the three capital improvement sites.

Impact D

Is the Proposed Project in a flood hazard, tsunami, or seiche zone? If so, would the Proposed Project risk release of pollutants due to project inundation?

Construction and Operations

None of the three capital improvements sites along the AVL are in flood zones as identified by FEMA. Peak flows are not appreciably increased in the 100-year or larger flood events and the Addition of a new double track extension will increase the peak flow only 0.3 % resulting in no potential hydrologic hydromodification impacts. Because no aspect of the Proposed Project's construction or operation can increase potential flood hazards, impacts would be less than significant.

Impact E

Would the Proposed Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Construction

Construction of the project would involve activities that have the potential to conflict with the water quality goals in the relevant plans detailed in the regulatory setting above through the spread of contaminants into surface or groundwater supplies. Outfalls were identified at all three project sites. The Balboa Double Track Extension site has seven discharges into an existing drainage channel, there are two outfalls into Castaic Creek/Santa Clara River at the Canyon Siding site, and sheet flow runs off of the Lancaster Terminal Improvements site to the north.

However, as previously detailed, the construction SWPPP, project design, and adherence to the mitigation measure would prevent the spread of contaminants into surface water through adherence to the U.S.

Occupational Safety and Health Administration regulations for the handling and storing of hazardous materials as well as the Construction General Permit and the MS4 Permit for the prevention of erosion. These regulations and practices, including those identified above as adopted by Los Angeles County, effectively control the potential for stormwater surface water pollution during construction.

Operations

No aspect of ongoing operations would be expected to obstruct implementation of a water quality control plan or sustainable groundwater management plan as the addition of a new double track extension will increase the peak flow only 0.3 %, resulting in no potential hydrologic hydromodification impacts (**Exhibits 27, 28, and 29**). The only changes relative to existing conditions are an increase of train frequency and volume in existing ROW as well as minor increases in peak flows resulting in less than significant levels of increased runoff such that any water quality control plan would be unaffected. Accordingly, impacts would be less than significant.

References

Mott MacDonald. 2020. Antelope Valley Line Environmental & Technical Studies Conceptual Engineering Design.

Mott MacDonald. 2020. Drone Aerial Photography.

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

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

http://dpw.lacounty.gov/wrd/Publication/engineering/2006_Hydrology_Manual.pdf

Los Angeles County Hydrological Map. <https://dpw.lacounty.gov/wrd/hydrologygis/>

Multi-Resolution Land Characteristics. <https://www.mrlc.org>

Exhibits

- Exhibit 1 – Balboa Double Track Extension Site Vicinity
- Exhibit 2 – Balboa Double Track Extension Aerial Photograph
- Exhibit 3 – Balboa Double Track Extension Topographic
- Exhibit 4 – Balboa Double Track Extension FEMA Floodplain
- Exhibit 5 – Balboa Double Track Extension Land Cover
- Exhibit 6 – Balboa Double Track Extension Existing Drainage Area
- Exhibit 7 – Balboa Double Track Extension Existing Soil Type
- Exhibit 8 – Canyon Siding Extension Site Vicinity
- Exhibit 9 – Canyon Siding Extension Aerial Photograph
- Exhibit 10 – Canyon Siding Extension Topographic
- Exhibit 11 – Canyon Siding Extension FEMA Floodplain
- Exhibit 12 – Canyon Siding Extension Land Cover
- Exhibit 13 – Canyon Siding Extension Existing Drainage Area
- Exhibit 14 – Canyon Siding Extension Existing Soil Type
- Exhibit 15 – Lancaster Terminal Improvements Site Vicinity
- Exhibit 16 – Lancaster Terminal Improvements Aerial Photograph
- Exhibit 17 – Lancaster Terminal Improvements Topographic
- Exhibit 18 – Lancaster Terminal Improvements FEMA Floodplain
- Exhibit 19 – Lancaster Terminal Improvements Land Cover
- Exhibit 20 – Lancaster Terminal Improvements Existing Drainage Area
- Exhibit 21 – Balboa Double Track Extension Watershed Map
- Exhibit 22 – Canyon Siding Extension Watershed Map
- Exhibit 23 – Lancaster Terminal Improvements Watershed Map
- Exhibit 24 – Balboa Double Track Extension Erosion Map
- Exhibit 25 – Canyon Siding Extension Erosion Map
- Exhibit 26 – Lancaster Terminal Improvements Erosion Map
- Exhibit 27 – Balboa Double Track Extension Hydromodification Map
- Exhibit 28 – Canyon Siding Extension Hydromodification Map
- Exhibit 29 – Lancaster Terminal Improvements Hydromodification Map

Appendices

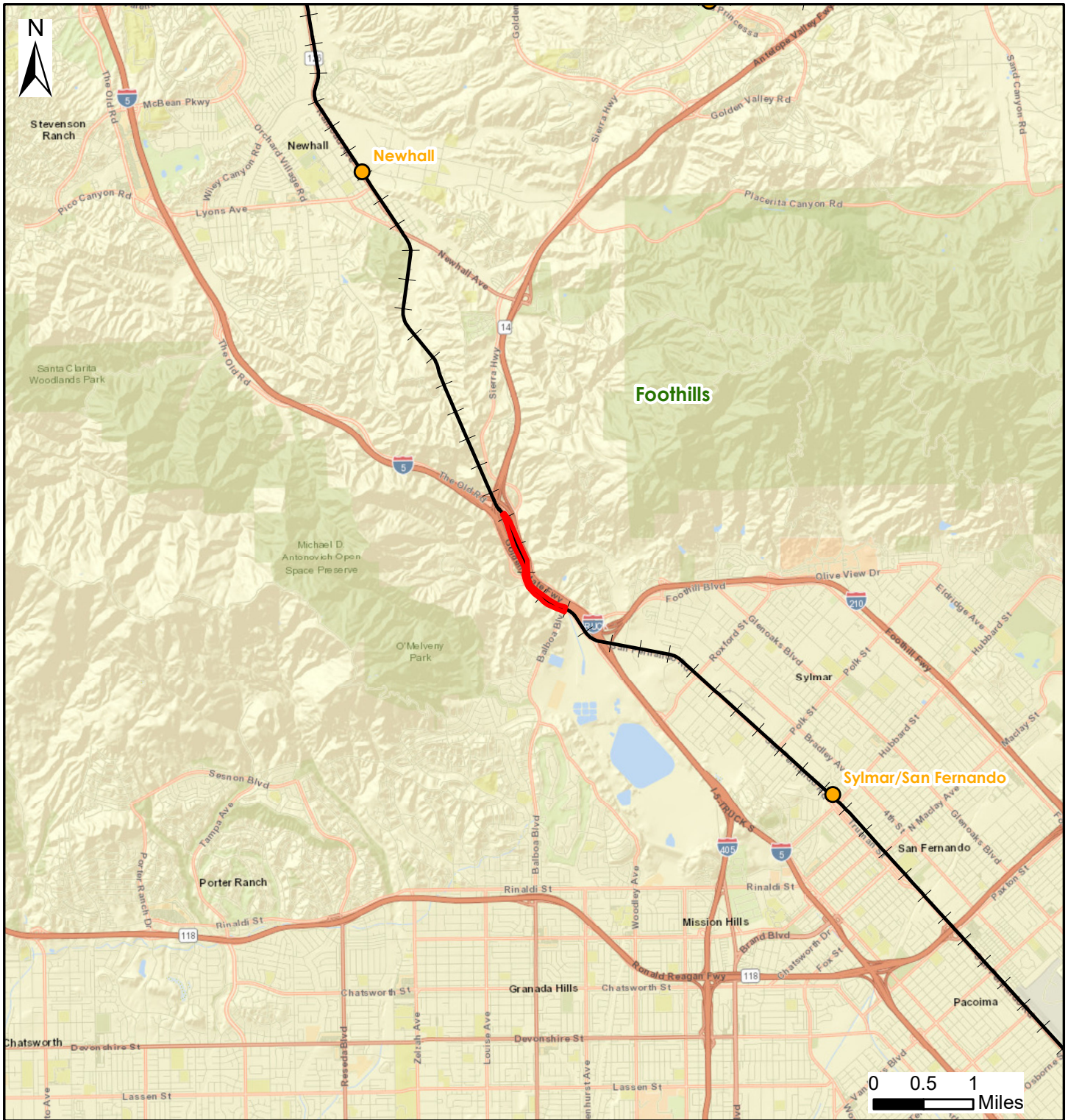
- Appendix A – Rainfall Data
- Appendix B – MODRAT Input and Output Data



Water Resources and Hydrology Technical Memo

Antelope Valley Line

Exhibits



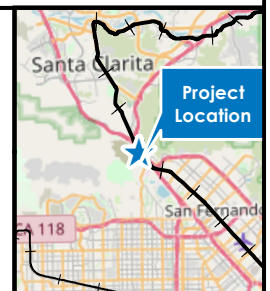
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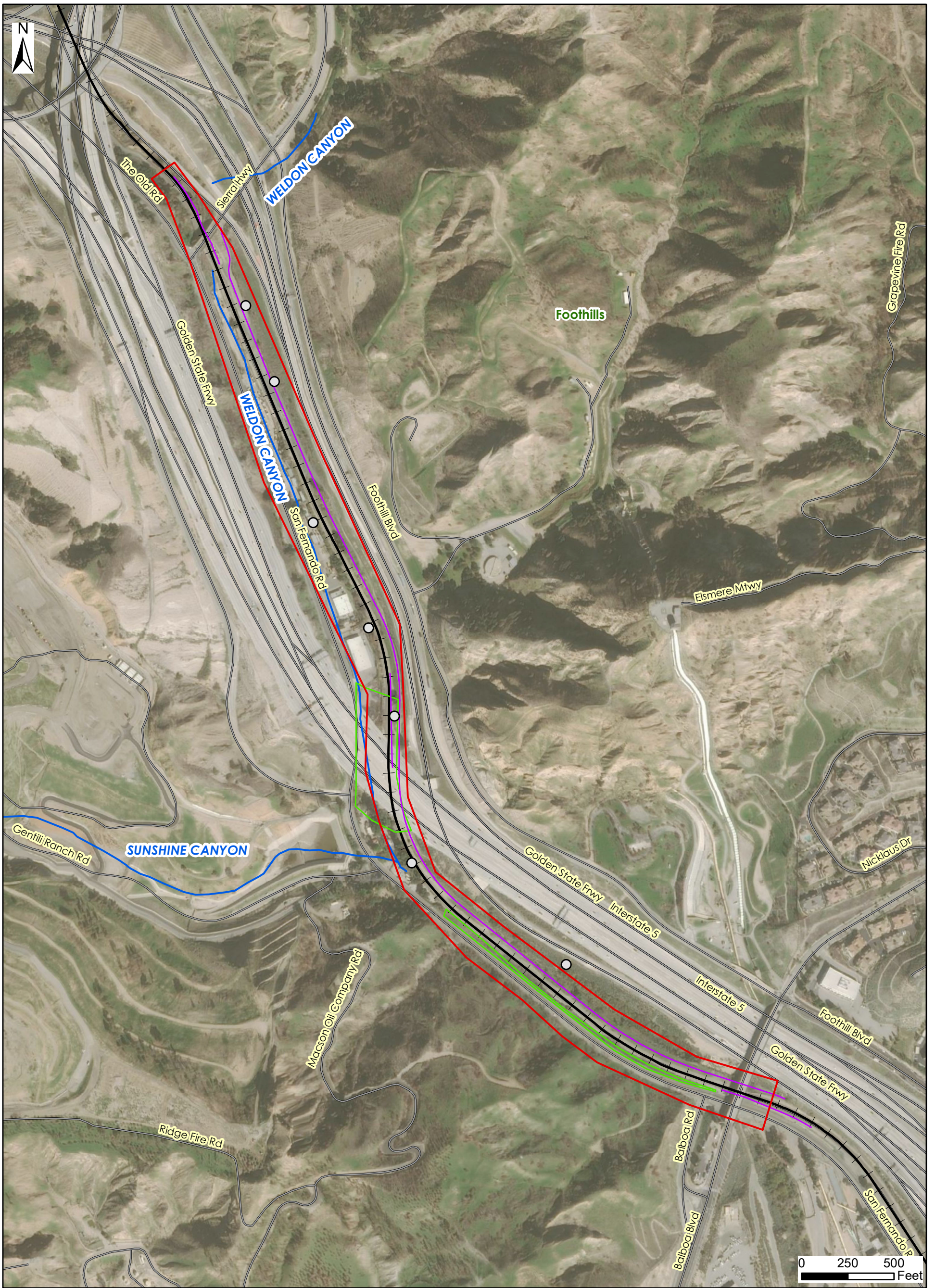
Exhibit 1 - Balboa Double Track Extension Site Surroundings Map



Legend

- Metrolink Stations
- Antelope Valley Line
- Project Area

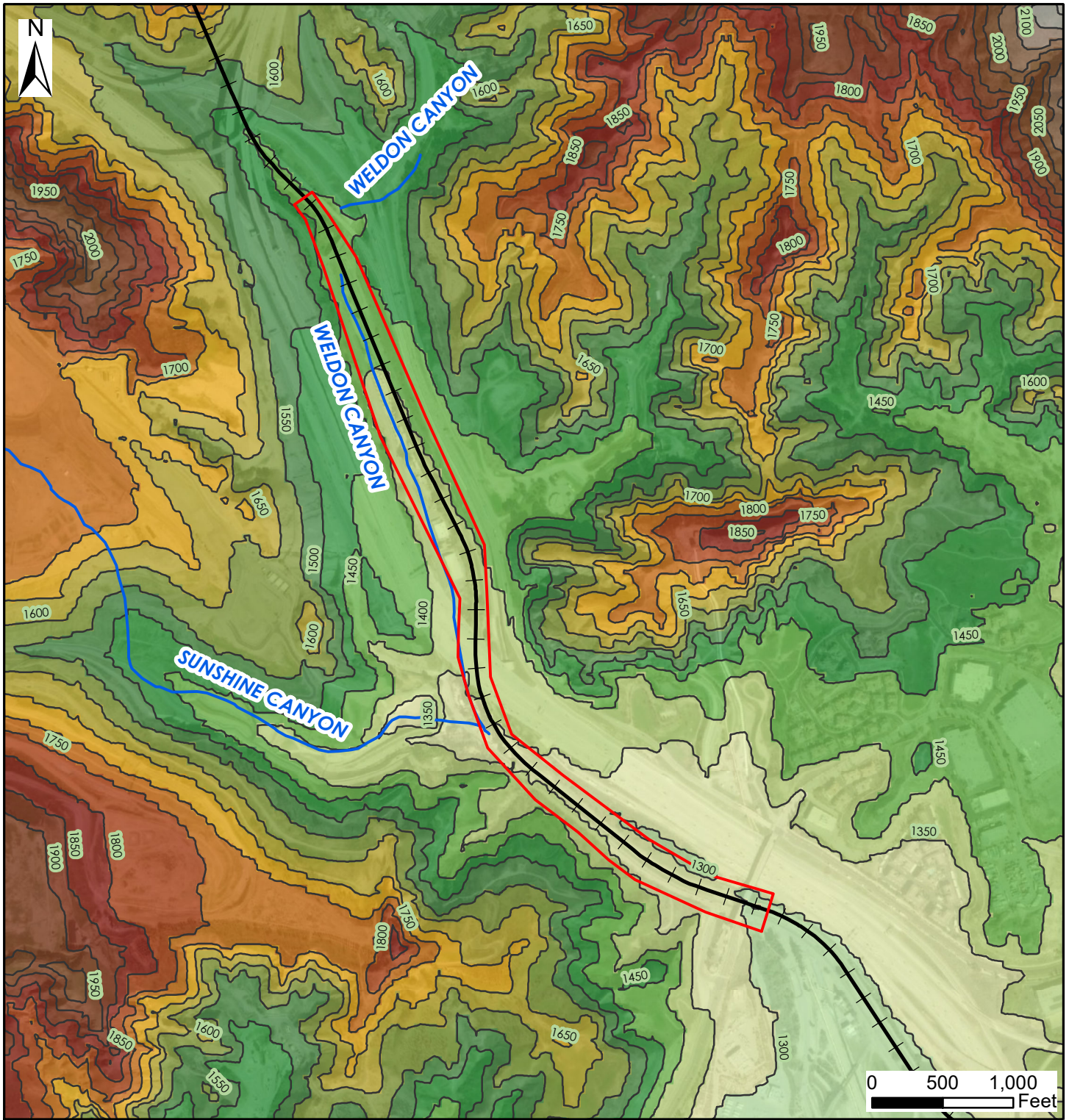




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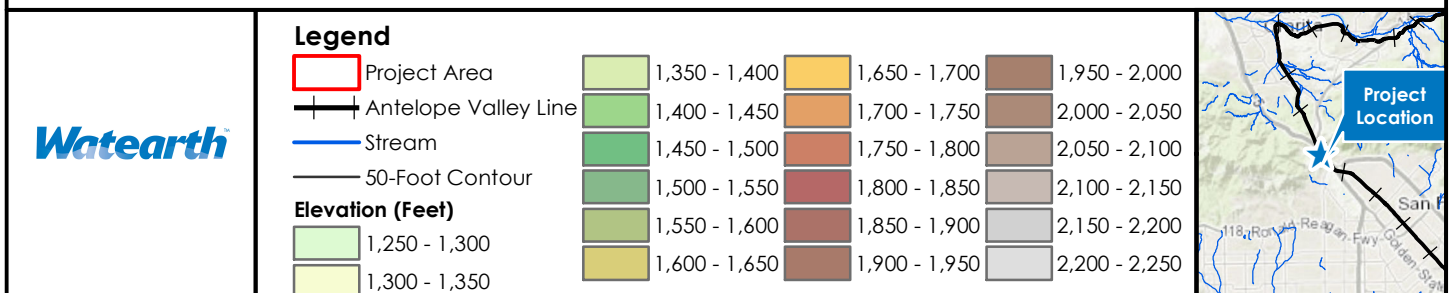
Exhibit 2 - Balboa Double Track Extension Aerial Photograph

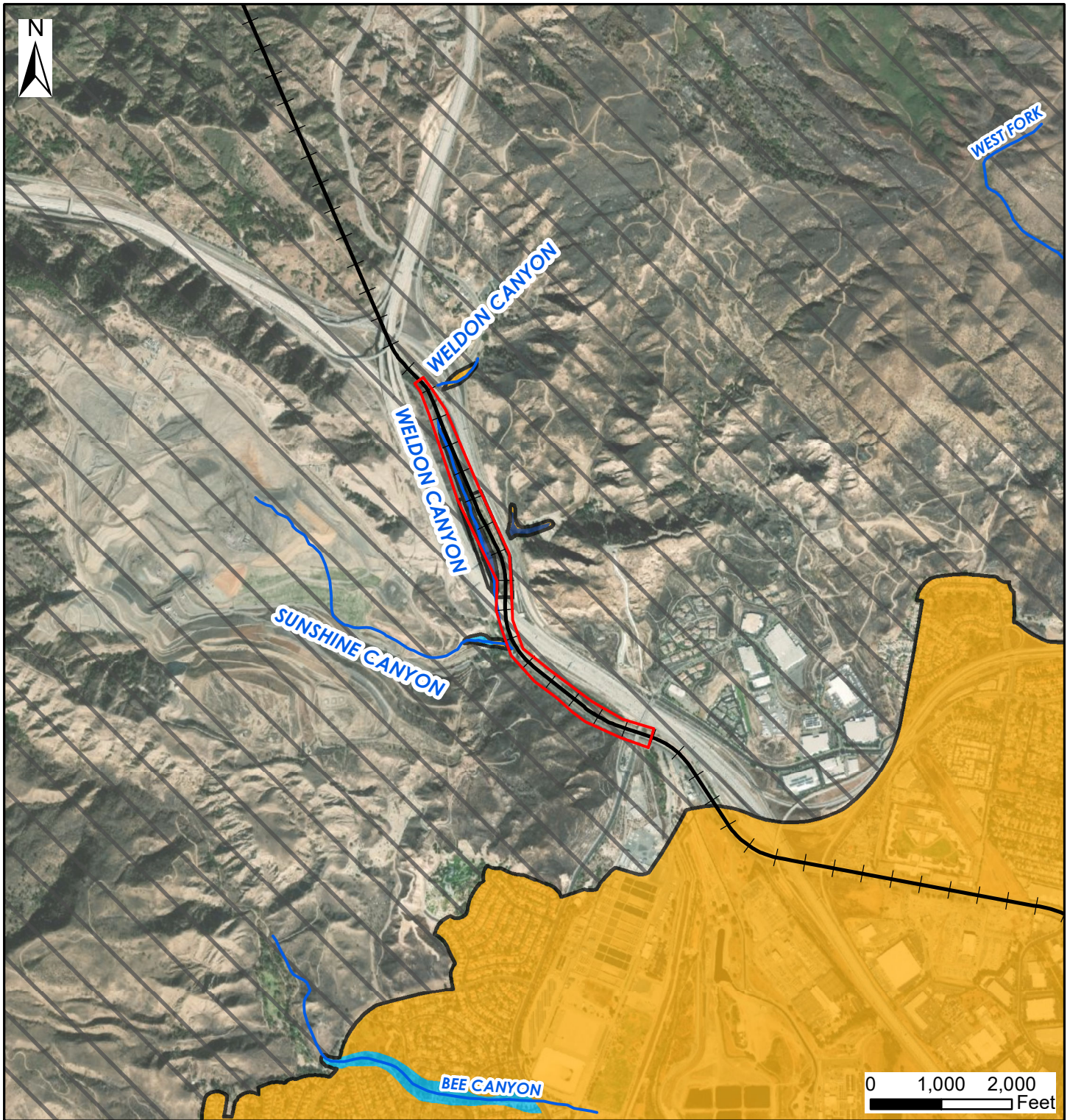
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	<ul style="list-style-type: none"> ○ Existing Outfall —+— Antelope Valley Line — Stream — Road — Proposed Access Road 	<ul style="list-style-type: none"> Project Area Site Reconnaissance Area



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Exhibit 3 - Balboa Double Track Extension Topographic Map

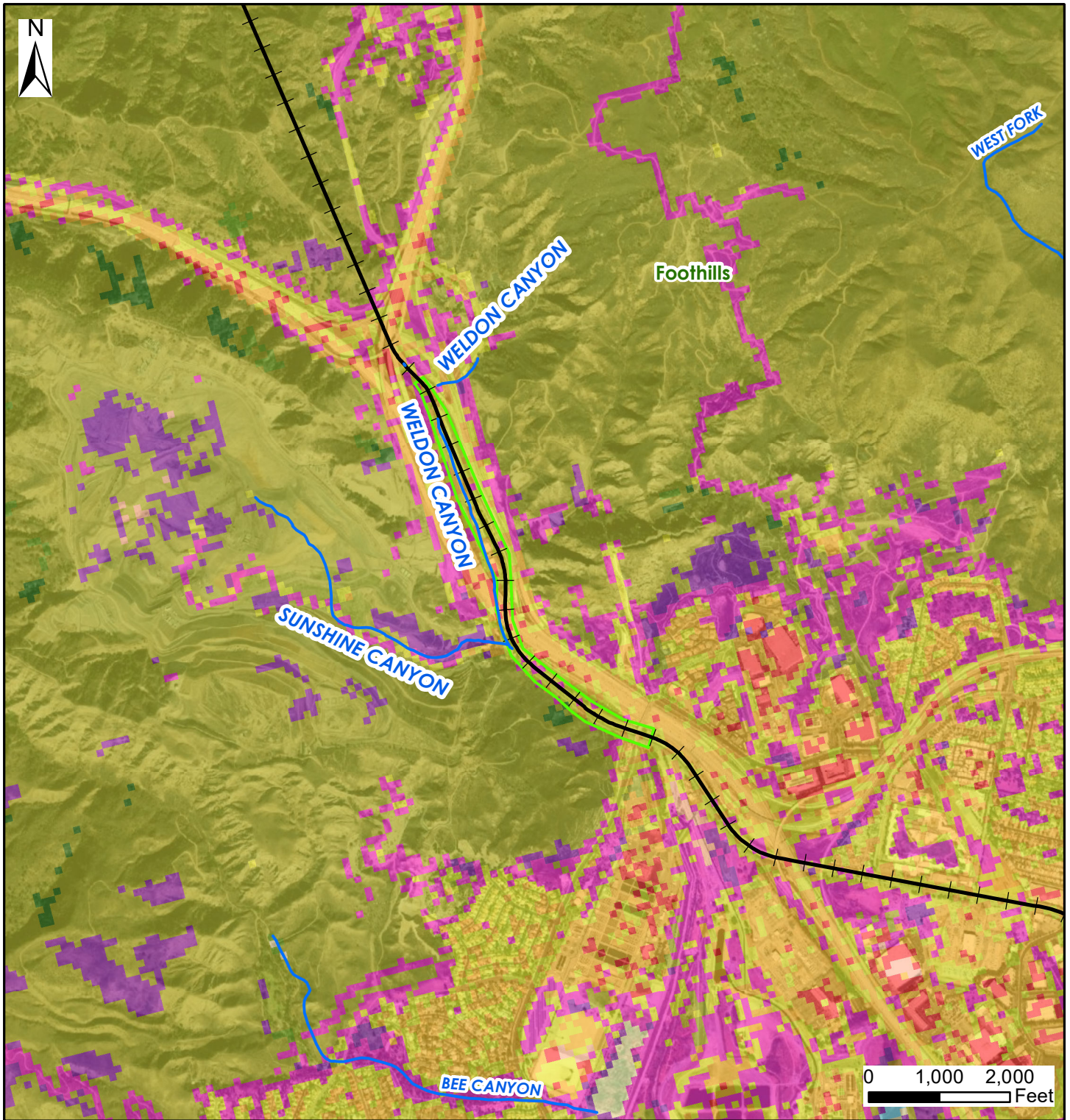




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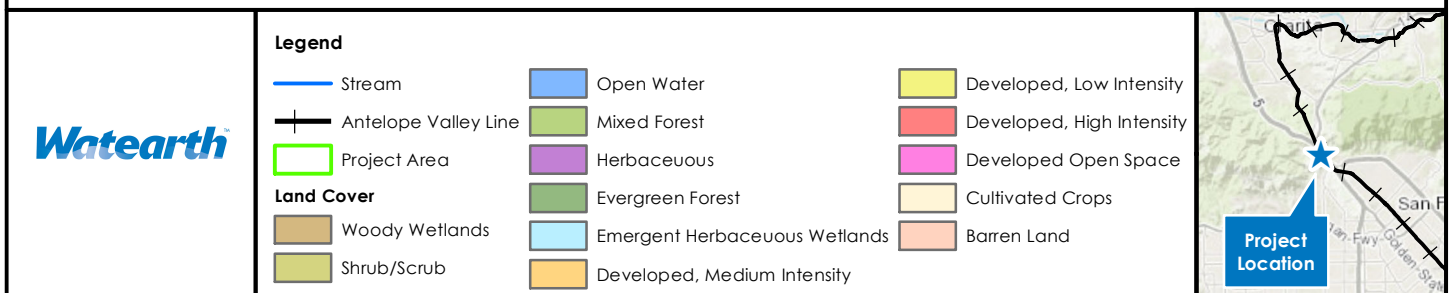
Exhibit 4- Balboa Double Track Extension FEMA Floodplain Map

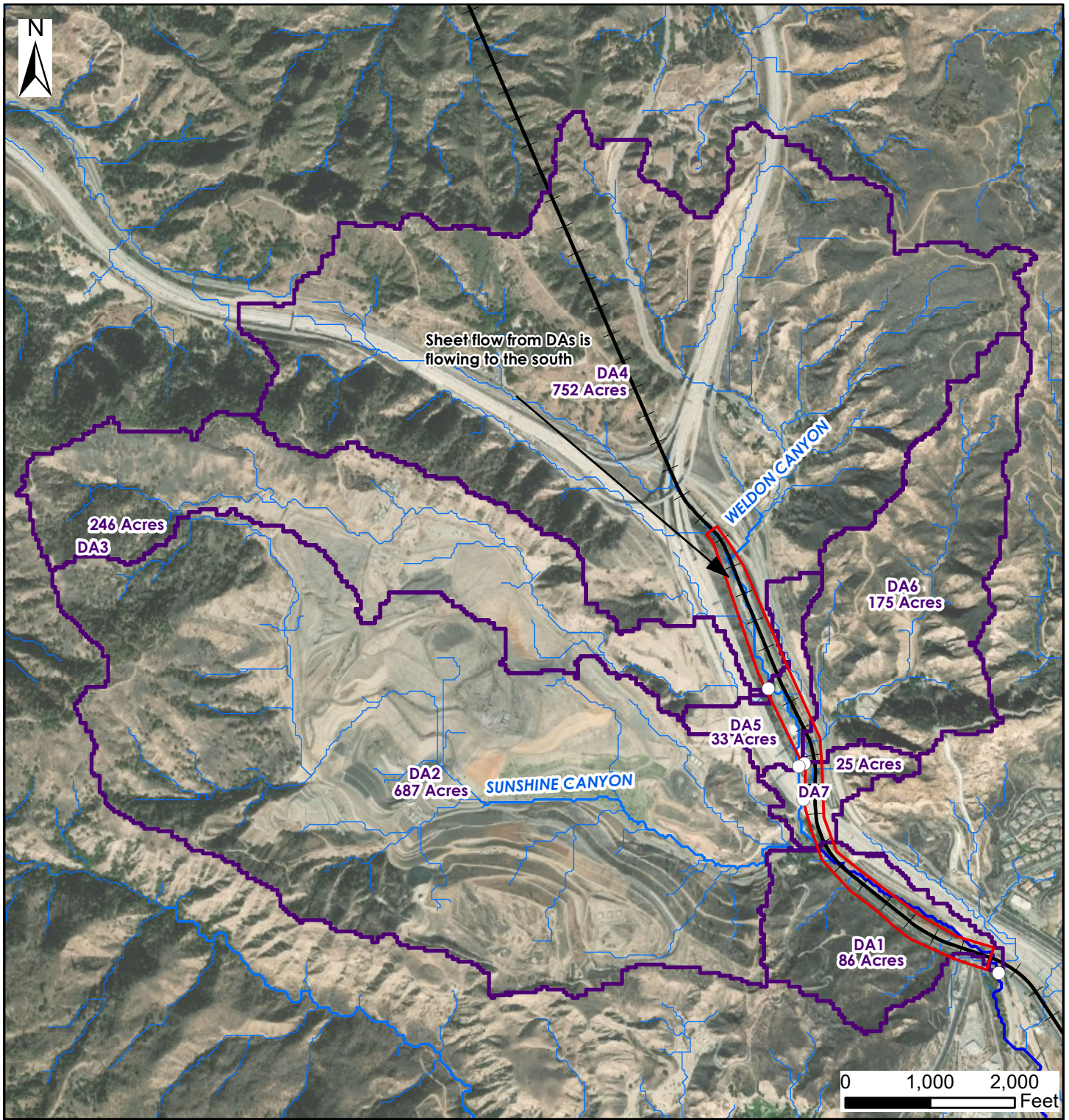
	Legend		
	Antelope Valley Line Waters of the State Project Area	FEMA Floodplain A AE	D X



Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 5 - Balboa Double Track Extension Land Cover Map

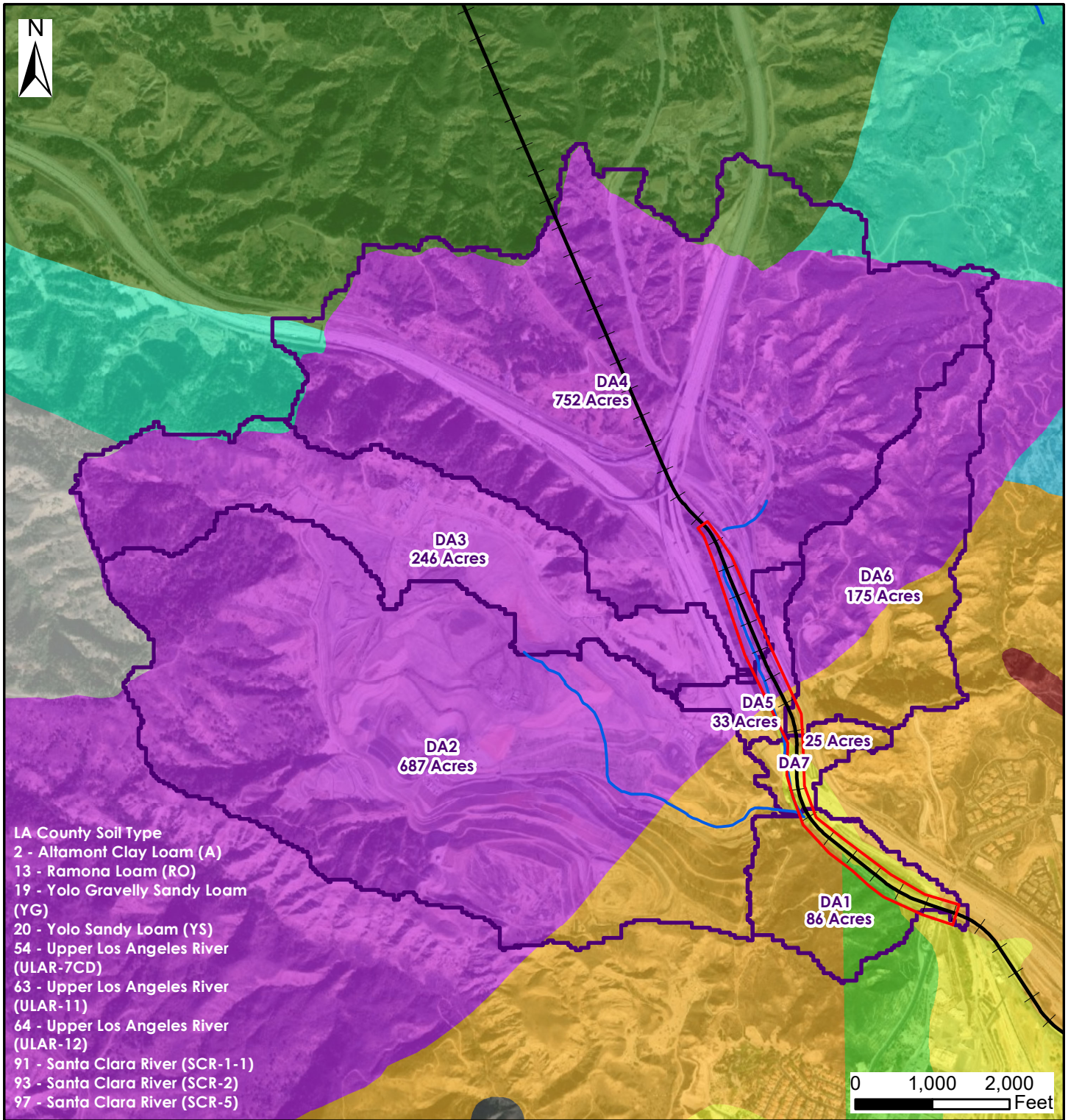




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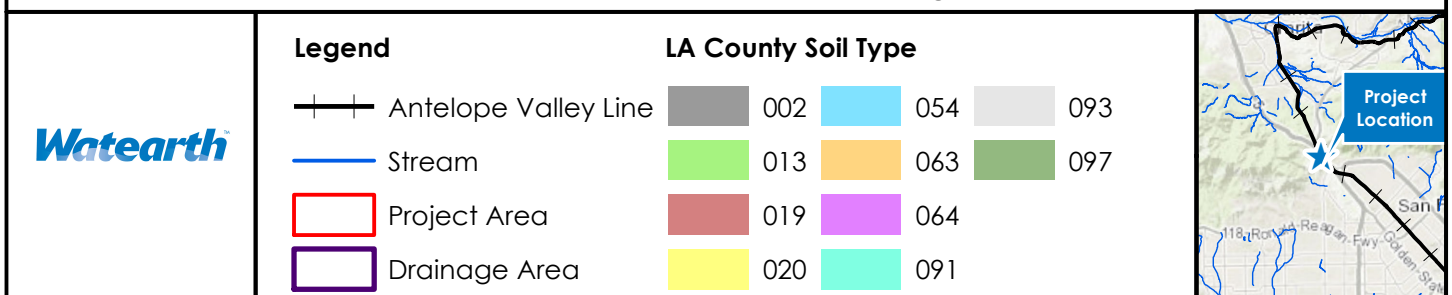
Exhibit 6 - Balboa Double Track Extension Drainage Area Map

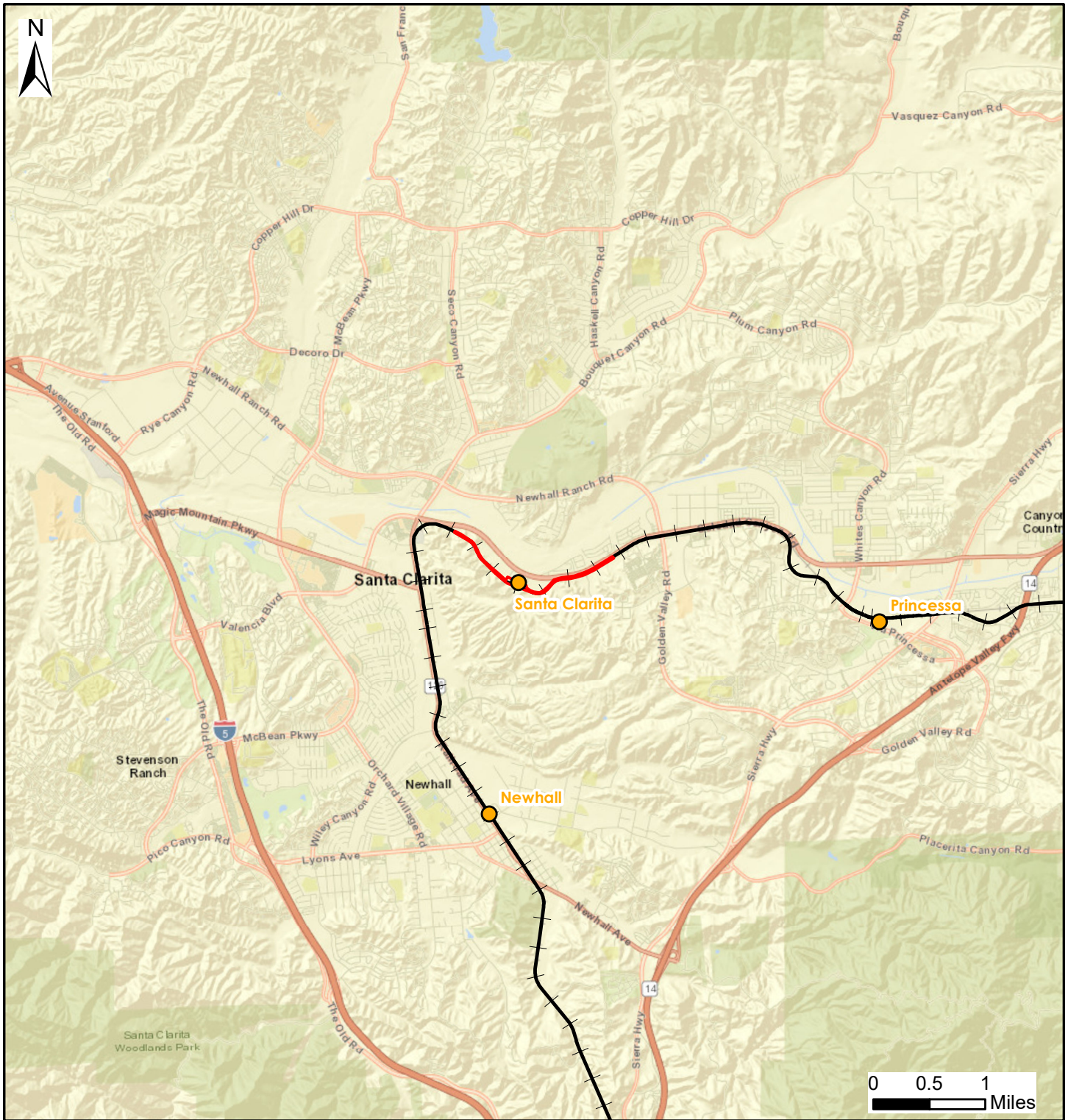
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	Discharge Location Antelope Valley Line Stream 			



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Exhibit 7 - Balboa Double Track Extension Existing Soil Type Map

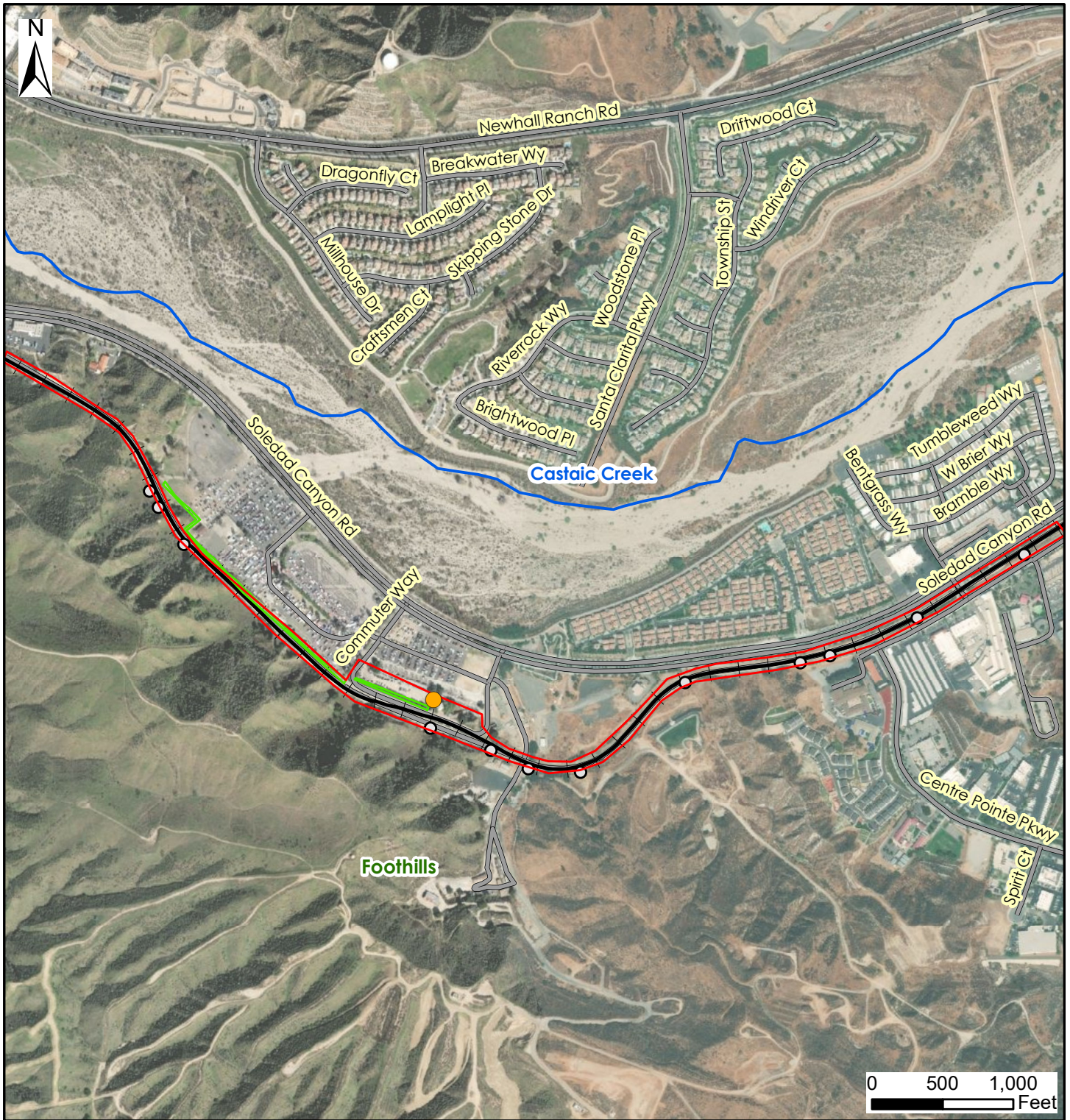




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Exhibit 8 - Canyon Siding Extension Site Vicinity Map

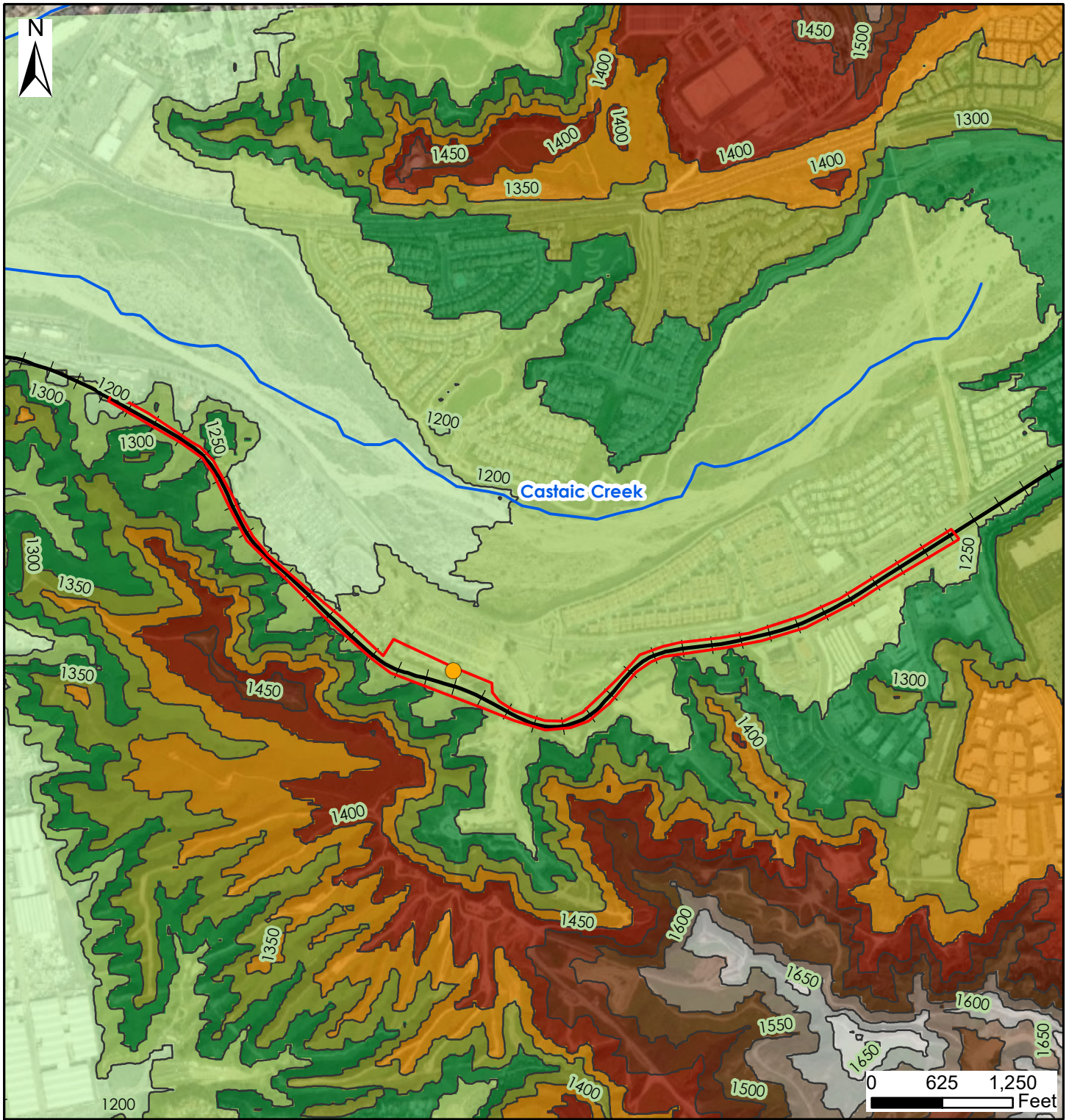
	<p>Legend</p> <ul style="list-style-type: none"> Metrolink Station Antelope Valley Line Project Area 	
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Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

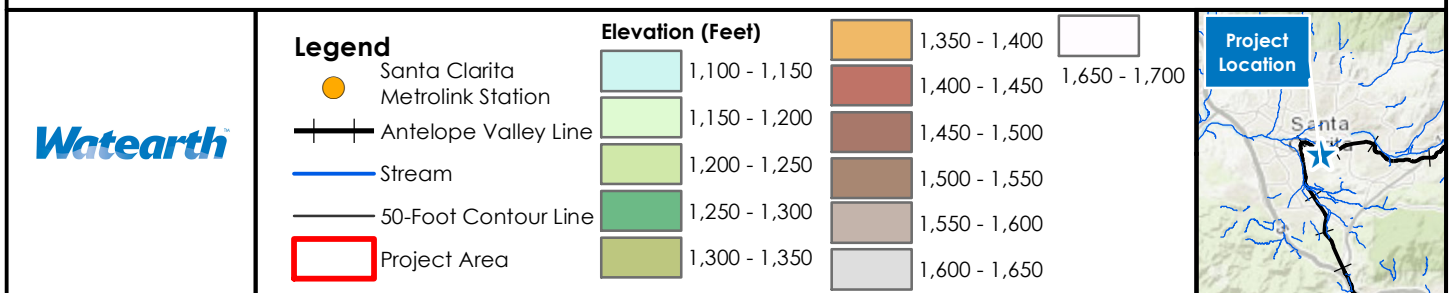
Exhibit 9 - Canyon Siding Extension Aerial Photograph

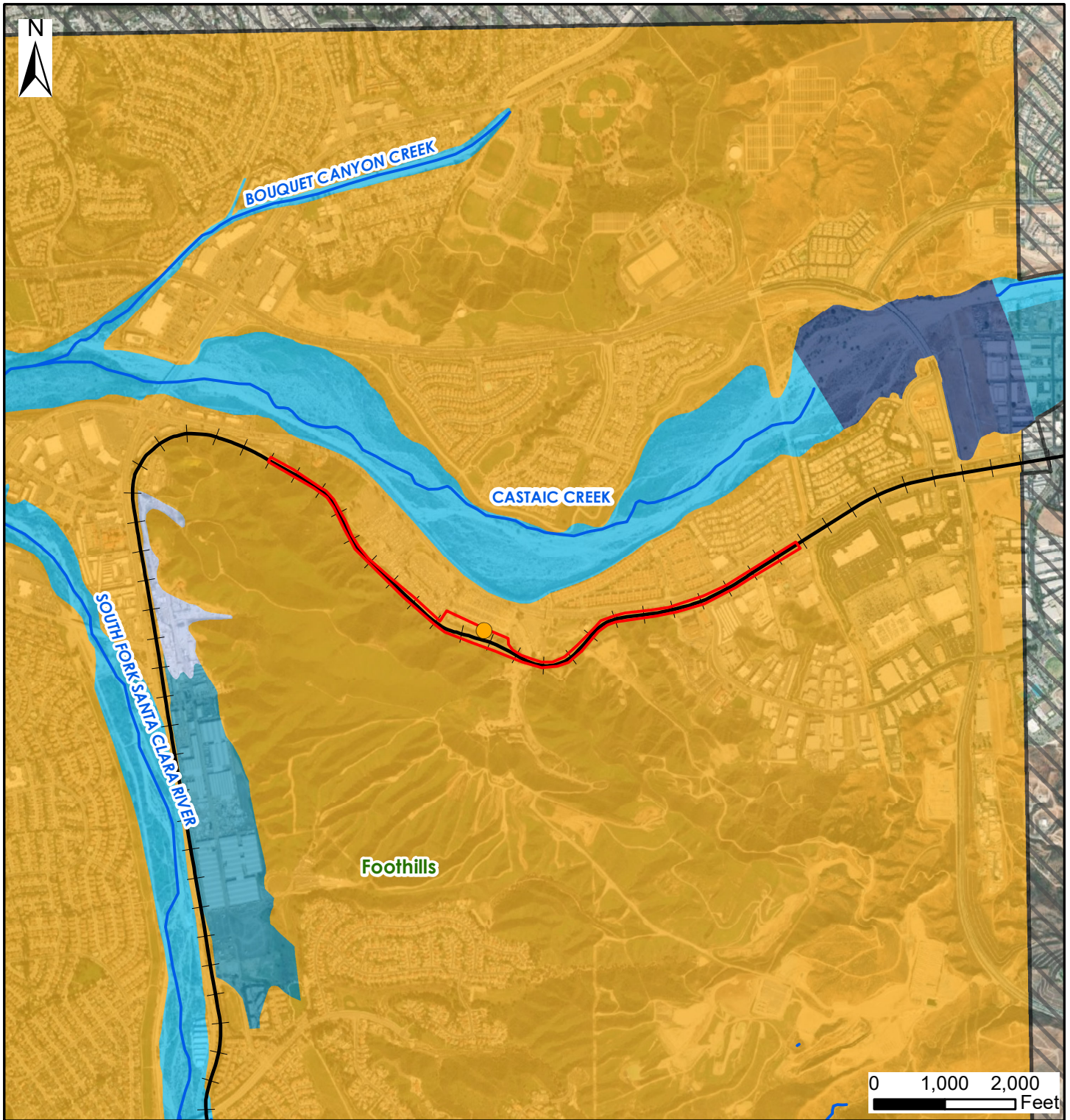
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Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 10 - Canyon Siding Extension Topographic Map

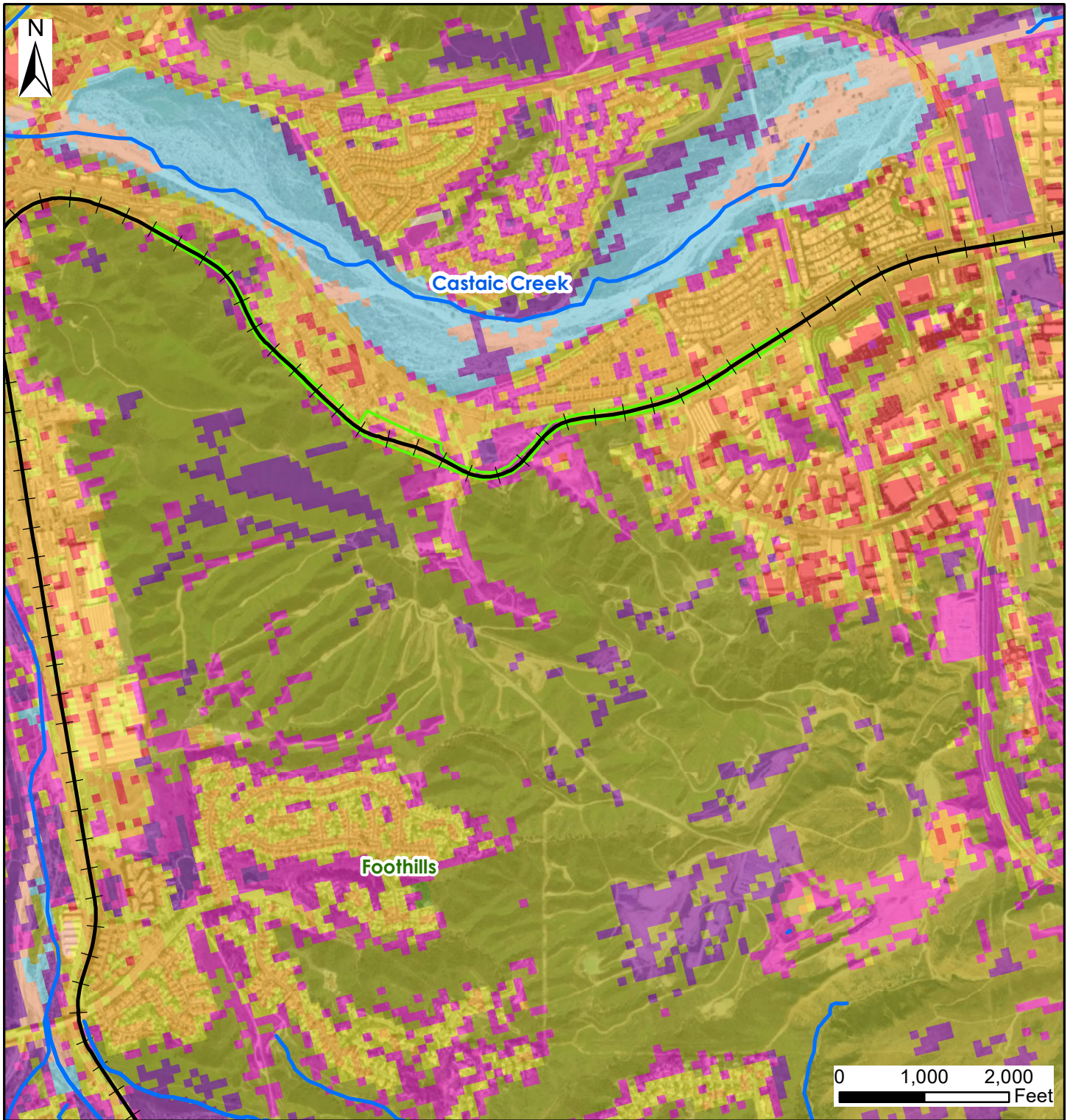




Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 11 - Canyon Siding Extension FEMA Floodplain Map

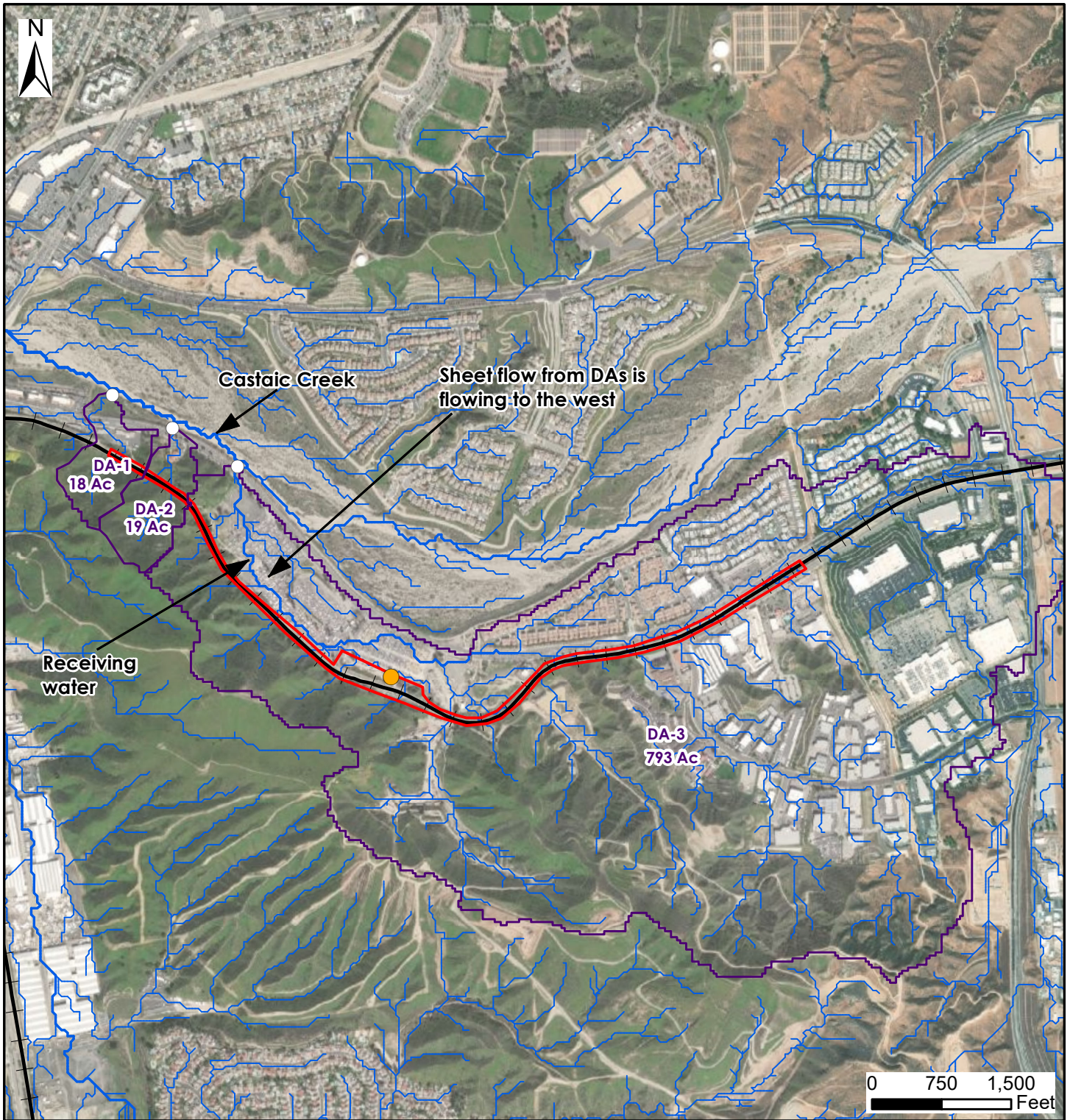
	<p>Legend</p> <ul style="list-style-type: none"> ● Santa Clarita Metrolink Station Antelope Valley Line Stream Project Area 		<p>FEMA Floodplain</p> <ul style="list-style-type: none"> A AE AH AO D X 		<p>Project Location</p>
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Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

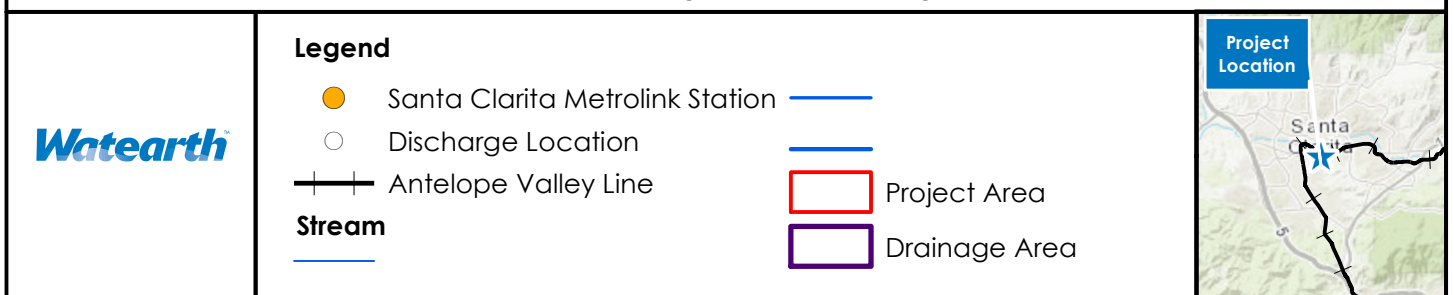
Exhibit 12 - Canyon Siding Extension Land Cover Map

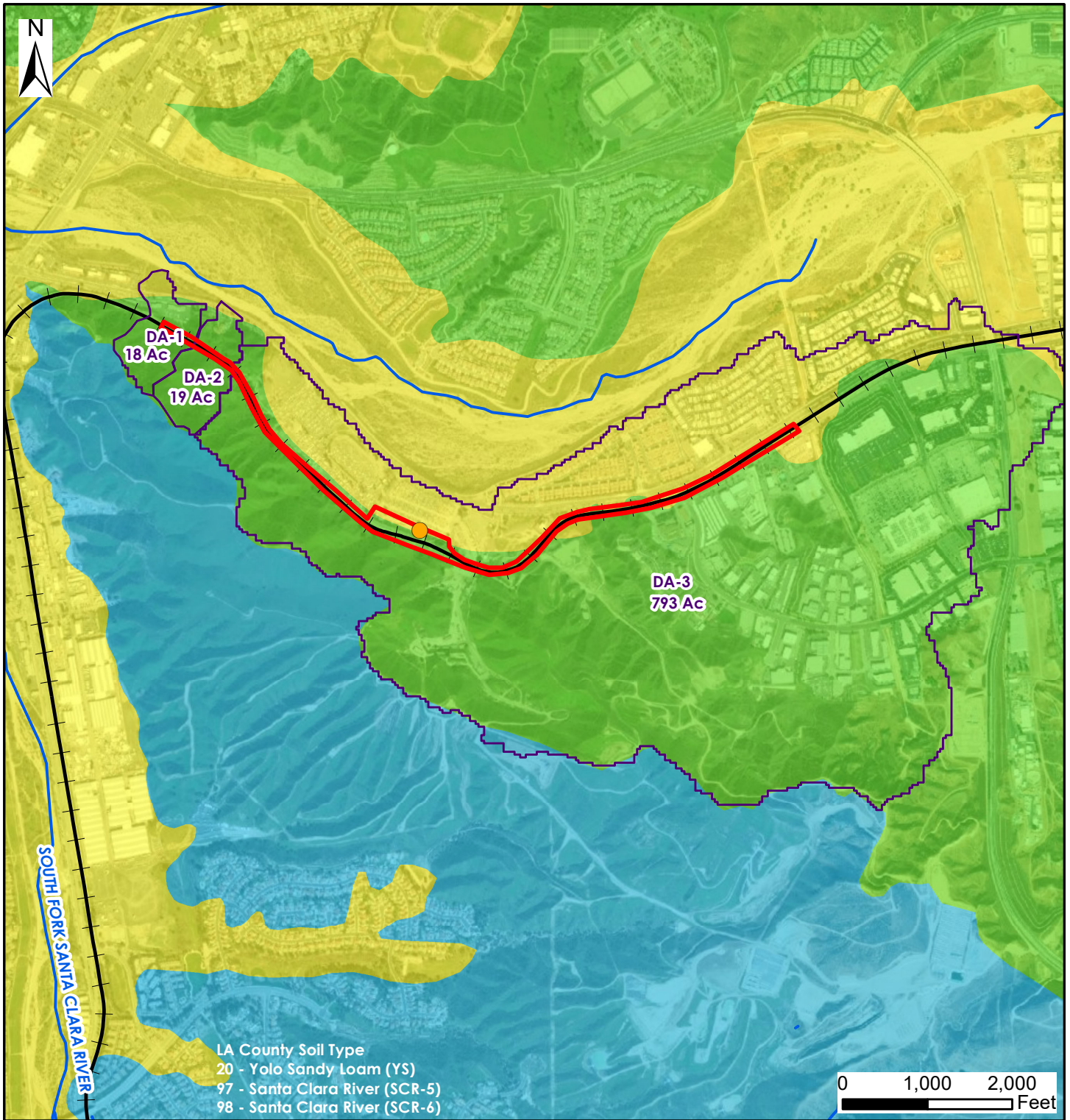
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Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

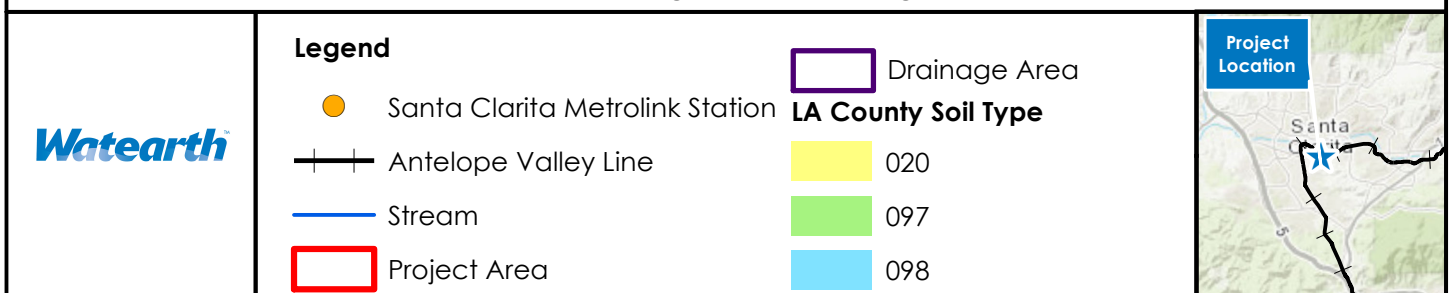
Exhibit 13 - Canyon Siding Extension Drainage Area Map

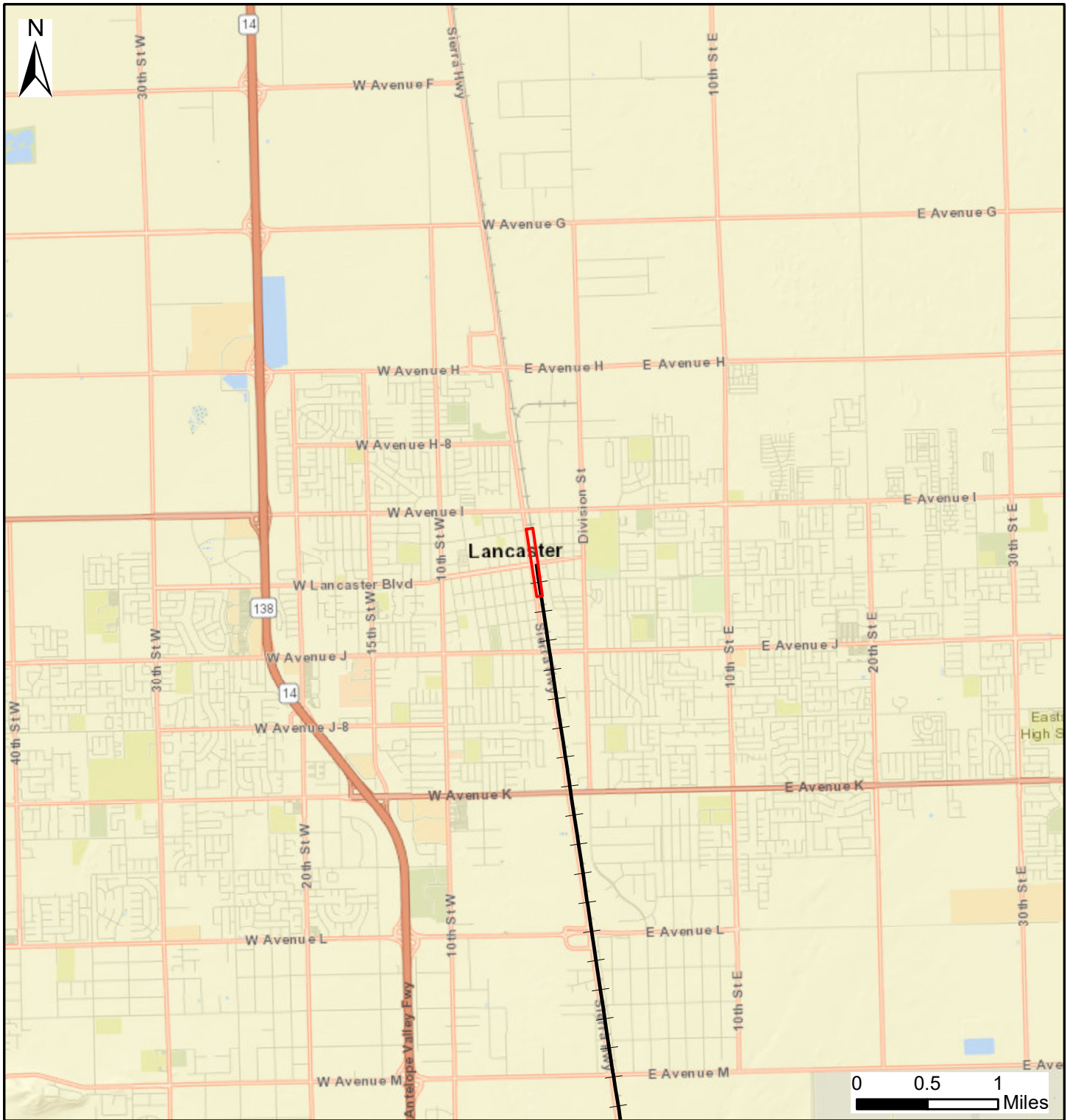




Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 14 - Canyon Siding Extension Existing Soil Type Map





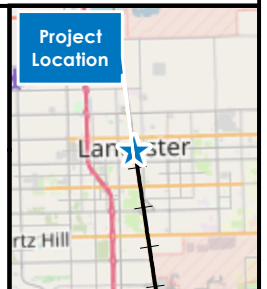
Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

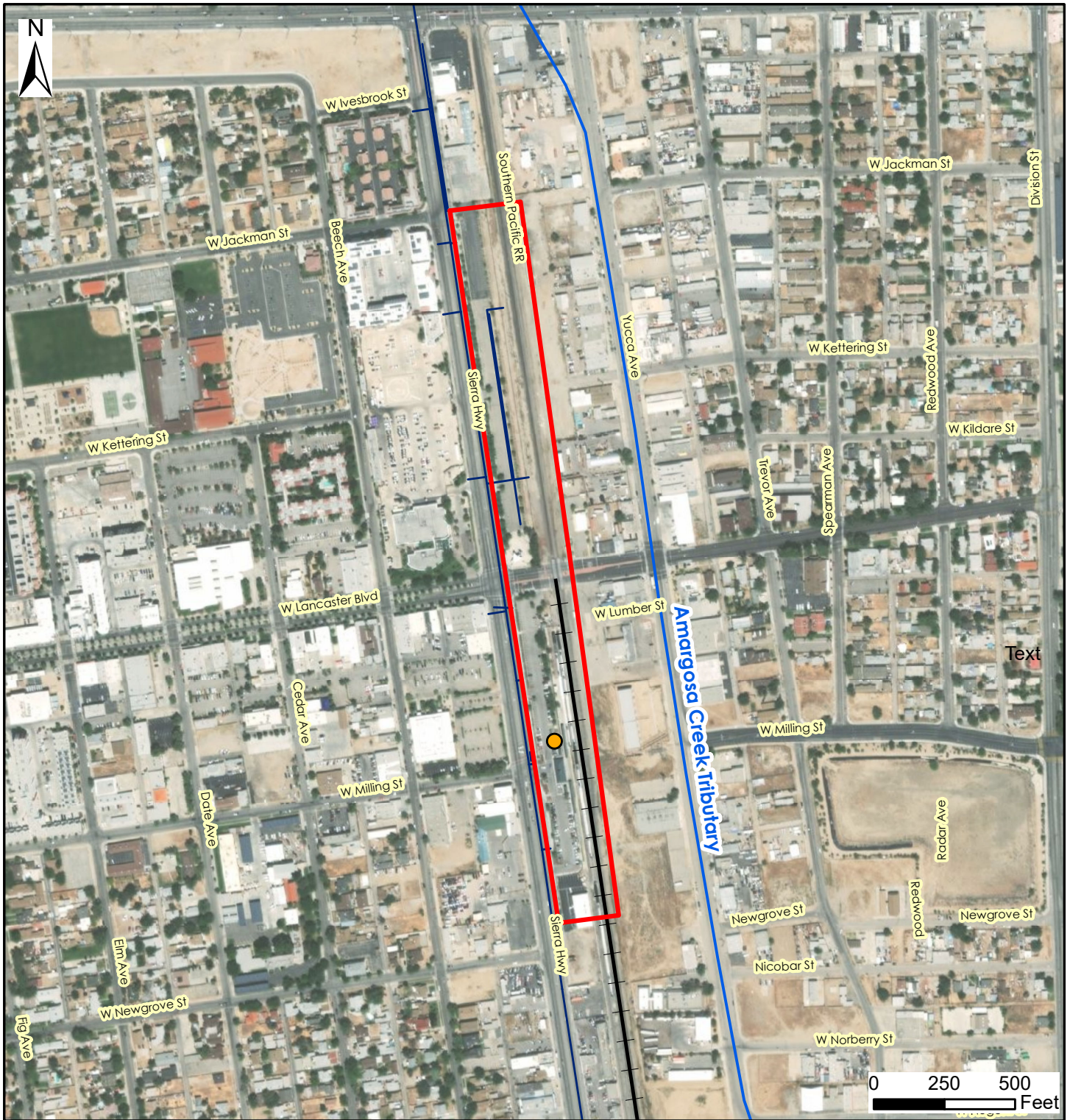
Exhibit 15 - Lancaster Terminal Improvements Site Surroundings Map



Legend

-  Antelope Valley Line
-  Project Area










Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

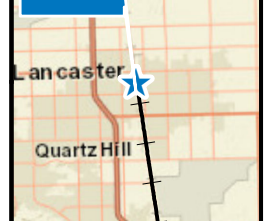
Exhibit 16 - Lancaster Terminal Improvements Aerial Photograph

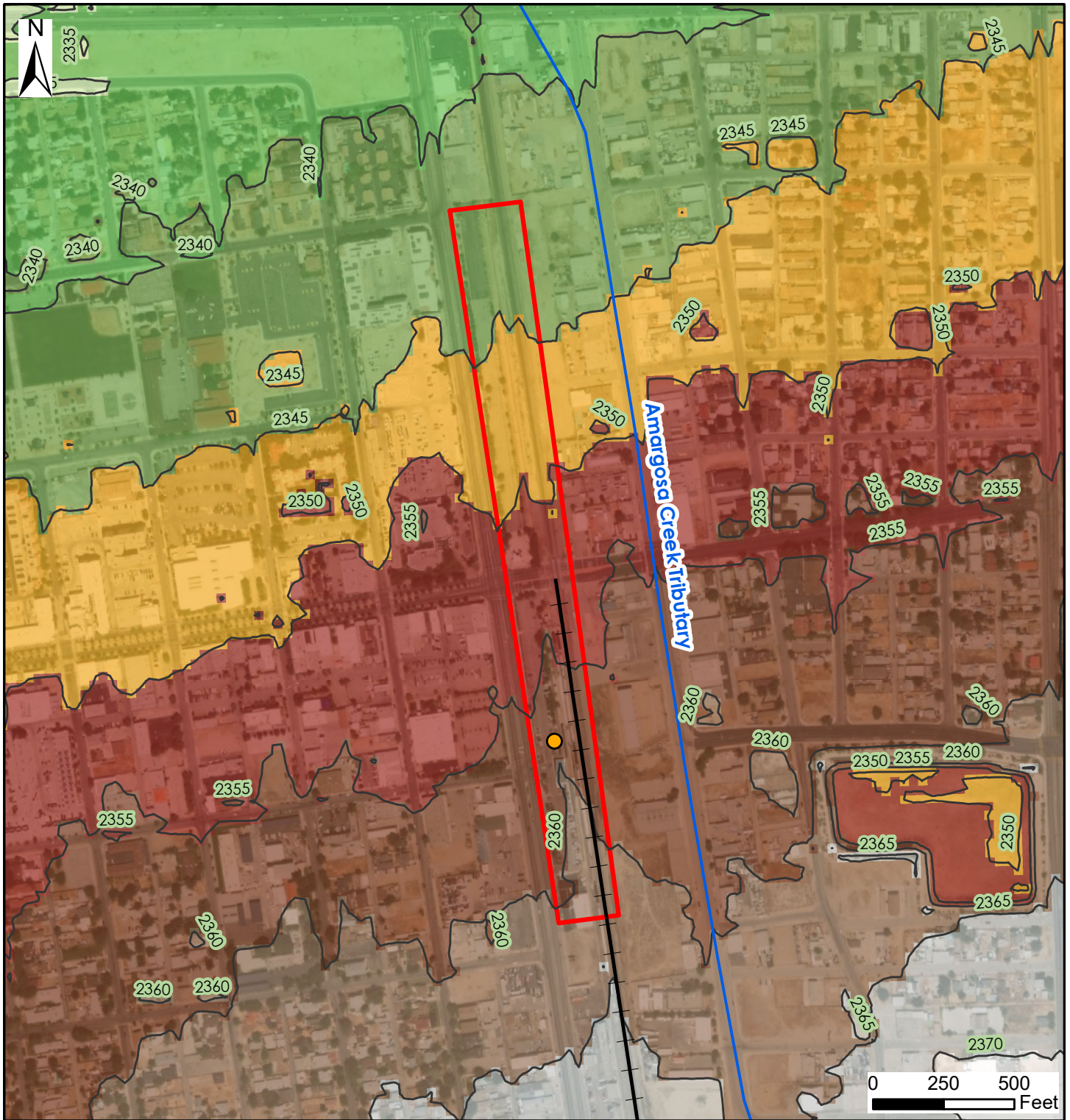


Legend

-  Lancaster Metrolink Station
-  Project Area
-  Antelope Valley Line
-  Stream
-  Access Roads

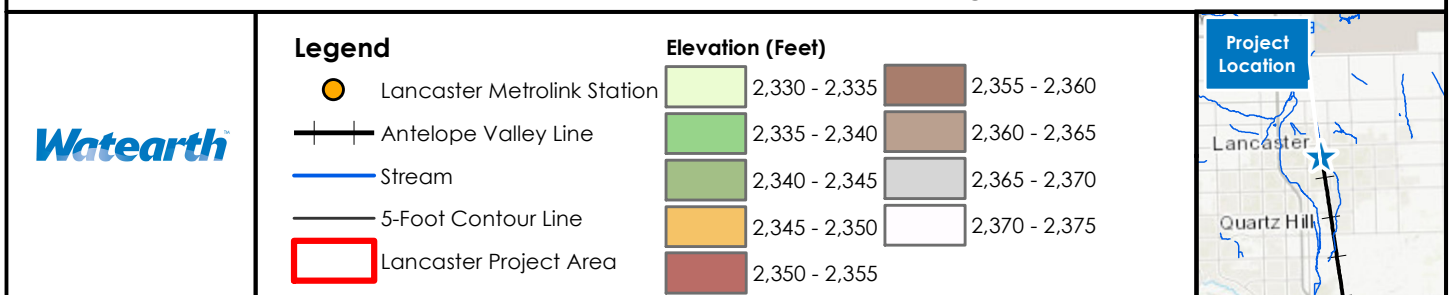
Project Location

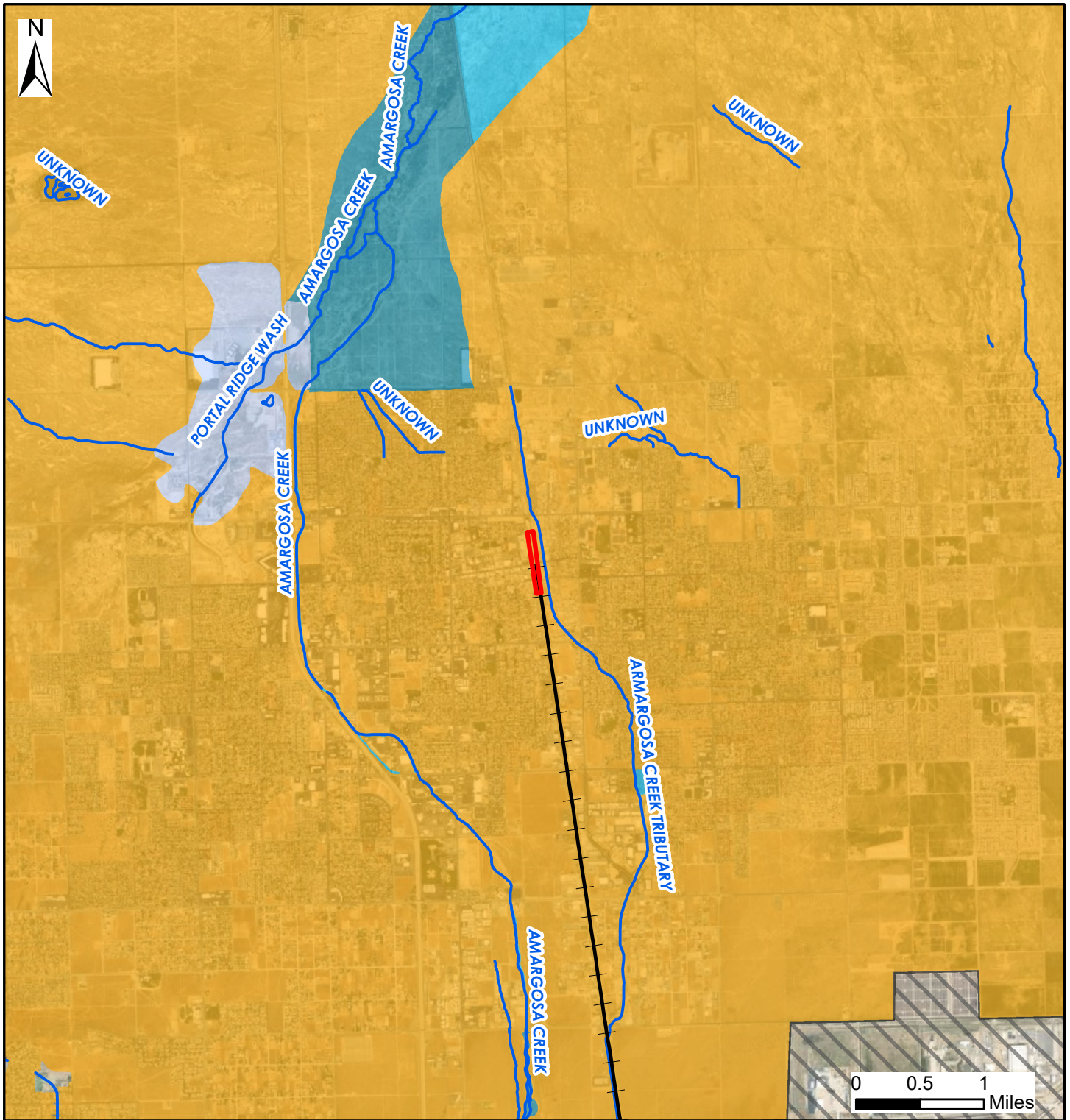




Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 17 - Lancaster Terminal Improvements Topographic Map

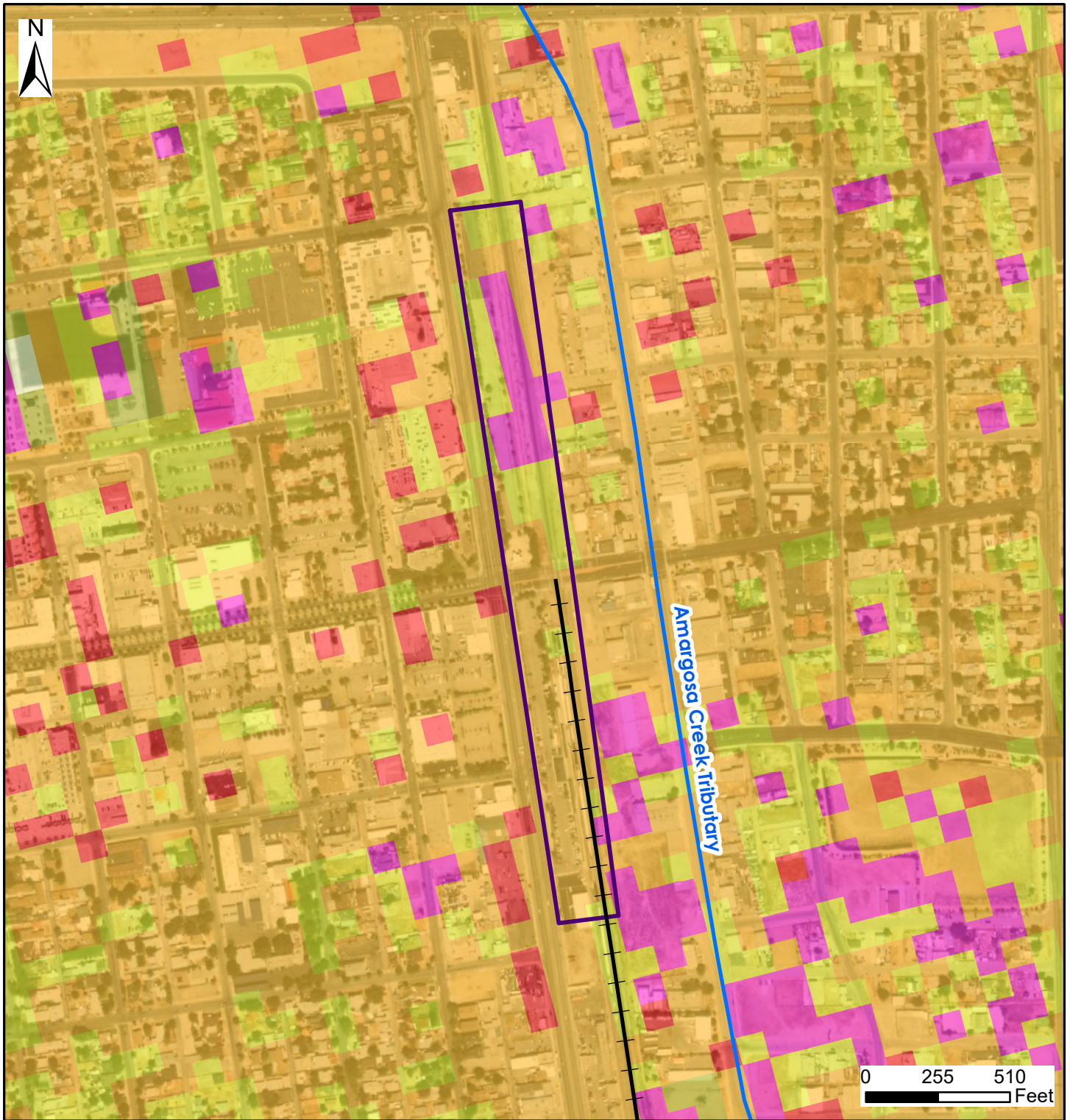




Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

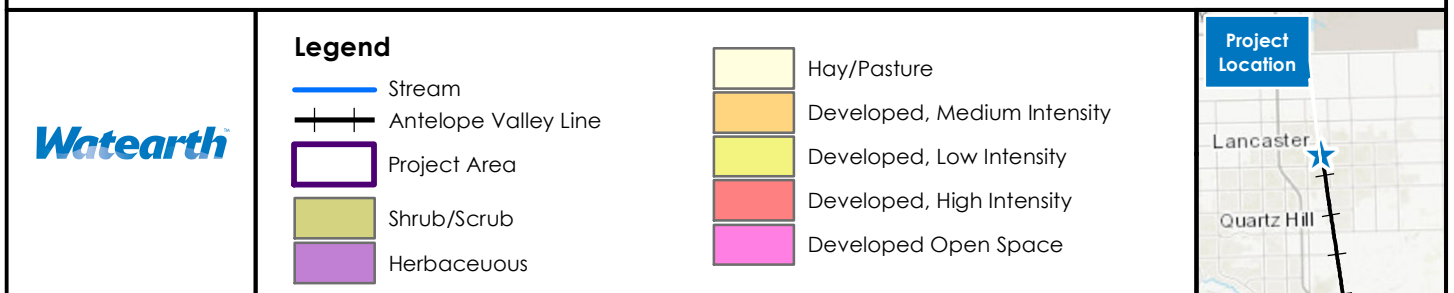
Exhibit 18 - Lancaster Terminal Improvements FEMA Floodplain Map

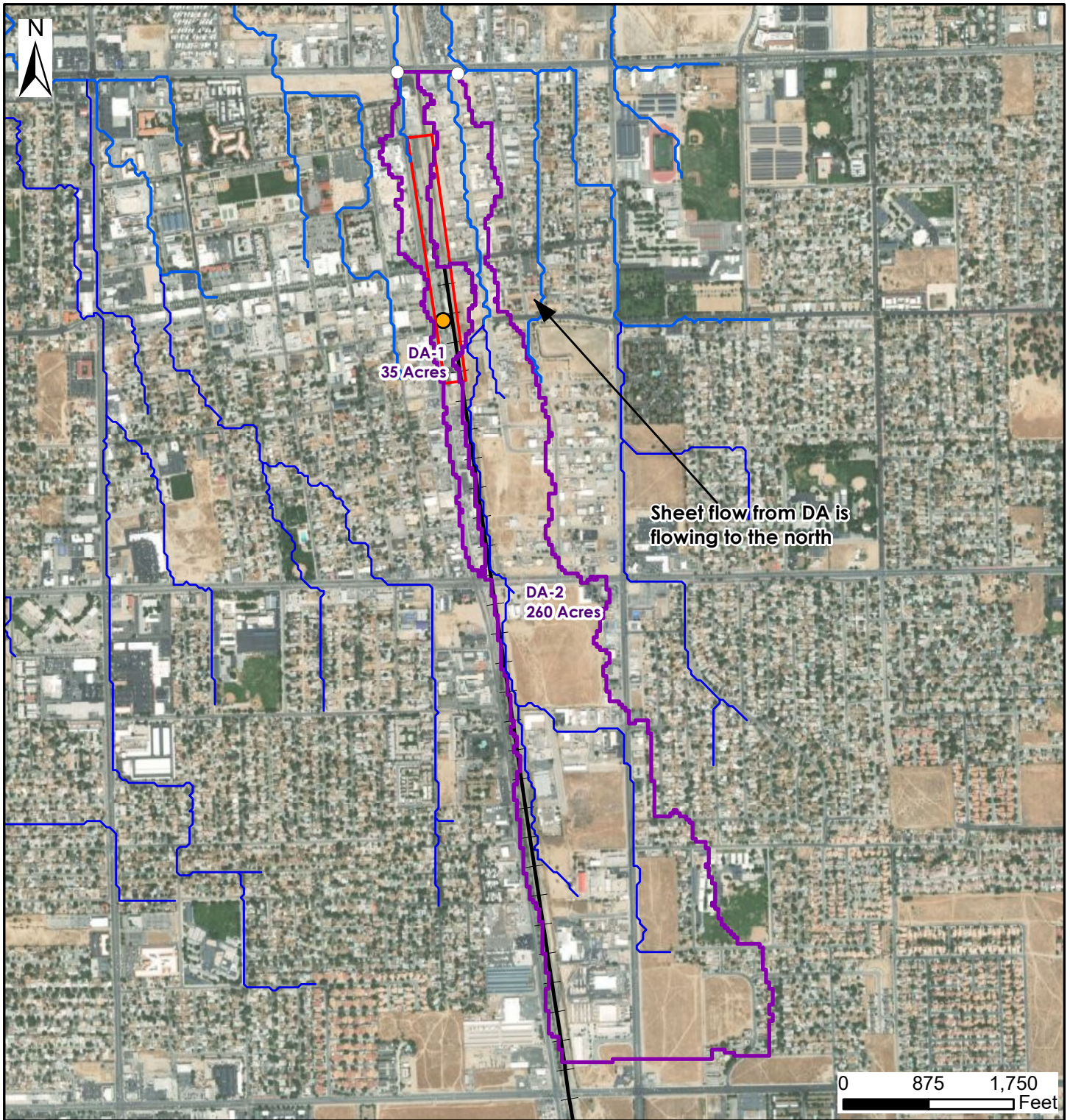
	Legend	FEMA Floodplain	
	<ul style="list-style-type: none"> Antelope Valley Line Stream Project Area 		



Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

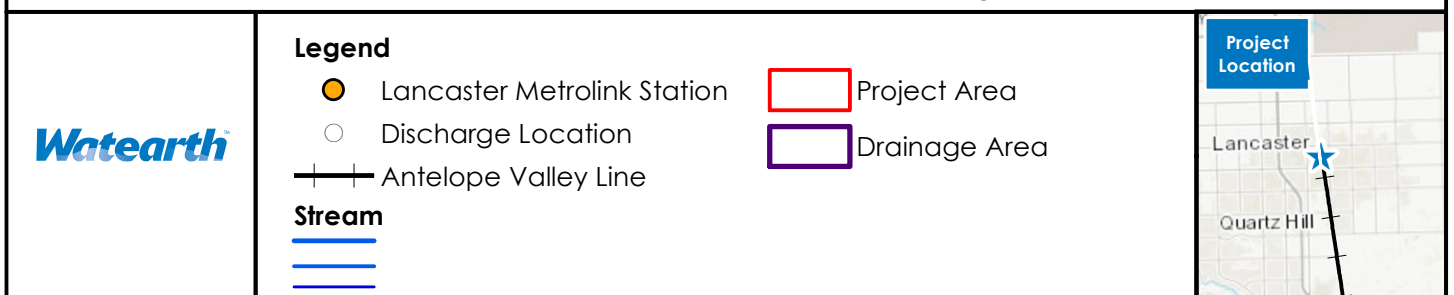
Exhibit 19 - Lancaster Terminal Improvements Land Cover Map

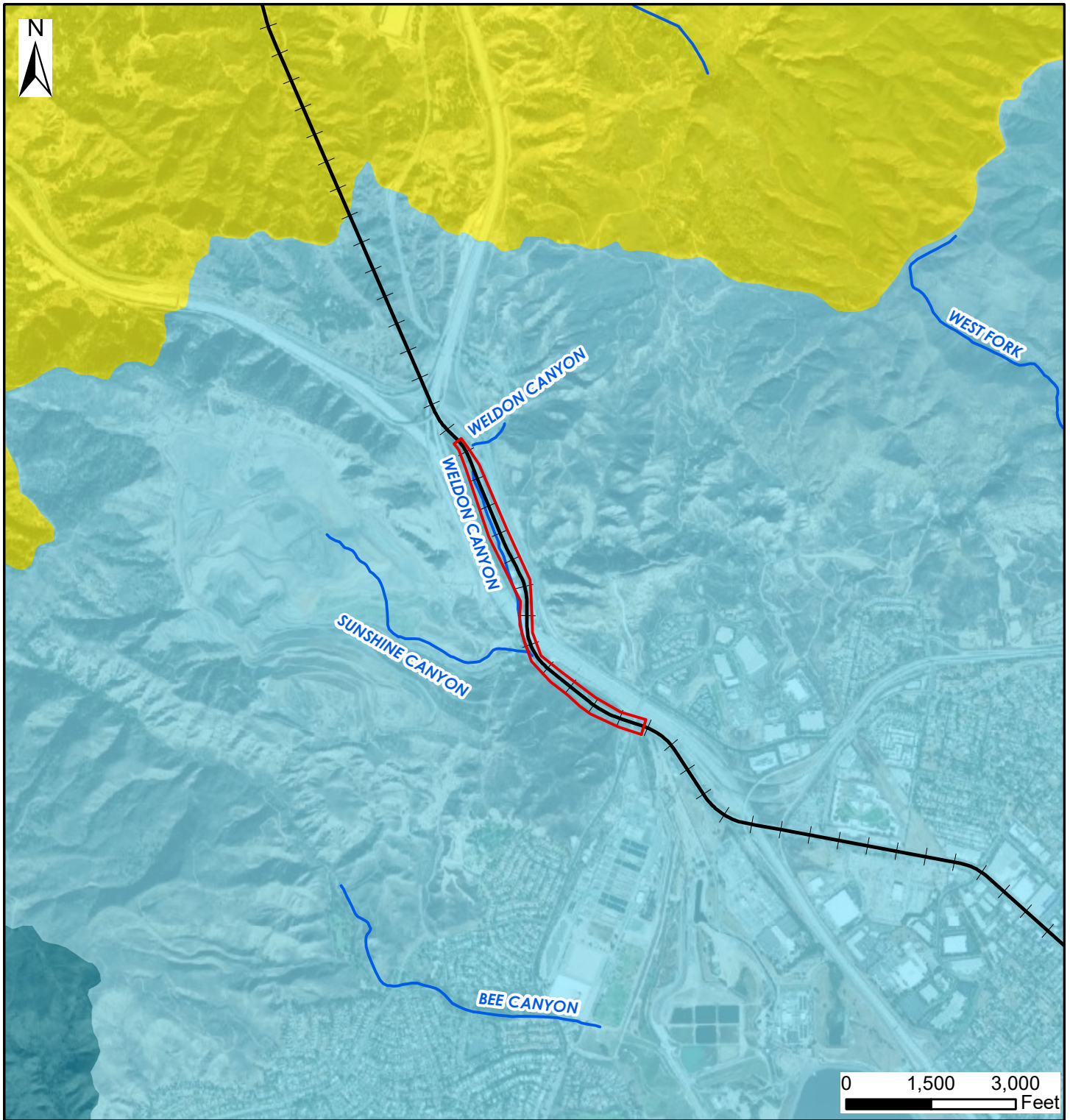




Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 20 - Lancaster Terminal Improvements Drainage Area Map

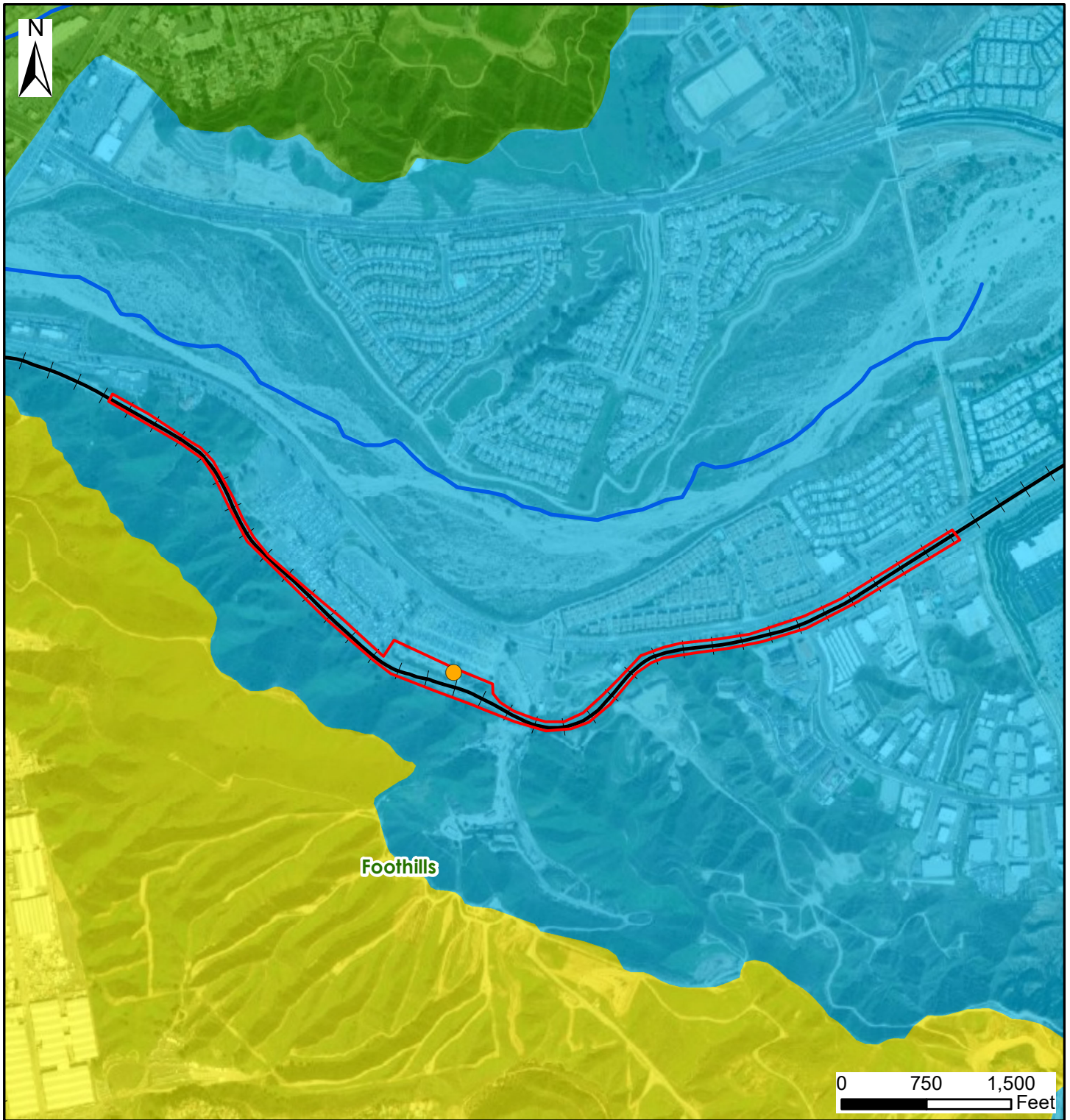




Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 21 - Balboa Double Track Extension Watershed Map

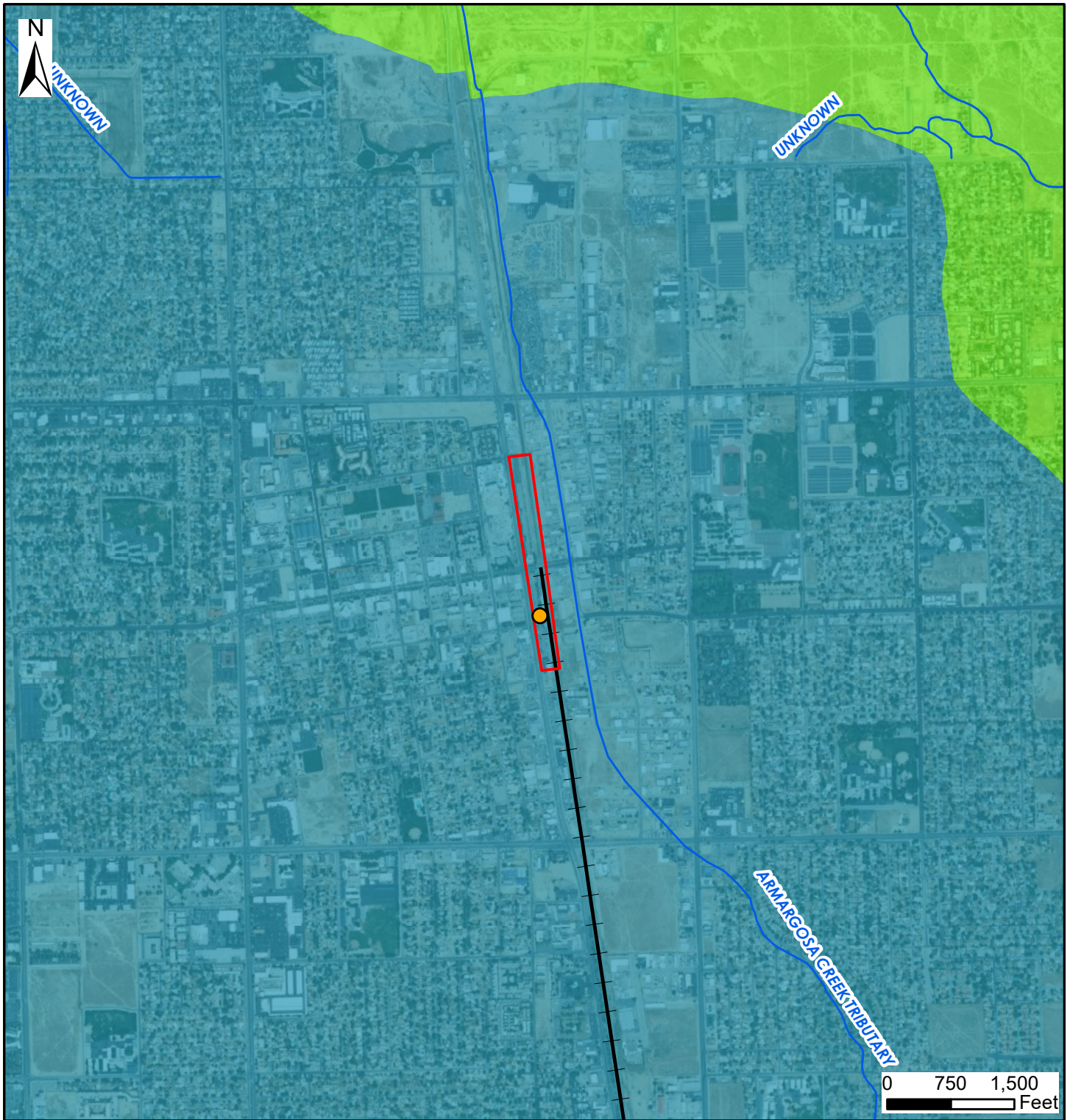
	Legend		
	<ul style="list-style-type: none"> Antelope Valley Line Stream Project Area 	Watershed <ul style="list-style-type: none"> Aliso Canyon Wash Bull Creek South Fork Santa Clara River 	



Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 22 - Canyon Siding Extension Watershed Map

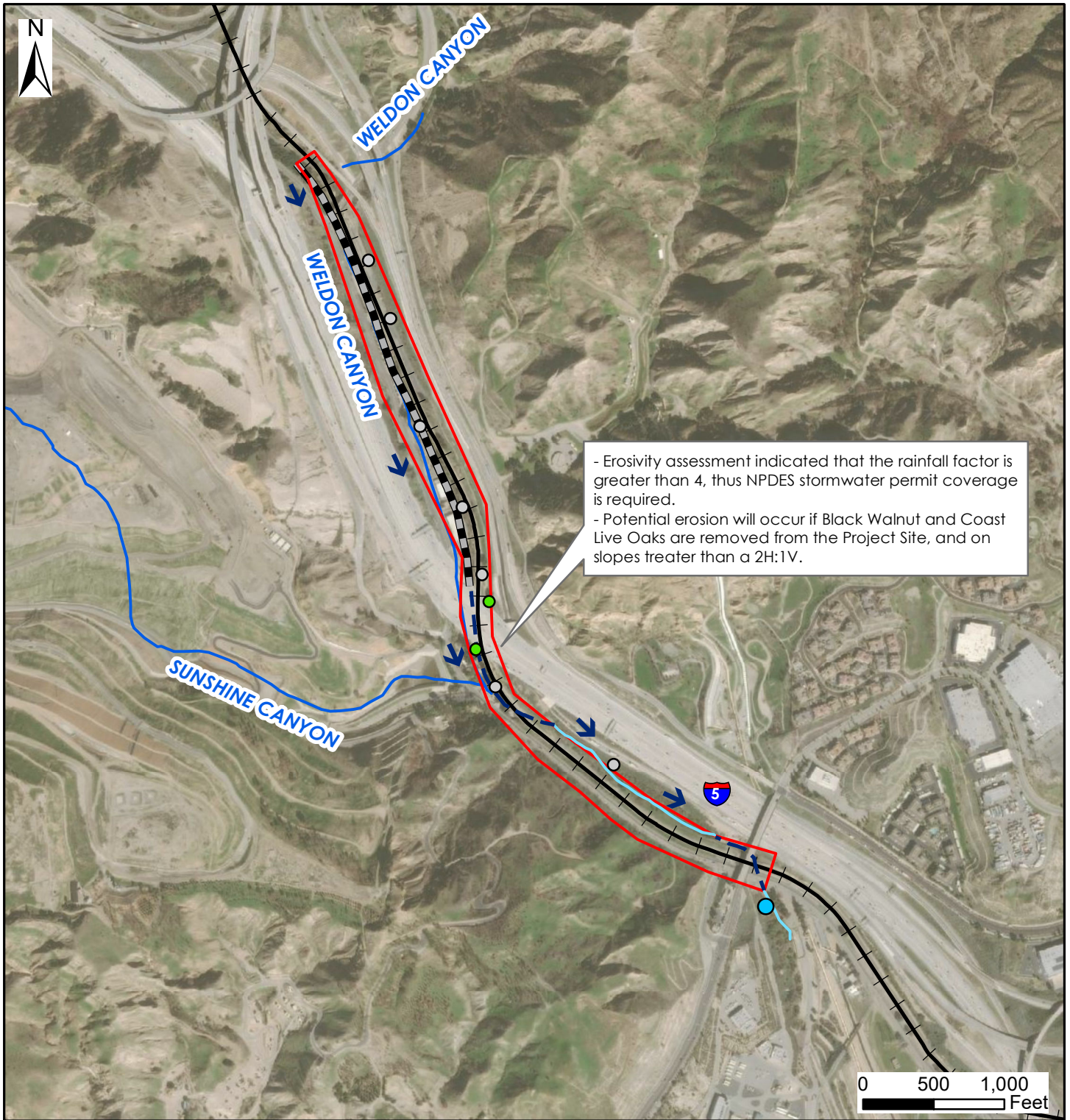
	Legend		
	<ul style="list-style-type: none"> ● Santa Clarita Metrolink Station Antelope Valley Line Stream Project Area 	Watershed <ul style="list-style-type: none"> Lower Bouquet Canyon Sand Canyon-Santa Clara River South Fork Santa Clara River 	



Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 23 - Lancaster Terminal Improvements Watershed Map

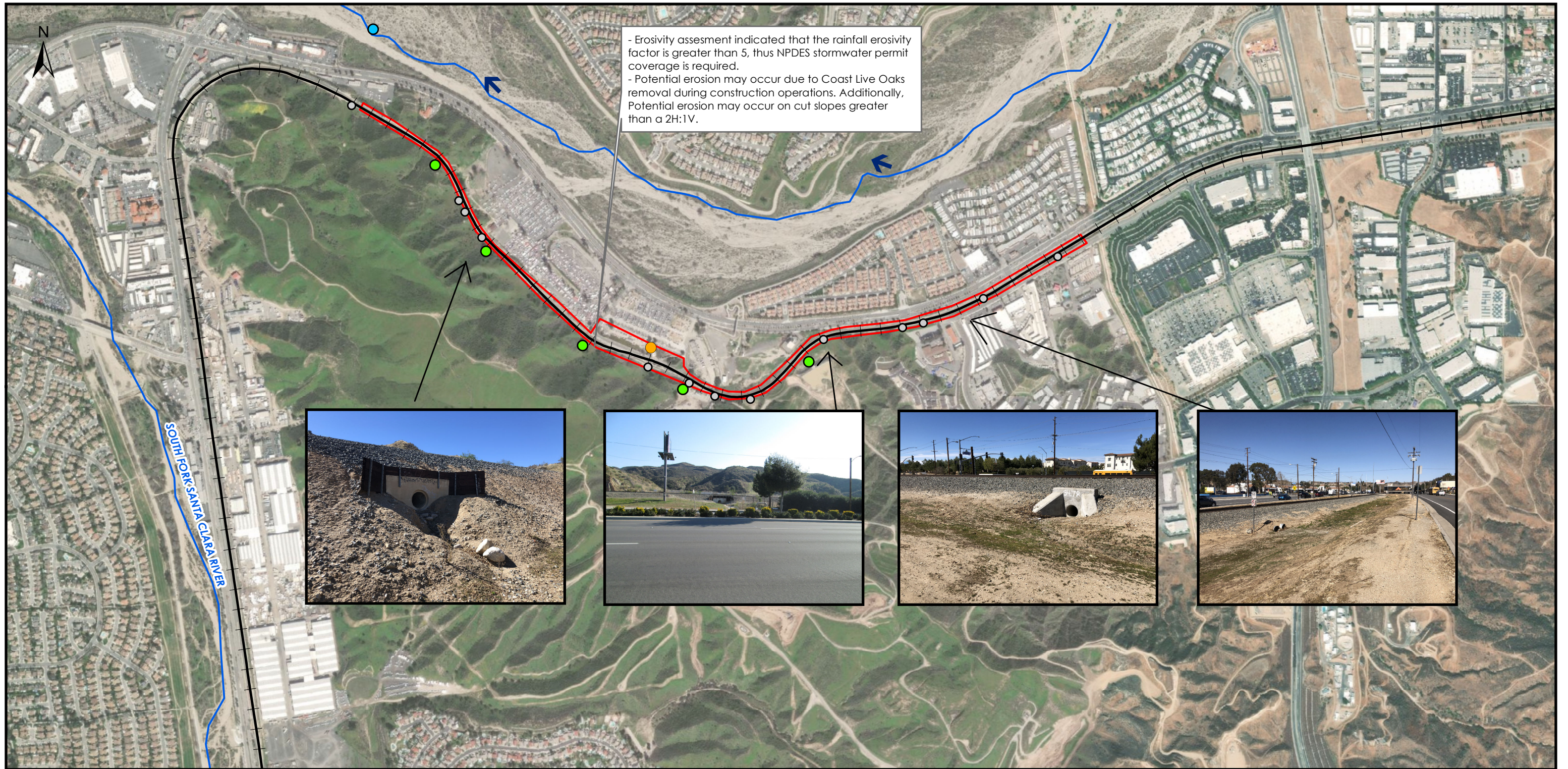
	<p>Legend</p> <ul style="list-style-type: none"> Lancaster Metrolink Station Antelope Valley Line Stream Project Area 		<p>Watershed</p> <ul style="list-style-type: none"> Middle Amargosa Creek Upper Amargosa Creek 	<p>Project Location</p>
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Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 24- Balboa Double Track Extension Erosion Map

	Legend		
	<ul style="list-style-type: none"> ○ Discharge Location ○ Existing Outfall ● Grading Area ↓ Flow Direction Arrow —+— Antelope Valley Line 	<ul style="list-style-type: none"> — Stream — Earthen Stream - - - Closed Channel —+— Concrete Channel □ Project Area 	



Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program
Exhibit 25 - Canyon Siding Extension Erosion Map

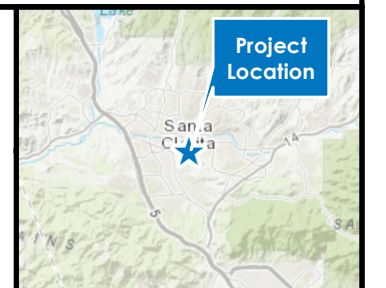


Legend

- Santa Clarita Metrolink Station
- Discharge Location
- Existing Outfall
- Grading Areas
- ↓ Flow Direction
- Antelope Valley Line
- Earthen Stream
- Project Area

Datum: NAD83
 Units: US Feet

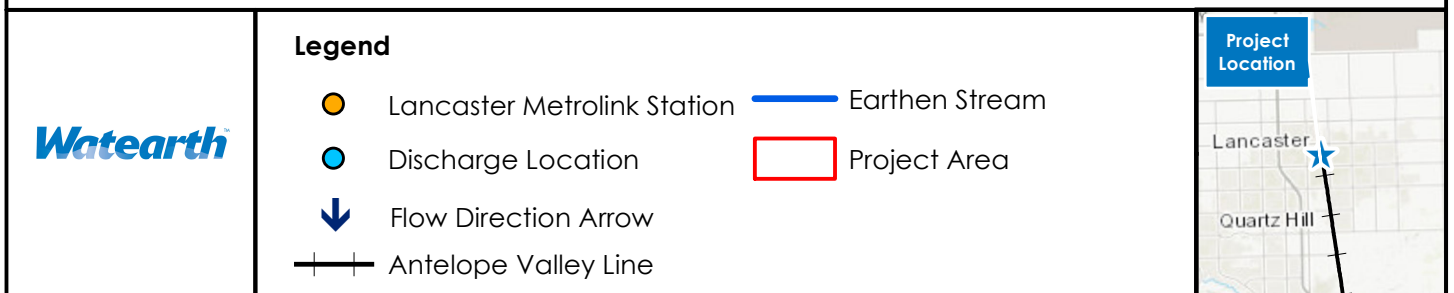
1 inch = 1,000 feet

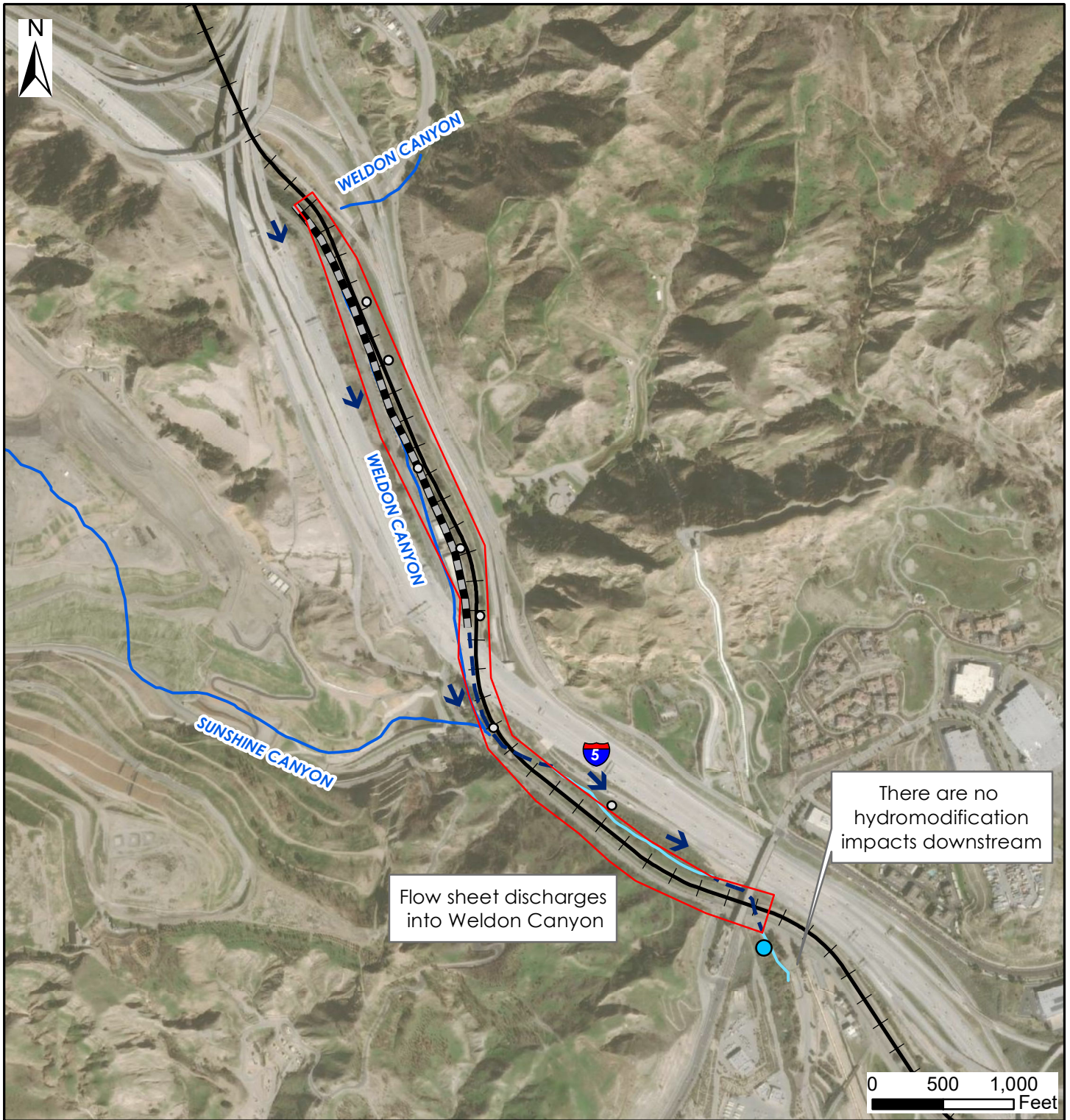




Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

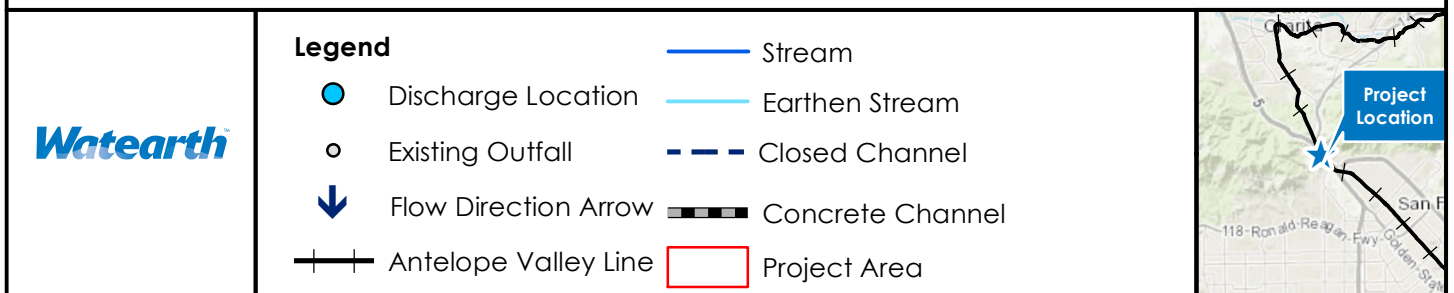
Exhibit 26 - Lancaster Terminal Improvements Erosion Map

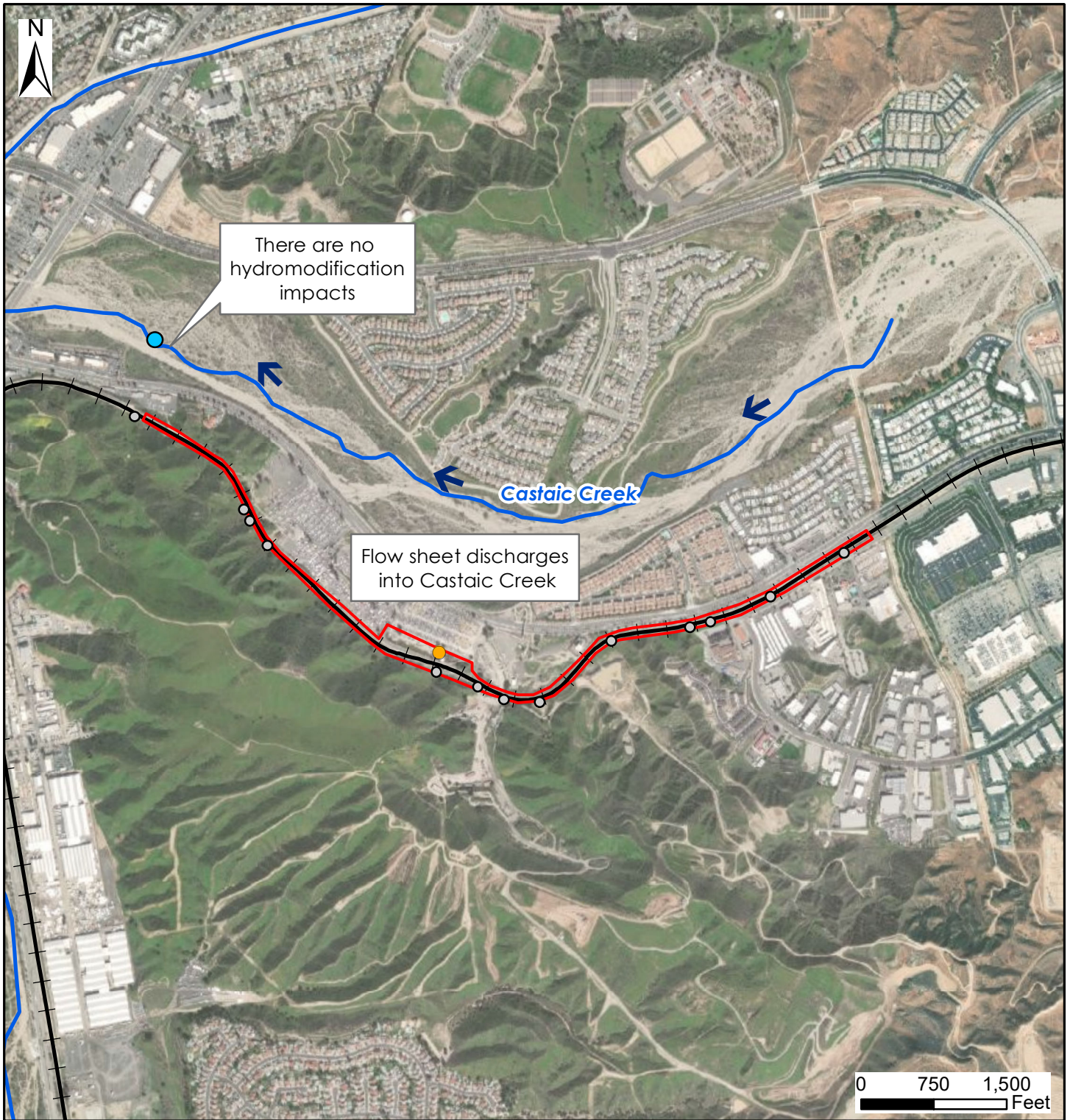




Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 27 - Balboa Double Track Extension Hydromodification Map





Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

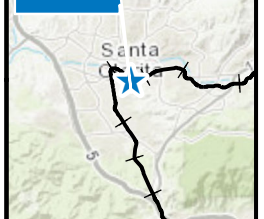
Exhibit 28 - Canyon Siding Extension Hydromodification Map



Legend

- Discharge Location
- Santa Clarita Metrolink Station
- Existing Outfall
- ↓ Flow Direction Arrow
- | Antelope Valley Line
- Earthen Stream
- Project Area

Project Location





Los Angeles County Metropolitan Transportation Authority Antelope Valley Line Capacity and Service Improvements Program

Exhibit 29 - Lancaster Terminal Improvements Hydromodification Map

	Legend		
	<ul style="list-style-type: none"> Lancaster Metrolink Station Discharge Location Flow Direction Arrow Antelope Valley Line 	<ul style="list-style-type: none"> Earthen Stream Project Area 	



Water Resources and Hydrology Technical Memo

Antelope Valley Line

Appendix A

Rainfall Data

Frequency	Multiplication Factor
2-Year	0.387
5-Year	0.584
10-Year	0.714
25-Year	0.878
50-Year	1
100-Year	1.122
200-Year	1.192

Frequency	Isohyetal Depth (in)
2-Year	3.02
5-Year	4.56
10-Year	5.57
25-Year	6.85
50-Year	7.80
100-Year	8.75
200-Year	9.30

50yr Two Tenths (Rainfall)	7.8 in
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<https://dpw.lacounty.gov/wrd/hydrologygis/>

Project Site: Balboa Double Track Extension
 (closest) Address: 14747 San Fernando Rd, Sylmar, CA 91342

Time	Depth	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	200-Year
Minutes	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
0	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.011111	0.0335	0.0506	0.0619	0.0761	0.0867	0.0972	0.1033
60	0.022361	0.0675	0.1019	0.1245	0.1531	0.1744	0.1957	0.2079
90	0.033758	0.1019	0.1538	0.1880	0.2312	0.2633	0.2954	0.3139
120	0.045307	0.1368	0.2064	0.2523	0.3103	0.3534	0.3965	0.4212
150	0.057015	0.1721	0.2597	0.3175	0.3905	0.4447	0.4990	0.5301
180	0.068889	0.2079	0.3138	0.3837	0.4718	0.5373	0.6029	0.6405
210	0.080937	0.2443	0.3687	0.4508	0.5543	0.6313	0.7083	0.7525
240	0.093166	0.2812	0.4244	0.5189	0.6380	0.7267	0.8154	0.8662
270	0.105586	0.3187	0.4810	0.5880	0.7231	0.8236	0.9240	0.9817
300	0.118206	0.3568	0.5385	0.6583	0.8095	0.9220	1.0345	1.0990
330	0.131037	0.3955	0.5969	0.7298	0.8974	1.0221	1.1468	1.2183
360	0.14409	0.4350	0.6564	0.8025	0.9868	1.1239	1.2610	1.3397
390	0.157377	0.4751	0.7169	0.8765	1.0778	1.2275	1.3773	1.4632
420	0.170913	0.5159	0.7785	0.9518	1.1705	1.3331	1.4958	1.5891
450	0.184711	0.5576	0.8414	1.0287	1.2650	1.4407	1.6165	1.7174
480	0.19879	0.6001	0.9055	1.1071	1.3614	1.5506	1.7397	1.8483
510	0.213168	0.6439	0.9717	1.1880	1.4609	1.6639	1.8669	1.9833
540	0.227865	0.6878	1.0380	1.2690	1.5605	1.7773	1.9942	2.1186
570	0.242905	0.7332	1.1065	1.3528	1.6635	1.8947	2.1258	2.2584
600	0.258314	0.7797	1.1767	1.4386	1.7690	2.0148	2.2607	2.4017
630	0.274121	0.8275	1.2487	1.5266	1.8773	2.1381	2.3990	2.5487
660	0.290362	0.8765	1.3227	1.6171	1.9885	2.2648	2.5411	2.6997
690	0.307075	0.9269	1.3988	1.7102	2.1030	2.3952	2.6874	2.8551
720	0.323307	0.9759	1.4727	1.8006	2.2141	2.5218	2.8295	3.0060
750	0.342111	1.0327	1.5584	1.9053	2.3429	2.6685	2.9940	3.1808
780	0.360552	1.0884	1.6424	2.0080	2.4692	2.8123	3.1554	3.3523
810	0.379705	1.1462	1.7296	2.1147	2.6004	2.9617	3.3230	3.5303
840	0.399666	1.2064	1.8206	2.2258	2.7371	3.1174	3.4977	3.7159
870	0.420552	1.2695	1.9157	2.3421	2.8801	3.2803	3.6805	3.9101
900	0.442511	1.3358	2.0157	2.4644	3.0305	3.4516	3.8727	4.1143
930	0.465738	1.4059	2.1215	2.5938	3.1896	3.6328	4.0760	4.3302
960	0.490493	1.4806	2.2343	2.7317	3.3591	3.8258	4.2926	4.5604
970	0.499144	1.5067	2.2737	2.7798	3.4183	3.8933	4.3683	4.6408
980	0.508022	1.5335	2.3141	2.8293	3.4791	3.9626	4.4460	4.7234
990	0.517145	1.5611	2.3557	2.8801	3.5416	4.0337	4.5258	4.8082
1000	0.526538	1.5894	2.3985	2.9324	3.6059	4.1070	4.6080	4.8955
1010	0.536225	1.6186	2.4426	2.9863	3.6723	4.1826	4.6928	4.9856
1020	0.546239	1.6489	2.4882	3.0421	3.7409	4.2607	4.7805	5.0787
1030	0.556617	1.6802	2.5355	3.0999	3.8119	4.3416	4.8713	5.1752
1040	0.567402	1.7128	2.5846	3.1600	3.8858	4.4257	4.9657	5.2755
1050	0.578651	1.7467	2.6359	3.2226	3.9628	4.5135	5.0641	5.3801
1060	0.590431	1.7823	2.6895	3.2882	4.0435	4.6054	5.1672	5.4896
1070	0.60283	1.8197	2.7460	3.3573	4.1284	4.7021	5.2757	5.6049
1080	0.615962	1.8593	2.8058	3.4304	4.2184	4.8045	5.3907	5.7270
1090	0.629985	1.9017	2.8697	3.5085	4.3144	4.9139	5.5134	5.8573
1100	0.645118	1.9474	2.9386	3.5928	4.4180	5.0319	5.6458	5.9980
1110	0.661694	1.9974	3.0141	3.6851	4.5315	5.1612	5.7909	6.1522
1115	0.67068	2.0245	3.0551	3.7352	4.5931	5.2313	5.8695	6.2357
1120	0.680257	2.0534	3.0987	3.7885	4.6587	5.3060	5.9533	6.3248
1125	0.690568	2.0845	3.1457	3.8459	4.7293	5.3864	6.0436	6.4206
1130	0.701824	2.1185	3.1969	3.9086	4.8064	5.4742	6.1421	6.5253
1135	0.714364	2.1564	3.2541	3.9784	4.8923	5.5720	6.2518	6.6419
1136	0.717072	2.1646	3.2664	3.9935	4.9108	5.5932	6.2755	6.6670
1137	0.71986	2.1730	3.2791	4.0090	4.9299	5.6149	6.2999	6.6930
1138	0.722738	2.1817	3.2922	4.0251	4.9496	5.6374	6.3251	6.7197
1139	0.725713	2.1906	3.3058	4.0416	4.9700	5.6606	6.3511	6.7474
1140	0.728799	2.2000	3.3198	4.0588	4.9911	5.6846	6.3782	6.7761
1145	0.746492	2.2534	3.4004	4.1574	5.1123	5.8226	6.5330	6.9406
1150	0.772454	2.3317	3.5187	4.3020	5.2901	6.0251	6.7602	7.1820
1151	0.780923	2.3573	3.5573	4.3491	5.3481	6.0912	6.8343	7.2607
1152	0.8	2.4149	3.6442	4.4554	5.4787	6.2400	7.0013	7.4381
1153	0.809944	2.4449	3.6895	4.5107	5.5468	6.3176	7.0883	7.5305
1154	0.814358	2.4582	3.7096	4.5353	5.5770	6.3520	7.1269	7.5716
1155	0.8178	2.4686	3.7252	4.5545	5.6006	6.3788	7.1571	7.6036
1156	0.820732	2.4775	3.7386	4.5708	5.6207	6.4017	7.1827	7.6308
1157	0.823335	2.4853	3.7505	4.5853	5.6385	6.4220	7.2055	7.6550
1158	0.825702	2.4925	3.7612	4.5985	5.6547	6.4405	7.2262	7.6770
1159	0.82789	2.4991	3.7712	4.6107	5.6697	6.4575	7.2454	7.6974
1160	0.829936	2.5052	3.7805	4.6221	5.6837	6.4735	7.2633	7.7164
1161	0.831864	2.5111	3.7893	4.6328	5.6969	6.4885	7.2801	7.7343
1162	0.833694	2.5166	3.7976	4.6430	5.7095	6.5028	7.2962	7.7514
1163	0.83544	2.5219	3.8056	4.6527	5.7214	6.5164	7.3114	7.7676
1164	0.837112	2.5269	3.8132	4.6620	5.7329	6.5295	7.3261	7.7831
1165	0.838721	2.5318	3.8205	4.6710	5.7439	6.5420	7.3402	7.7981

Antelope Valley Line Capacity and Service Improvements Program
 Balboa Double Track Extension
 Rainfall Data

Waterth Inc.
 Project #21-019.0

1166	0.840272	2.5364	3.8276	4.6796	5.7545	6.5541	7.3537	7.8125
1167	0.841772	2.5410	3.8344	4.6880	5.7648	6.5658	7.3669	7.8265
1168	0.843225	2.5454	3.8411	4.6961	5.7747	6.5772	7.3796	7.8400
1169	0.844636	2.5496	3.8475	4.7039	5.7844	6.5882	7.3919	7.8531
1170	0.846009	2.5538	3.8537	4.7116	5.7938	6.5989	7.4039	7.8659
1171	0.847347	2.5578	3.8598	4.7190	5.8030	6.6093	7.4156	7.8783
1172	0.848652	2.5617	3.8658	4.7263	5.8119	6.6195	7.4271	7.8904
1173	0.849926	2.5656	3.8716	4.7334	5.8206	6.6294	7.4382	7.9023
1174	0.851172	2.5693	3.8773	4.7403	5.8292	6.6391	7.4491	7.9139
1175	0.852392	2.5730	3.8828	4.7471	5.8375	6.6487	7.4598	7.9252
1176	0.853588	2.5766	3.8883	4.7538	5.8457	6.6580	7.4703	7.9363
1177	0.85476	2.5802	3.8936	4.7603	5.8537	6.6671	7.4805	7.9472
1178	0.85591	2.5836	3.8988	4.7667	5.8616	6.6761	7.4906	7.9579
1179	0.857039	2.5871	3.9040	4.7730	5.8693	6.6849	7.5005	7.9684
1180	0.858149	2.5904	3.9090	4.7792	5.8769	6.6936	7.5102	7.9787
1181	0.859241	2.5937	3.9140	4.7853	5.8844	6.7021	7.5197	7.9889
1182	0.860315	2.5969	3.9189	4.7913	5.8918	6.7105	7.5291	7.9989
1183	0.861372	2.6001	3.9237	4.7972	5.8990	6.7187	7.5384	8.0087
1184	0.862414	2.6033	3.9285	4.8030	5.9062	6.7268	7.5475	8.0184
1185	0.86344	2.6064	3.9331	4.8087	5.9132	6.7348	7.5565	8.0279
1186	0.864452	2.6094	3.9378	4.8143	5.9201	6.7427	7.5653	8.0373
1187	0.86545	2.6124	3.9423	4.8199	5.9269	6.7505	7.5741	8.0466
1188	0.866434	2.6154	3.9468	4.8253	5.9337	6.7582	7.5827	8.0558
1189	0.867406	2.6184	3.9512	4.8308	5.9403	6.7658	7.5912	8.0648
1190	0.868366	2.6212	3.9556	4.8361	5.9469	6.7733	7.5996	8.0737
1191	0.869313	2.6241	3.9599	4.8414	5.9534	6.7806	7.6079	8.0825
1192	0.87025	2.6269	3.9642	4.8466	5.9598	6.7880	7.6161	8.0912
1193	0.871175	2.6297	3.9684	4.8517	5.9662	6.7952	7.6242	8.0998
1194	0.87209	2.6325	3.9725	4.8568	5.9724	6.8023	7.6322	8.1083
1195	0.872995	2.6352	3.9767	4.8619	5.9786	6.8094	7.6401	8.1168
1196	0.873889	2.6379	3.9807	4.8669	5.9847	6.8163	7.6479	8.1251
1197	0.874775	2.6406	3.9848	4.8718	5.9908	6.8232	7.6557	8.1333
1198	0.875651	2.6432	3.9888	4.8767	5.9968	6.8301	7.6633	8.1415
1199	0.876518	2.6459	3.9927	4.8815	6.0027	6.8368	7.6709	8.1495
1200	0.877377	2.6485	3.9966	4.8863	6.0086	6.8435	7.6785	8.1575
1201	0.879227	2.6540	4.0051	4.8966	6.0213	6.8580	7.6946	8.1747
1202	0.879069	2.6536	4.0043	4.8957	6.0202	6.8567	7.6933	8.1732
1203	0.879903	2.6561	4.0081	4.9004	6.0259	6.8632	7.7006	8.1810
1204	0.88073	2.6586	4.0119	4.9050	6.0316	6.8697	7.7078	8.1887
1205	0.881549	2.6610	4.0156	4.9095	6.0372	6.8761	7.7150	8.1963
1206	0.882361	2.6635	4.0193	4.9140	6.0428	6.8824	7.7221	8.2038
1207	0.883166	2.6659	4.0230	4.9185	6.0483	6.8887	7.7291	8.2113
1208	0.883964	2.6683	4.0266	4.9230	6.0537	6.8949	7.7361	8.2187
1209	0.884755	2.6707	4.0302	4.9274	6.0592	6.9011	7.7430	8.2261
1210	0.88554	2.6731	4.0338	4.9317	6.0645	6.9072	7.7499	8.2334
1211	0.886318	2.6754	4.0374	4.9361	6.0699	6.9133	7.7567	8.2406
1212	0.887091	2.6778	4.0409	4.9404	6.0752	6.9193	7.7635	8.2478
1213	0.887857	2.6801	4.0444	4.9447	6.0804	6.9253	7.7702	8.2549
1214	0.888618	2.6824	4.0478	4.9489	6.0856	6.9312	7.7768	8.2620
1215	0.889372	2.6847	4.0513	4.9531	6.0908	6.9371	7.7834	8.2690
1216	0.890121	2.6869	4.0547	4.9573	6.0959	6.9429	7.7900	8.2760
1217	0.890865	2.6892	4.0581	4.9614	6.1010	6.9487	7.7965	8.2829
1218	0.891603	2.6914	4.0614	4.9655	6.1061	6.9545	7.8030	8.2898
1219	0.892336	2.6936	4.0648	4.9696	6.1111	6.9602	7.8094	8.2966
1220	0.893064	2.6958	4.0681	4.9737	6.1161	6.9659	7.8157	8.3034
1221	0.893787	2.6980	4.0714	4.9777	6.1210	6.9715	7.8221	8.3101
1222	0.894505	2.7002	4.0746	4.9817	6.1259	6.9771	7.8283	8.3167
1223	0.895218	2.7023	4.0779	4.9856	6.1308	6.9827	7.8346	8.3234
1224	0.895926	2.7044	4.0811	4.9896	6.1357	6.9882	7.8408	8.3300
1225	0.89663	2.7066	4.0843	4.9935	6.1405	6.9937	7.8469	8.3365
1226	0.89733	2.7087	4.0875	4.9974	6.1453	6.9992	7.8531	8.3430
1227	0.898024	2.7108	4.0907	5.0013	6.1500	7.0046	7.8591	8.3495
1228	0.898715	2.7129	4.0938	5.0051	6.1548	7.0100	7.8652	8.3559
1229	0.899401	2.7149	4.0970	5.0089	6.1595	7.0153	7.8712	8.3623
1230	0.900083	2.7170	4.1001	5.0127	6.1641	7.0206	7.8772	8.3686
1231	0.900761	2.7190	4.1031	5.0165	6.1688	7.0259	7.8831	8.3749
1232	0.901435	2.7211	4.1062	5.0203	6.1734	7.0312	7.8890	8.3812
1233	0.902105	2.7231	4.1093	5.0240	6.1780	7.0364	7.8949	8.3874
1234	0.902772	2.7251	4.1123	5.0277	6.1825	7.0416	7.9007	8.3936
1235	0.903434	2.7271	4.1153	5.0314	6.1871	7.0468	7.9065	8.3998
1240	0.906691	2.7369	4.1302	5.0495	6.2094	7.0722	7.9350	8.4301
1245	0.909862	2.7465	4.1446	5.0672	6.2311	7.0969	7.9627	8.4595
1250	0.912954	2.7558	4.1587	5.0844	6.2523	7.1210	7.9898	8.4883
1255	0.915973	2.7650	4.1724	5.1012	6.2729	7.1446	8.0162	8.5164
1260	0.918923	2.7739	4.1859	5.1177	6.2932	7.1676	8.0420	8.5438
1265	0.92181	2.7826	4.1990	5.1337	6.3129	7.1901	8.0673	8.5706
1270	0.924638	2.7911	4.2119	5.1495	6.3323	7.2122	8.0921	8.5969
1275	0.927409	2.7995	4.2245	5.1649	6.3513	7.2338	8.1163	8.6227
1280	0.930129	2.8077	4.2369	5.1801	6.3699	7.2550	8.1401	8.6480
1285	0.932799	2.8157	4.2491	5.1949	6.3882	7.2758	8.1635	8.6728
1290	0.935422	2.8237	4.2610	5.2096	6.4061	7.2963	8.1864	8.6972
1295	0.938	2.8314	4.2728	5.2239	6.4238	7.3164	8.2090	8.7211
1300	0.940537	2.8391	4.2843	5.2380	6.4412	7.3362	8.2312	8.7447
1305	0.943034	2.8466	4.2957	5.2519	6.4583	7.3557	8.2531	8.7680
1310	0.945492	2.8541	4.3069	5.2656	6.4751	7.3748	8.2746	8.7908
1315	0.947915	2.8614	4.3179	5.2791	6.4917	7.3937	8.2958	8.8133
1320	0.950302	2.8686	4.3288	5.2924	6.5080	7.4124	8.3167	8.8355
1325	0.952657	2.8757	4.3395	5.3055	6.5242	7.4307	8.3373	8.8574
1330	0.95498	2.8827	4.3501	5.3185	6.5401	7.4488	8.3576	8.8790
1335	0.957272	2.8896	4.3606	5.3312	6.5558	7.4667	8.3777	8.9003

Antelope Valley Line Capacity and Service Improvements Program
 Balboa Double Track Extension
 Rainfall Data

Waterth Inc.
 Project #21-019.0

1340	0.959535	2.8965	4.3709	5.3438	6.5713	7.4844	8.3975	8.9214
1345	0.96177	2.9032	4.3811	5.3563	6.5866	7.5018	8.4170	8.9422
1350	0.963978	2.9099	4.3911	5.3686	6.6017	7.5190	8.4363	8.9627
1355	0.966159	2.9164	4.4010	5.3807	6.6166	7.5360	8.4554	8.9830
1360	0.968316	2.9230	4.4109	5.3927	6.6314	7.5529	8.4743	9.0030
1365	0.970448	2.9294	4.4206	5.4046	6.6460	7.5695	8.4930	9.0228
1370	0.972558	2.9358	4.4302	5.4164	6.6605	7.5860	8.5114	9.0425
1375	0.974644	2.9421	4.4397	5.4280	6.6748	7.6022	8.5297	9.0619
1380	0.976709	2.9483	4.4491	5.4395	6.6889	7.6183	8.5478	9.0810
1385	0.978752	2.9545	4.4584	5.4509	6.7029	7.6343	8.5656	9.1000
1390	0.980775	2.9606	4.4676	5.4621	6.7167	7.6500	8.5834	9.1189
1395	0.982778	2.9666	4.4768	5.4733	6.7305	7.6657	8.6009	9.1375
1400	0.984761	2.9726	4.4858	5.4843	6.7440	7.6811	8.6182	9.1559
1405	0.986726	2.9785	4.4947	5.4953	6.7575	7.6965	8.6354	9.1742
1410	0.988673	2.9844	4.5036	5.5061	6.7708	7.7116	8.6525	9.1923
1415	0.990602	2.9902	4.5124	5.5169	6.7840	7.7267	8.6694	9.2102
1420	0.992514	2.9960	4.5211	5.5275	6.7971	7.7416	8.6861	9.2280
1425	0.99441	3.0017	4.5297	5.5381	6.8101	7.7564	8.7027	9.2456
1430	0.996289	3.0074	4.5383	5.5485	6.8230	7.7711	8.7191	9.2631
1435	0.998152	3.0130	4.5468	5.5589	6.8357	7.7856	8.7354	9.2804
1440	1	3.0186	4.5552	5.5692	6.8484	7.8000	8.7516	9.2976

Frequency	Multiplication Factor
2-Year	0.387
5-Year	0.584
10-Year	0.714
25-Year	0.878
50-Year	1
100-Year	1.122
200-Year	1.192

Frequency	Isohyetal Depth (in)
2-Year	2.71
5-Year	4.09
10-Year	5.00
25-Year	6.15
50-Year	7.00
100-Year	7.85
200-Year	8.34

50Yr Two Tenths (Rainfall)	7. in
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<https://dpw.lacounty.gov/wrd/hydrologygis/>

Project Site: Canyon Siding Extension
 (closest) Address: 22116 Soledad Canyon Road, Santa Clarita, CA, 9135C

Time	Depth	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	200-Year
Minutes	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
0	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.01111	0.0301	0.0454	0.0555	0.0683	0.0778	0.0873	0.0927
60	0.022361	0.0606	0.0914	0.1118	0.1374	0.1565	0.1756	0.1866
90	0.033758	0.0915	0.1380	0.1687	0.2075	0.2363	0.2651	0.2817
120	0.045307	0.1227	0.1852	0.2264	0.2785	0.3171	0.3558	0.3780
150	0.057015	0.1545	0.2331	0.2850	0.3504	0.3991	0.4478	0.4757
180	0.068889	0.1866	0.2816	0.3443	0.4234	0.4822	0.5411	0.5748
210	0.080937	0.2193	0.3309	0.4045	0.4974	0.5666	0.6357	0.6753
240	0.093166	0.2524	0.3809	0.4656	0.5726	0.6522	0.7317	0.7774
270	0.105586	0.2860	0.4316	0.5277	0.6489	0.7391	0.8293	0.8810
300	0.118206	0.3202	0.4832	0.5908	0.7265	0.8274	0.9284	0.9863
330	0.131037	0.3550	0.5357	0.6549	0.8054	0.9173	1.0292	1.0934
360	0.14409	0.3903	0.5890	0.7202	0.8856	1.0086	1.1317	1.2023
390	0.157377	0.4263	0.6434	0.7866	0.9672	1.1016	1.2360	1.3132
420	0.170913	0.4630	0.6987	0.8542	1.0504	1.1964	1.3424	1.4261
450	0.184711	0.5004	0.7551	0.9232	1.1352	1.2930	1.4507	1.5412
480	0.19879	0.5385	0.8127	0.9936	1.2218	1.3915	1.5613	1.6587
510	0.213168	0.5779	0.8720	1.0662	1.3110	1.4932	1.6754	1.7799
540	0.227865	0.6173	0.9315	1.1389	1.4005	1.5951	1.7897	1.9013
570	0.242905	0.6580	0.9930	1.2140	1.4929	1.7003	1.9078	2.0268
600	0.258314	0.6998	1.0560	1.2911	1.5876	1.8082	2.0288	2.1554
630	0.274121	0.7426	1.1206	1.3701	1.6847	1.9188	2.1529	2.2873
660	0.290362	0.7866	1.1870	1.4512	1.7846	2.0325	2.2805	2.4228
690	0.307075	0.8319	1.2553	1.5348	1.8873	2.1495	2.4118	2.5622
720	0.323307	0.8758	1.3217	1.6159	1.9870	2.2631	2.5393	2.6977
750	0.342111	0.9268	1.3985	1.7099	2.1026	2.3948	2.6869	2.8546
780	0.360552	0.9767	1.4739	1.8020	2.2160	2.5239	2.8318	3.0084
810	0.379705	1.0286	1.5522	1.8978	2.3337	2.6579	2.9822	3.1683
840	0.399666	1.0827	1.6338	1.9975	2.4563	2.7977	3.1390	3.3348
870	0.420552	1.1393	1.7192	2.1019	2.5847	2.9439	3.3030	3.5091
900	0.442511	1.1988	1.8090	2.2117	2.7197	3.0976	3.4755	3.6923
930	0.465738	1.2617	1.9039	2.3278	2.8624	3.2602	3.6579	3.8861
960	0.490493	1.3287	2.0051	2.4515	3.0146	3.4335	3.8523	4.0927
970	0.499144	1.3522	2.0405	2.4947	3.0677	3.4940	3.9203	4.1649
980	0.508022	1.3762	2.0768	2.5391	3.1223	3.5562	3.9900	4.2389
990	0.517145	1.4009	2.1141	2.5847	3.1784	3.6200	4.0617	4.3151
1000	0.526538	1.4264	2.1525	2.6316	3.2361	3.6858	4.1354	4.3934
1010	0.536225	1.4526	2.1921	2.6801	3.2956	3.7536	4.2115	4.4743
1020	0.5462399	1.4798	2.2330	2.7301	3.3572	3.8237	4.2902	4.5578
1030	0.556617	1.5079	2.2755	2.7820	3.4210	3.8963	4.3717	4.6444
1040	0.567402	1.5371	2.3195	2.8359	3.4873	3.9718	4.4564	4.7344
1050	0.578651	1.5676	2.3655	2.8921	3.5564	4.0506	4.5447	4.8283
1060	0.590431	1.5995	2.4137	2.9510	3.6288	4.1330	4.6372	4.9266
1070	0.60283	1.6331	2.4644	3.0129	3.7050	4.2198	4.7346	5.0300
1080	0.615962	1.6686	2.5181	3.0786	3.7857	4.3117	4.8378	5.1396
1090	0.629985	1.7066	2.5754	3.1487	3.8719	4.4099	4.9479	5.2566
1100	0.645118	1.7476	2.6372	3.2243	3.9649	4.5158	5.0668	5.3829
1110	0.661694	1.7925	2.7050	3.3071	4.0668	4.6319	5.1969	5.5212
1115	0.67068	1.8169	2.7417	3.3521	4.1220	4.6948	5.2675	5.5962
1120	0.680257	1.8428	2.7809	3.3999	4.1809	4.7618	5.3427	5.6761
1125	0.690568	1.8707	2.8230	3.4515	4.2442	4.8340	5.4237	5.7621
1130	0.701824	1.9012	2.8691	3.5077	4.3134	4.9128	5.5121	5.8560
1135	0.714364	1.9352	2.9203	3.5704	4.3905	5.0005	5.6106	5.9607
1136	0.717072	1.9425	2.9314	3.5839	4.4071	5.0195	5.6319	5.9832
1137	0.71986	1.9501	2.9428	3.5979	4.4243	5.0390	5.6538	6.0065
1138	0.722738	1.9579	2.9546	3.6122	4.4419	5.0592	5.6764	6.0305
1139	0.725713	1.9660	2.9667	3.6271	4.4602	5.0800	5.6997	6.0553
1140	0.728799	1.9743	2.9793	3.6425	4.4792	5.1016	5.7240	6.0811
1145	0.746492	2.0222	3.0517	3.7310	4.5879	5.2254	5.8629	6.2287
1150	0.772454	2.0926	3.1578	3.8607	4.7475	5.4072	6.0669	6.4454
1151	0.780923	2.1155	3.1924	3.9031	4.7996	5.4665	6.1334	6.5160
1152	0.8	2.1672	3.2704	3.9984	4.9168	5.6000	6.2832	6.6752
1153	0.809944	2.1941	3.3111	4.0481	4.9779	5.6696	6.3613	6.7582
1154	0.814358	2.2061	3.3291	4.0702	5.0050	5.7005	6.3960	6.7950
1155	0.8178	2.2154	3.3432	4.0874	5.0262	5.7246	6.4230	6.8237
1156	0.820732	2.2234	3.3552	4.1020	5.0442	5.7451	6.4460	6.8482
1157	0.823335	2.2304	3.3658	4.1150	5.0602	5.7633	6.4665	6.8699
1158	0.825702	2.2368	3.3755	4.1269	5.0748	5.7799	6.4851	6.8897
1159	0.82789	2.2428	3.3844	4.1378	5.0882	5.7952	6.5022	6.9079
1160	0.829936	2.2483	3.3928	4.1480	5.1008	5.8096	6.5183	6.9250
1161	0.831864	2.2535	3.4007	4.1577	5.1126	5.8230	6.5335	6.9411
1162	0.833694	2.2585	3.4081	4.1668	5.1239	5.8359	6.5478	6.9563
1163	0.83544	2.2632	3.4153	4.1755	5.1346	5.8481	6.5615	6.9709
1164	0.837112	2.2677	3.4221	4.1839	5.1449	5.8598	6.5747	6.9849
1165	0.838721	2.2721	3.4287	4.1919	5.1548	5.8710	6.5873	6.9983
1166	0.840272	2.2763	3.4350	4.1997	5.1643	5.8819	6.5995	7.0112
1167	0.841772	2.2804	3.4412	4.2072	5.1735	5.8924	6.6113	7.0237
1168	0.843225	2.2843	3.4471	4.2144	5.1825	5.9026	6.6227	7.0359
1169	0.844636	2.2881	3.4529	4.2215	5.1911	5.9125	6.6338	7.0476
1170	0.846009	2.2918	3.4585	4.2284	5.1996	5.9221	6.6446	7.0591
1171	0.847347	2.2955	3.4640	4.2350	5.2078	5.9314	6.6551	7.0703
1172	0.848652	2.2990	3.4693	4.2416	5.2158	5.9406	6.6653	7.0812
1173	0.849926	2.3024	3.4745	4.2479	5.2236	5.9495	6.6753	7.0918

Antelope Valley Line Capacity and Service Improvements Program
 Canyon Siding Extension
 Rainfall Data

Waterth Inc.
 Project #21-019.0

1174	0.851172	2.3058	3.4796	4.2542	5.2313	5.9582	6.6851	7.1022
1175	0.852392	2.3091	3.4846	4.2603	5.2388	5.9667	6.6947	7.1124
1176	0.853588	2.3124	3.4895	4.2662	5.2462	5.9751	6.7041	7.1223
1177	0.85476	2.3155	3.4943	4.2721	5.2534	5.9833	6.7133	7.1321
1178	0.85591	2.3187	3.4990	4.2778	5.2604	5.9914	6.7223	7.1417
1179	0.857039	2.3217	3.5036	4.2835	5.2674	5.9993	6.7312	7.1511
1180	0.858149	2.3247	3.5081	4.2890	5.2742	6.0070	6.7399	7.1604
1181	0.859241	2.3277	3.5126	4.2945	5.2809	6.0147	6.7485	7.1695
1182	0.860315	2.3306	3.5170	4.2999	5.2875	6.0222	6.7569	7.1785
1183	0.861372	2.3335	3.5213	4.3051	5.2940	6.0296	6.7652	7.1873
1184	0.862414	2.3363	3.5255	4.3103	5.3004	6.0369	6.7734	7.1960
1185	0.86344	2.3391	3.5297	4.3155	5.3067	6.0441	6.7815	7.2045
1186	0.864452	2.3418	3.5339	4.3205	5.3129	6.0512	6.7894	7.2130
1187	0.86545	2.3445	3.5380	4.3255	5.3191	6.0582	6.7972	7.2213
1188	0.866434	2.3472	3.5420	4.3304	5.3251	6.0650	6.8050	7.2295
1189	0.867406	2.3498	3.5460	4.3353	5.3311	6.0718	6.8126	7.2376
1190	0.868366	2.3524	3.5499	4.3401	5.3370	6.0786	6.8201	7.2456
1191	0.869313	2.3550	3.5538	4.3448	5.3428	6.0852	6.8276	7.2535
1192	0.87025	2.3575	3.5576	4.3495	5.3486	6.0918	6.8349	7.2614
1193	0.871175	2.3600	3.5614	4.3541	5.3542	6.0982	6.8422	7.2691
1194	0.87209	2.3625	3.5651	4.3587	5.3599	6.1046	6.8494	7.2767
1195	0.872995	2.3649	3.5688	4.3632	5.3654	6.1110	6.8565	7.2843
1196	0.873889	2.3674	3.5725	4.3677	5.3709	6.1172	6.8635	7.2917
1197	0.874775	2.3698	3.5761	4.3721	5.3764	6.1234	6.8705	7.2991
1198	0.875651	2.3721	3.5797	4.3765	5.3818	6.1296	6.8774	7.3064
1199	0.876518	2.3745	3.5832	4.3808	5.3871	6.1356	6.8842	7.3137
1200	0.877377	2.3768	3.5867	4.3851	5.3924	6.1416	6.8909	7.3208
1201	0.879227	2.3818	3.5943	4.3944	5.4037	6.1546	6.9054	7.3363
1202	0.879069	2.3814	3.5936	4.3936	5.4028	6.1535	6.9042	7.3350
1203	0.879903	2.3837	3.5970	4.3978	5.4079	6.1593	6.9108	7.3419
1204	0.88073	2.3859	3.6004	4.4019	5.4130	6.1651	6.9173	7.3488
1205	0.881549	2.3881	3.6038	4.4060	5.4180	6.1708	6.9237	7.3556
1206	0.882361	2.3903	3.6071	4.4100	5.4230	6.1765	6.9301	7.3624
1207	0.883166	2.3925	3.6104	4.4141	5.4279	6.1822	6.9364	7.3691
1208	0.883964	2.3947	3.6136	4.4181	5.4328	6.1877	6.9427	7.3758
1209	0.884755	2.3968	3.6169	4.4220	5.4377	6.1933	6.9489	7.3824
1210	0.88554	2.3989	3.6201	4.4259	5.4425	6.1988	6.9550	7.3889
1211	0.886318	2.4010	3.6233	4.4298	5.4473	6.2042	6.9611	7.3954
1212	0.887091	2.4031	3.6264	4.4337	5.4521	6.2096	6.9672	7.4019
1213	0.887857	2.4052	3.6296	4.4375	5.4568	6.2150	6.9732	7.4083
1214	0.888618	2.4073	3.6327	4.4413	5.4614	6.2203	6.9792	7.4146
1215	0.889372	2.4093	3.6358	4.4451	5.4661	6.2256	6.9851	7.4209
1216	0.890121	2.4113	3.6388	4.4488	5.4707	6.2308	6.9910	7.4272
1217	0.890865	2.4134	3.6419	4.4525	5.4753	6.2361	6.9969	7.4334
1218	0.891603	2.4154	3.6449	4.4562	5.4798	6.2412	7.0026	7.4395
1219	0.892336	2.4173	3.6479	4.4599	5.4843	6.2464	7.0084	7.4457
1220	0.893064	2.4193	3.6508	4.4635	5.4888	6.2514	7.0141	7.4517
1221	0.893787	2.4213	3.6538	4.4671	5.4932	6.2565	7.0198	7.4578
1222	0.894505	2.4232	3.6567	4.4707	5.4976	6.2615	7.0254	7.4637
1223	0.895218	2.4251	3.6597	4.4743	5.5020	6.2665	7.0310	7.4697
1224	0.895926	2.4271	3.6625	4.4778	5.5064	6.2715	7.0366	7.4756
1225	0.89663	2.4290	3.6654	4.4814	5.5107	6.2764	7.0421	7.4815
1226	0.89733	2.4309	3.6683	4.4849	5.5150	6.2813	7.0476	7.4873
1227	0.898024	2.4327	3.6711	4.4883	5.5193	6.2862	7.0531	7.4931
1228	0.898715	2.4346	3.6739	4.4918	5.5235	6.2910	7.0585	7.4989
1229	0.899401	2.4365	3.6768	4.4952	5.5277	6.2958	7.0639	7.5046
1230	0.900083	2.4383	3.6795	4.4986	5.5319	6.3006	7.0693	7.5103
1231	0.900761	2.4402	3.6823	4.5020	5.5361	6.3053	7.0746	7.5159
1232	0.901435	2.4420	3.6851	4.5054	5.5402	6.3100	7.0799	7.5216
1233	0.902105	2.4438	3.6878	4.5087	5.5443	6.3147	7.0851	7.5272
1234	0.902772	2.4456	3.6905	4.5121	5.5484	6.3194	7.0904	7.5327
1235	0.903434	2.4474	3.6932	4.5154	5.5525	6.3240	7.0956	7.5383
1240	0.906691	2.4562	3.7066	4.5316	5.5725	6.3468	7.1212	7.5654
1245	0.909862	2.4648	3.7195	4.5475	5.5920	6.3690	7.1461	7.5919
1250	0.912954	2.4732	3.7322	4.5629	5.6110	6.3907	7.1703	7.6177
1255	0.915973	2.4814	3.7445	4.5780	5.6296	6.4118	7.1941	7.6429
1260	0.918923	2.4894	3.7566	4.5928	5.6477	6.4325	7.2172	7.6675
1265	0.92181	2.4972	3.7684	4.6072	5.6654	6.4527	7.2399	7.6916
1270	0.924638	2.5048	3.7799	4.6213	5.6828	6.4725	7.2621	7.7152
1275	0.927409	2.5124	3.7912	4.6352	5.6999	6.4919	7.2839	7.7383
1280	0.930129	2.5197	3.8024	4.6488	5.7166	6.5109	7.3052	7.7610
1285	0.932799	2.5270	3.8133	4.6621	5.7330	6.5296	7.3262	7.7833
1290	0.935422	2.5341	3.8240	4.6752	5.7491	6.5480	7.3468	7.8052
1295	0.938	2.5410	3.8345	4.6881	5.7649	6.5660	7.3671	7.8267
1300	0.940537	2.5479	3.8449	4.7008	5.7805	6.5838	7.3870	7.8478
1305	0.943034	2.5547	3.8551	4.7133	5.7959	6.6012	7.4066	7.8687
1310	0.945492	2.5613	3.8652	4.7256	5.8110	6.6184	7.4259	7.8892
1315	0.947915	2.5679	3.8751	4.7377	5.8259	6.6354	7.4449	7.9094
1320	0.950302	2.5744	3.8848	4.7496	5.8406	6.6521	7.4637	7.9293
1325	0.952657	2.5807	3.8945	4.7614	5.8550	6.6686	7.4822	7.9490
1330	0.95498	2.5870	3.9040	4.7730	5.8693	6.6849	7.5004	7.9684
1335	0.957272	2.5932	3.9133	4.7844	5.8834	6.7009	7.5184	7.9875
1340	0.959535	2.5994	3.9226	4.7958	5.8973	6.7167	7.5362	8.0064
1345	0.96177	2.6054	3.9317	4.8069	5.9110	6.7324	7.5537	8.0250
1350	0.963978	2.6114	3.9407	4.8180	5.9246	6.7478	7.5711	8.0434
1355	0.966159	2.6173	3.9497	4.8289	5.9380	6.7631	7.5882	8.0616
1360	0.968316	2.6232	3.9585	4.8396	5.9513	6.7782	7.6052	8.0796
1365	0.970448	2.6289	3.9672	4.8503	5.9644	6.7931	7.6219	8.0974
1370	0.972558	2.6347	3.9758	4.8608	5.9773	6.8079	7.6385	8.1150
1375	0.974644	2.6403	3.9843	4.8713	5.9902	6.8225	7.6549	8.1324
1380	0.976709	2.6459	3.9928	4.8816	6.0029	6.8370	7.6711	8.1497
1385	0.978752	2.6514	4.0011	4.8918	6.0154	6.8513	7.6871	8.1667
1390	0.980775	2.6569	4.0094	4.9019	6.0278	6.8654	7.7030	8.1836
1395	0.982778	2.6623	4.0176	4.9119	6.0402	6.8794	7.7187	8.2003
1400	0.984761	2.6677	4.0257	4.9218	6.0523	6.8933	7.7343	8.2168
1405	0.986726	2.6730	4.0337	4.9317	6.0644	6.9071	7.7497	8.2332
1410	0.988673	2.6783	4.0417	4.9414	6.0764	6.9207	7.7650	8.2495
1415	0.990602	2.6835	4.0496	4.9510	6.0882	6.9342	7.7802	8.2656

Antelope Valley Line Capacity and Service Improvements Program
Canyon Siding Extension
Rainfall Data

Waterth Inc.
Project #21-019.0

1420	0.992514	2.6887	4.0574	4.9606	6.1000	6.9476	7.7952	8.2815
1425	0.99441	2.6939	4.0651	4.9701	6.1116	6.9609	7.8101	8.2974
1430	0.996289	2.6989	4.0728	4.9795	6.1232	6.9740	7.8249	8.3130
1435	0.998152	2.7040	4.0804	4.9888	6.1346	6.9871	7.8395	8.3286
1440	1	2.7090	4.0880	4.9980	6.1460	7.0000	7.8540	8.3440

Antelope Valley Line Capacity and Service Improvements Program
 Lancaster Terminal Improvements
 Rainfall Data

Waterth Inc.
 Project #21-019.0

Frequency	Multiplication Factor
2-Year	0.387
5-Year	0.584
10-Year	0.714
25-Year	0.878
50-Year	1
100-Year	1.122
200-Year	1.192

Frequency	Isohyetal Depth (in)
2-Year	1.08
5-Year	1.64
10-Year	2.00
25-Year	2.46
50-Year	2.80
100-Year	3.14
200-Year	3.34

50yr Two Tenths (Rainfall)	2.8 in
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<https://dgpw.lacounty.gov/wrd/hydrologygis/>

Project Site: Lancaster Terminal Improvements
 Address: 44812 Sierra Hwy, Lancaster, CA 93534

Time	Depth	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	200-Year
Minutes	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
0	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.011111	0.0120	0.0182	0.0222	0.0273	0.0311	0.0349	0.0371
60	0.022361	0.0242	0.0366	0.0447	0.0550	0.0626	0.0702	0.0746
90	0.033758	0.0366	0.0552	0.0675	0.0830	0.0945	0.1061	0.1127
120	0.045307	0.0491	0.0741	0.0906	0.1114	0.1269	0.1423	0.1512
150	0.057015	0.0618	0.0932	0.1140	0.1402	0.1596	0.1791	0.1903
180	0.068889	0.0746	0.1126	0.1377	0.1694	0.1929	0.2164	0.2299
210	0.080937	0.0877	0.1323	0.1618	0.1990	0.2266	0.2543	0.2701
240	0.093166	0.1010	0.1523	0.1863	0.2290	0.2609	0.2927	0.3110
270	0.105586	0.1144	0.1727	0.2111	0.2596	0.2956	0.3317	0.3524
300	0.118206	0.1281	0.1933	0.2363	0.2906	0.3310	0.3714	0.3945
330	0.131037	0.1420	0.2143	0.2620	0.3221	0.3669	0.4117	0.4373
360	0.14409	0.1561	0.2356	0.2881	0.3542	0.4035	0.4527	0.4809
390	0.157377	0.1705	0.2573	0.3146	0.3869	0.4407	0.4944	0.5253
420	0.170913	0.1852	0.2795	0.3417	0.4202	0.4786	0.5369	0.5704
450	0.184711	0.2002	0.3020	0.3693	0.4541	0.5172	0.5803	0.6165
480	0.19879	0.2154	0.3251	0.3974	0.4887	0.5566	0.6245	0.6635
510	0.213168	0.2312	0.3488	0.4265	0.5244	0.5973	0.6702	0.7120
540	0.227865	0.2469	0.3726	0.4555	0.5602	0.6380	0.7159	0.7605
570	0.242905	0.2632	0.3972	0.4856	0.5972	0.6801	0.7631	0.8107
600	0.258314	0.2799	0.4224	0.5164	0.6350	0.7233	0.8115	0.8621
630	0.274121	0.2970	0.4482	0.5480	0.6739	0.7675	0.8612	0.9149
660	0.290362	0.3146	0.4748	0.5805	0.7138	0.8130	0.9122	0.9691
690	0.307075	0.3327	0.5021	0.6139	0.7549	0.8598	0.9647	1.0249
720	0.323307	0.3503	0.5287	0.6464	0.7948	0.9053	1.0157	1.0791
750	0.342111	0.3707	0.5594	0.6839	0.8410	0.9579	1.0748	1.1418
780	0.360552	0.3907	0.5896	0.7208	0.8864	1.0095	1.1327	1.2034
810	0.379705	0.4114	0.6209	0.7591	0.9335	1.0632	1.1929	1.2673
840	0.399666	0.4331	0.6535	0.7990	0.9825	1.1191	1.2556	1.3339
870	0.420552	0.4557	0.6877	0.8408	1.0339	1.1775	1.3212	1.4036
900	0.442511	0.4795	0.7236	0.8847	1.0879	1.2390	1.3902	1.4769
930	0.465738	0.5047	0.7616	0.9311	1.1450	1.3041	1.4632	1.5544
960	0.490493	0.5315	0.8021	0.9806	1.2058	1.3734	1.5409	1.6371
970	0.499144	0.5409	0.8162	0.9979	1.2271	1.3976	1.5681	1.6659
980	0.508022	0.5505	0.8307	1.0156	1.2489	1.4225	1.5960	1.6956
990	0.517145	0.5604	0.8456	1.0339	1.2713	1.4480	1.6247	1.7260
1000	0.526538	0.5706	0.8610	1.0527	1.2944	1.4743	1.6542	1.7574
1010	0.536225	0.5811	0.8768	1.0720	1.3183	1.5014	1.6846	1.7897
1020	0.5462399	0.5919	0.8932	1.0920	1.3429	1.5295	1.7161	1.8231
1030	0.556617	0.6032	0.9102	1.1128	1.3684	1.5585	1.7487	1.8578
1040	0.567402	0.6148	0.9278	1.1344	1.3949	1.5887	1.7826	1.8938
1050	0.578651	0.6270	0.9462	1.1568	1.4226	1.6202	1.8179	1.9313
1060	0.590431	0.6398	0.9655	1.1804	1.4515	1.6532	1.8549	1.9706
1070	0.60283	0.6532	0.9857	1.2052	1.4820	1.6879	1.8939	2.0120
1080	0.615962	0.6675	1.0072	1.2314	1.5143	1.7247	1.9351	2.0558
1090	0.629985	0.6827	1.0302	1.2595	1.5488	1.7640	1.9792	2.1026
1100	0.645118	0.6990	1.0549	1.2897	1.5860	1.8063	2.0267	2.1531
1110	0.661694	0.7170	1.0820	1.3229	1.6267	1.8527	2.0788	2.2085
1115	0.67068	0.7267	1.0967	1.3408	1.6488	1.8779	2.1070	2.2385
1120	0.680257	0.7371	1.1124	1.3600	1.6723	1.9047	2.1371	2.2704
1125	0.690568	0.7483	1.1292	1.3806	1.6977	1.9336	2.1695	2.3048
1130	0.701824	0.7605	1.1476	1.4031	1.7254	1.9651	2.2049	2.3424
1135	0.714364	0.7741	1.1681	1.4282	1.7562	2.0002	2.2442	2.3843
1136	0.717072	0.7770	1.1726	1.4336	1.7628	2.0078	2.2528	2.3933
1137	0.71986	0.7800	1.1771	1.4391	1.7697	2.0156	2.2615	2.4026
1138	0.722738	0.7832	1.1818	1.4449	1.7768	2.0237	2.2706	2.4122
1139	0.725713	0.7864	1.1867	1.4508	1.7841	2.0320	2.2799	2.4221
1140	0.728799	0.7897	1.1917	1.4570	1.7917	2.0406	2.2896	2.4324
1145	0.746492	0.8089	1.2207	1.4924	1.8352	2.0902	2.3452	2.4915
1150	0.772454	0.8370	1.2631	1.5443	1.8990	2.1629	2.4267	2.5781
1151	0.780923	0.8462	1.2770	1.5612	1.9198	2.1866	2.4533	2.6064
1152	0.8	0.8669	1.3082	1.5994	1.9667	2.2400	2.5133	2.6701
1153	0.809944	0.8777	1.3244	1.6192	1.9912	2.2678	2.5445	2.7033
1154	0.814358	0.8824	1.3316	1.6281	2.0020	2.2802	2.5584	2.7180
1155	0.8178	0.8862	1.3373	1.6349	2.0105	2.2898	2.5692	2.7295
1156	0.820732	0.8893	1.3421	1.6408	2.0177	2.2980	2.5784	2.7393
1157	0.823335	0.8922	1.3463	1.6460	2.0241	2.3053	2.5866	2.7480
1158	0.825702	0.8947	1.3502	1.6507	2.0299	2.3120	2.5940	2.7559
1159	0.82789	0.8971	1.3538	1.6551	2.0353	2.3181	2.6009	2.7632
1160	0.829936	0.8993	1.3571	1.6592	2.0403	2.3238	2.6073	2.7700
1161	0.831864	0.9014	1.3603	1.6631	2.0451	2.3292	2.6134	2.7764
1162	0.833694	0.9034	1.3633	1.6667	2.0496	2.3343	2.6191	2.7825
1163	0.83544	0.9053	1.3661	1.6702	2.0538	2.3392	2.6246	2.7884
1164	0.837112	0.9071	1.3688	1.6736	2.0580	2.3439	2.6299	2.7939
1165	0.838721	0.9088	1.3715	1.6768	2.0619	2.3484	2.6349	2.7993

1166	0.840272	0.9105	1.3740	1.6799	2.0657	2.3528	2.6398	2.8045
1167	0.841772	0.9121	1.3765	1.6829	2.0694	2.3570	2.6445	2.8095
1168	0.843225	0.9137	1.3788	1.6858	2.0730	2.3610	2.6491	2.8143
1169	0.844636	0.9152	1.3811	1.6886	2.0765	2.3650	2.6535	2.8191
1170	0.846009	0.9167	1.3834	1.6913	2.0798	2.3688	2.6578	2.8236
1171	0.847347	0.9182	1.3856	1.6940	2.0831	2.3726	2.6620	2.8281
1172	0.848652	0.9196	1.3877	1.6966	2.0863	2.3762	2.6661	2.8325
1173	0.849926	0.9210	1.3898	1.6992	2.0895	2.3798	2.6701	2.8367
1174	0.851172	0.9223	1.3918	1.7017	2.0925	2.3833	2.6740	2.8409
1175	0.852392	0.9237	1.3938	1.7041	2.0955	2.3867	2.6779	2.8449
1176	0.853588	0.9249	1.3958	1.7065	2.0985	2.3900	2.6816	2.8489
1177	0.85476	0.9262	1.3977	1.7088	2.1013	2.3933	2.6853	2.8528
1178	0.85591	0.9275	1.3996	1.7111	2.1042	2.3965	2.6889	2.8567
1179	0.857039	0.9287	1.4014	1.7134	2.1069	2.3997	2.6925	2.8605
1180	0.858149	0.9299	1.4032	1.7156	2.1097	2.4028	2.6960	2.8642
1181	0.859241	0.9311	1.4050	1.7178	2.1124	2.4059	2.6994	2.8678
1182	0.860315	0.9322	1.4068	1.7199	2.1150	2.4089	2.7028	2.8714
1183	0.861372	0.9334	1.4085	1.7221	2.1176	2.4118	2.7061	2.8749
1184	0.862414	0.9345	1.4102	1.7241	2.1202	2.4148	2.7094	2.8784
1185	0.86344	0.9356	1.4119	1.7262	2.1227	2.4176	2.7126	2.8818
1186	0.864452	0.9367	1.4136	1.7282	2.1252	2.4205	2.7158	2.8852
1187	0.86545	0.9378	1.4152	1.7302	2.1276	2.4233	2.7189	2.8885
1188	0.866434	0.9389	1.4168	1.7322	2.1300	2.4260	2.7220	2.8918
1189	0.867406	0.9399	1.4184	1.7341	2.1324	2.4287	2.7250	2.8951
1190	0.868366	0.9410	1.4200	1.7360	2.1348	2.4314	2.7281	2.8983
1191	0.869313	0.9420	1.4215	1.7379	2.1371	2.4341	2.7310	2.9014
1192	0.87025	0.9430	1.4230	1.7398	2.1394	2.4367	2.7340	2.9045
1193	0.871175	0.9440	1.4245	1.7417	2.1417	2.4393	2.7369	2.9076
1194	0.87209	0.9450	1.4260	1.7435	2.1439	2.4419	2.7398	2.9107
1195	0.872995	0.9460	1.4275	1.7453	2.1462	2.4444	2.7426	2.9137
1196	0.873889	0.9469	1.4290	1.7471	2.1484	2.4469	2.7454	2.9167
1197	0.874775	0.9479	1.4304	1.7489	2.1505	2.4494	2.7482	2.9196
1198	0.875651	0.9489	1.4319	1.7506	2.1527	2.4518	2.7509	2.9226
1199	0.876518	0.9498	1.4333	1.7523	2.1548	2.4543	2.7537	2.9255
1200	0.877377	0.9507	1.4347	1.7541	2.1569	2.4567	2.7564	2.9283
1201	0.879227	0.9527	1.4377	1.7578	2.1615	2.4618	2.7622	2.9345
1202	0.879069	0.9526	1.4375	1.7574	2.1611	2.4614	2.7617	2.9340
1203	0.879903	0.9535	1.4388	1.7591	2.1632	2.4637	2.7643	2.9368
1204	0.88073	0.9544	1.4402	1.7608	2.1652	2.4660	2.7669	2.9395
1205	0.881549	0.9552	1.4415	1.7624	2.1672	2.4683	2.7695	2.9423
1206	0.882361	0.9561	1.4428	1.7640	2.1692	2.4706	2.7720	2.9450
1207	0.883166	0.9570	1.4442	1.7656	2.1712	2.4729	2.7746	2.9477
1208	0.883964	0.9579	1.4455	1.7672	2.1731	2.4751	2.7771	2.9503
1209	0.884755	0.9587	1.4468	1.7688	2.1751	2.4773	2.7795	2.9530
1210	0.88554	0.9596	1.4480	1.7704	2.1770	2.4795	2.7820	2.9556
1211	0.886318	0.9604	1.4493	1.7719	2.1789	2.4817	2.7845	2.9582
1212	0.887091	0.9613	1.4506	1.7735	2.1808	2.4839	2.7869	2.9608
1213	0.887857	0.9621	1.4518	1.7750	2.1827	2.4860	2.7893	2.9633
1214	0.888618	0.9629	1.4531	1.7765	2.1846	2.4881	2.7917	2.9659
1215	0.889372	0.9637	1.4543	1.7780	2.1864	2.4902	2.7941	2.9684
1216	0.890121	0.9645	1.4555	1.7795	2.1883	2.4923	2.7964	2.9709
1217	0.890865	0.9653	1.4567	1.7810	2.1901	2.4944	2.7987	2.9734
1218	0.891603	0.9661	1.4579	1.7825	2.1919	2.4965	2.8011	2.9758
1219	0.892336	0.9669	1.4591	1.7840	2.1937	2.4985	2.8034	2.9783
1220	0.893064	0.9677	1.4603	1.7854	2.1955	2.5006	2.8056	2.9807
1221	0.893787	0.9685	1.4615	1.7869	2.1973	2.5026	2.8079	2.9831
1222	0.894505	0.9693	1.4627	1.7883	2.1991	2.5046	2.8102	2.9855
1223	0.895218	0.9701	1.4639	1.7897	2.2008	2.5066	2.8124	2.9879
1224	0.895926	0.9708	1.4650	1.7911	2.2025	2.5086	2.8146	2.9902
1225	0.89663	0.9716	1.4662	1.7925	2.2043	2.5106	2.8169	2.9926
1226	0.89733	0.9723	1.4673	1.7939	2.2060	2.5125	2.8191	2.9949
1227	0.898024	0.9731	1.4684	1.7953	2.2077	2.5145	2.8212	2.9972
1228	0.898715	0.9738	1.4696	1.7967	2.2094	2.5164	2.8234	2.9996
1229	0.899401	0.9746	1.4707	1.7981	2.2111	2.5183	2.8256	3.0018
1230	0.900083	0.9753	1.4718	1.7994	2.2128	2.5202	2.8277	3.0041
1231	0.900761	0.9761	1.4729	1.8008	2.2144	2.5221	2.8298	3.0064
1232	0.901435	0.9768	1.4740	1.8021	2.2161	2.5240	2.8319	3.0086
1233	0.902105	0.9775	1.4751	1.8035	2.2177	2.5259	2.8341	3.0109
1234	0.902772	0.9782	1.4762	1.8048	2.2194	2.5278	2.8361	3.0131
1235	0.903434	0.9790	1.4773	1.8061	2.2210	2.5296	2.8382	3.0153
1240	0.906691	0.9825	1.4826	1.8127	2.2290	2.5387	2.8485	3.0262
1245	0.909862	0.9859	1.4878	1.8190	2.2368	2.5476	2.8584	3.0368
1250	0.912954	0.9893	1.4929	1.8252	2.2444	2.5563	2.8681	3.0471
1255	0.915973	0.9925	1.4978	1.8312	2.2518	2.5647	2.8776	3.0572
1260	0.918923	0.9957	1.5026	1.8371	2.2591	2.5730	2.8869	3.0670
1265	0.92181	0.9989	1.5073	1.8429	2.2662	2.5811	2.8960	3.0766
1270	0.924638	1.0019	1.5120	1.8485	2.2731	2.5890	2.9048	3.0861
1275	0.927409	1.0049	1.5165	1.8541	2.2799	2.5967	2.9135	3.0953
1280	0.930129	1.0079	1.5209	1.8595	2.2866	2.6044	2.9221	3.1044
1285	0.932799	1.0108	1.5253	1.8649	2.2932	2.6118	2.9305	3.1133
1290	0.935422	1.0136	1.5296	1.8701	2.2996	2.6192	2.9387	3.1221
1295	0.938	1.0164	1.5338	1.8752	2.3060	2.6264	2.9468	3.1307
1300	0.940537	1.0192	1.5380	1.8803	2.3122	2.6335	2.9548	3.1391
1305	0.943034	1.0219	1.5420	1.8853	2.3184	2.6405	2.9626	3.1475
1310	0.945492	1.0245	1.5461	1.8902	2.3244	2.6474	2.9704	3.1557
1315	0.947915	1.0272	1.5500	1.8951	2.3304	2.6542	2.9780	3.1638
1320	0.950302	1.0297	1.5539	1.8998	2.3362	2.6608	2.9855	3.1717
1325	0.952657	1.0323	1.5578	1.9046	2.3420	2.6674	2.9929	3.1796
1330	0.95498	1.0348	1.5616	1.9092	2.3477	2.6739	3.0002	3.1873
1335	0.957272	1.0373	1.5653	1.9138	2.3534	2.6804	3.0074	3.1950

Antelope Valley Line Capacity and Service Improvements Program
 Lancaster Terminal Improvements
 Rainfall Data

Waterth Inc.
 Project #21-019.0

1340	0.959535	1.0398	1.5690	1.9183	2.3589	2.6867	3.0145	3.2025
1345	0.96177	1.0422	1.5727	1.9228	2.3644	2.6930	3.0215	3.2100
1350	0.963978	1.0446	1.5763	1.9272	2.3698	2.6991	3.0284	3.2174
1355	0.966159	1.0469	1.5799	1.9315	2.3752	2.7052	3.0353	3.2247
1360	0.968316	1.0493	1.5834	1.9359	2.3805	2.7113	3.0421	3.2319
1365	0.970448	1.0516	1.5869	1.9401	2.3857	2.7173	3.0488	3.2390
1370	0.972558	1.0539	1.5903	1.9443	2.3909	2.7232	3.0554	3.2460
1375	0.974644	1.0561	1.5937	1.9485	2.3961	2.7290	3.0619	3.2530
1380	0.976709	1.0584	1.5971	1.9526	2.4011	2.7348	3.0684	3.2599
1385	0.978752	1.0606	1.6005	1.9567	2.4062	2.7405	3.0748	3.2667
1390	0.980775	1.0628	1.6038	1.9608	2.4111	2.7462	3.0812	3.2734
1395	0.982778	1.0649	1.6070	1.9648	2.4161	2.7518	3.0875	3.2801
1400	0.984761	1.0671	1.6103	1.9687	2.4209	2.7573	3.0937	3.2867
1405	0.986726	1.0692	1.6135	1.9727	2.4258	2.7628	3.0999	3.2933
1410	0.988673	1.0713	1.6167	1.9766	2.4306	2.7683	3.1060	3.2998
1415	0.990602	1.0734	1.6198	1.9804	2.4353	2.7737	3.1121	3.3062
1420	0.992514	1.0755	1.6230	1.9842	2.4400	2.7790	3.1181	3.3126
1425	0.99441	1.0775	1.6261	1.9880	2.4447	2.7843	3.1240	3.3189
1430	0.996289	1.0796	1.6291	1.9918	2.4493	2.7896	3.1299	3.3252
1435	0.998152	1.0816	1.6322	1.9955	2.4539	2.7948	3.1358	3.3314
1440	1	1.0836	1.6352	1.9992	2.4584	2.8000	3.1416	3.3376



Water Resources and Hydrology Technical Memo

Antelope Valley Line

Appendix B

MODRAT Input and Output Data

Peak Flow Hydrologic Analysis

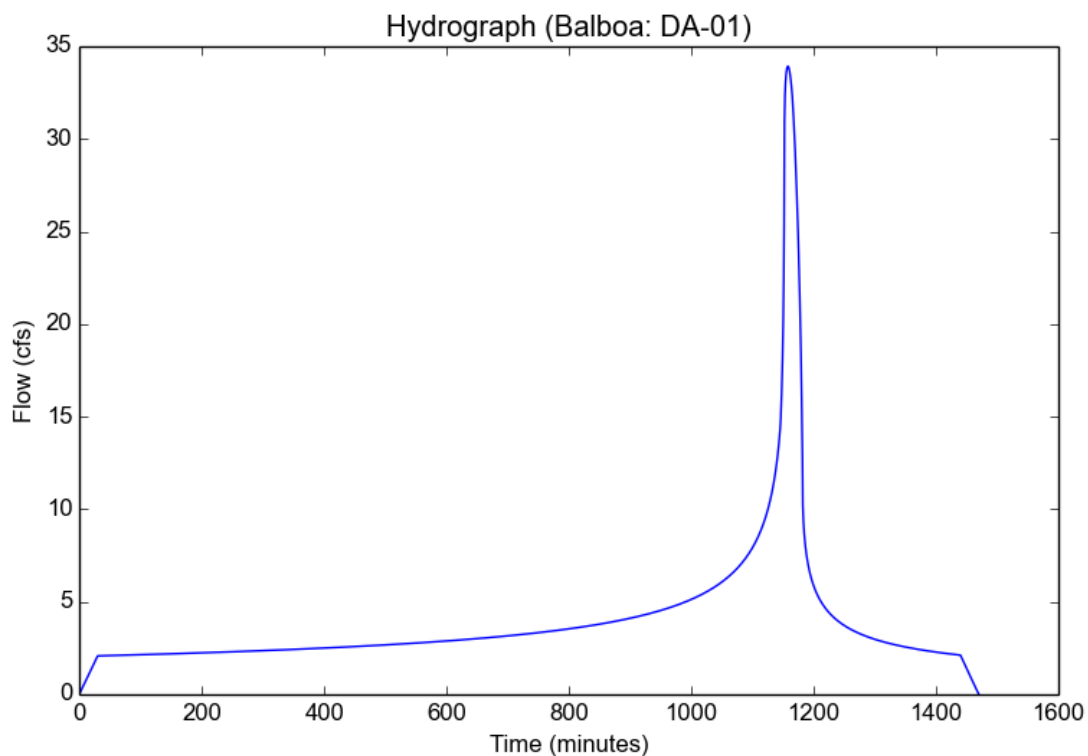
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Existing Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.321
Soil Type	63
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.3155
Developed Runoff Coefficient (Cd)	0.5032
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	33.9273
Burned Peak Flow Rate (cfs)	33.9273
24-Hr Clear Runoff Volume (ac-ft)	8.0412
24-Hr Clear Runoff Volume (cu-ft)	350272.8494



Peak Flow Hydrologic Analysis

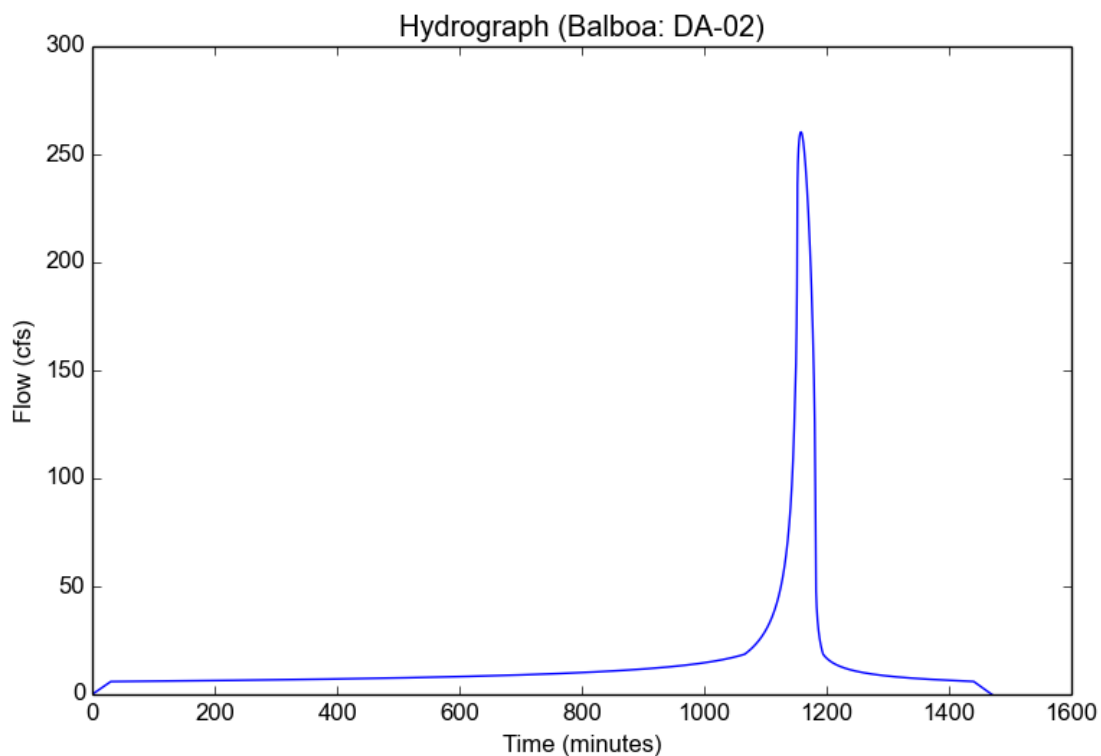
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Existing Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.4882
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	260.3759
Burned Peak Flow Rate (cfs)	260.3759
24-Hr Clear Runoff Volume (ac-ft)	31.2495
24-Hr Clear Runoff Volume (cu-ft)	1361226.9276



Peak Flow Hydrologic Analysis

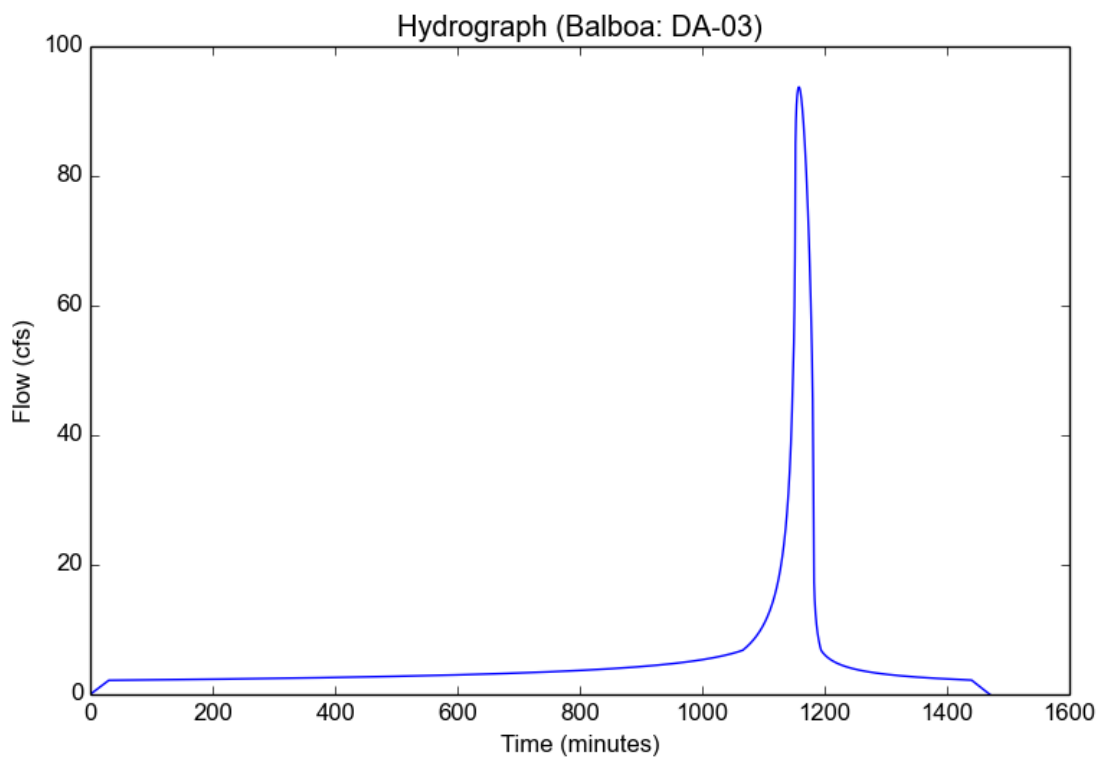
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Existing Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.039
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.4895
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	93.7265
Burned Peak Flow Rate (cfs)	93.7265
24-Hr Clear Runoff Volume (ac-ft)	11.3568
24-Hr Clear Runoff Volume (cu-ft)	494703.512



Peak Flow Hydrologic Analysis

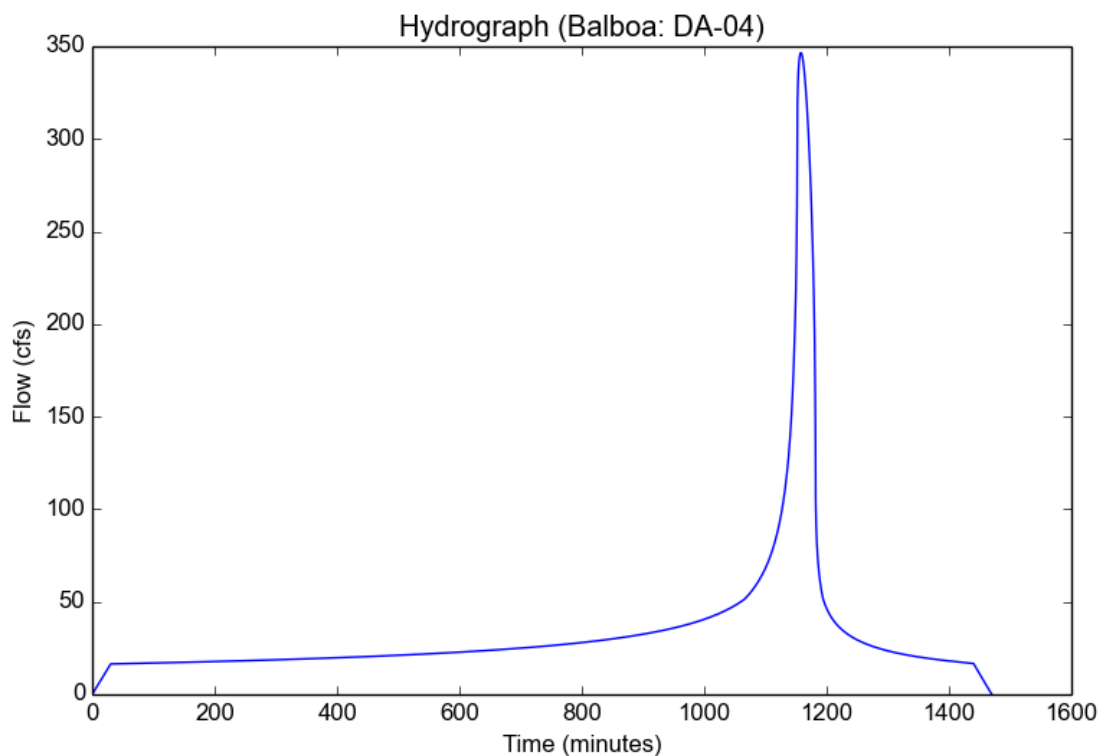
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.282
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.5933
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	346.5666
Burned Peak Flow Rate (cfs)	346.5666
24-Hr Clear Runoff Volume (ac-ft)	68.6313
24-Hr Clear Runoff Volume (cu-ft)	2989579.0461



Peak Flow Hydrologic Analysis

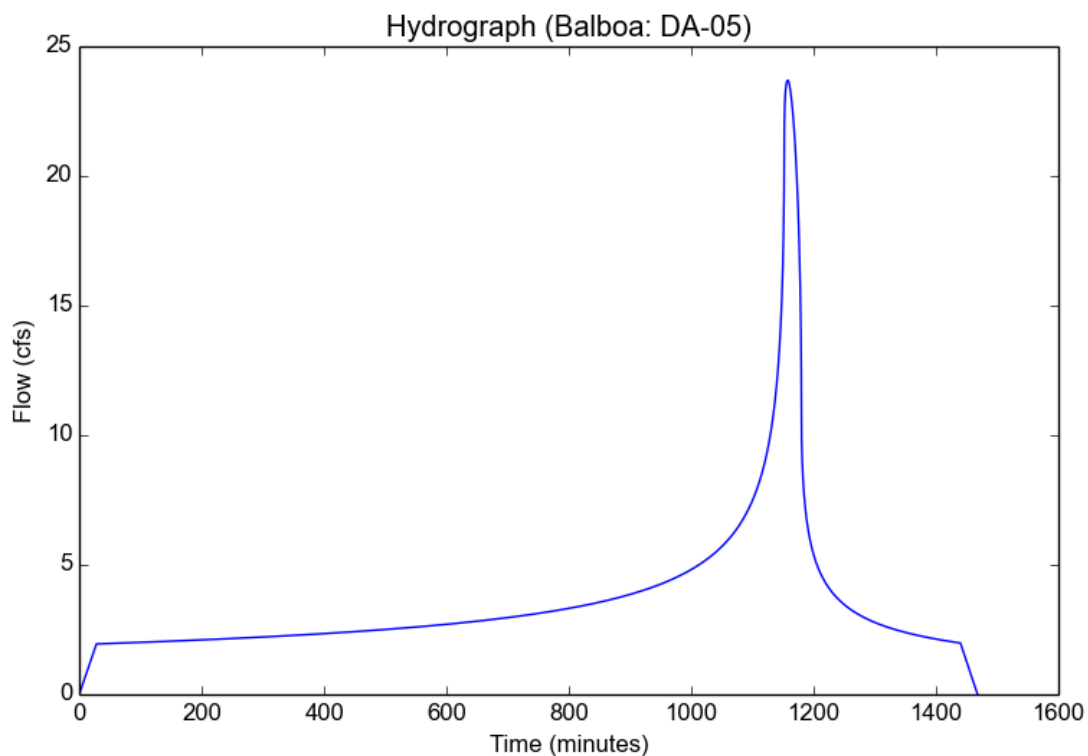
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.959
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.8014
Undeveloped Runoff Coefficient (Cu)	0.4835
Developed Runoff Coefficient (Cd)	0.8829
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	23.6902
Burned Peak Flow Rate (cfs)	23.6902
24-Hr Clear Runoff Volume (ac-ft)	7.2623
24-Hr Clear Runoff Volume (cu-ft)	316346.8541



Peak Flow Hydrologic Analysis

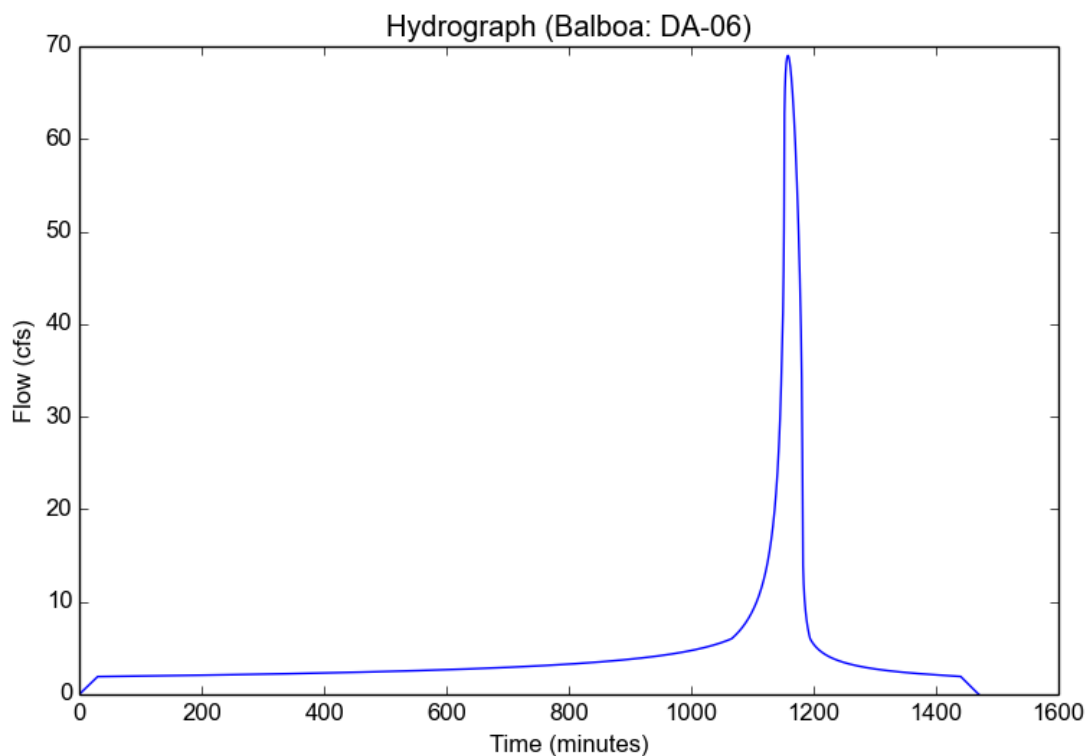
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Existing Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.079
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.5066
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	69.0111
Burned Peak Flow Rate (cfs)	69.0111
24-Hr Clear Runoff Volume (ac-ft)	9.3847
24-Hr Clear Runoff Volume (cu-ft)	408796.3779



Peak Flow Hydrologic Analysis

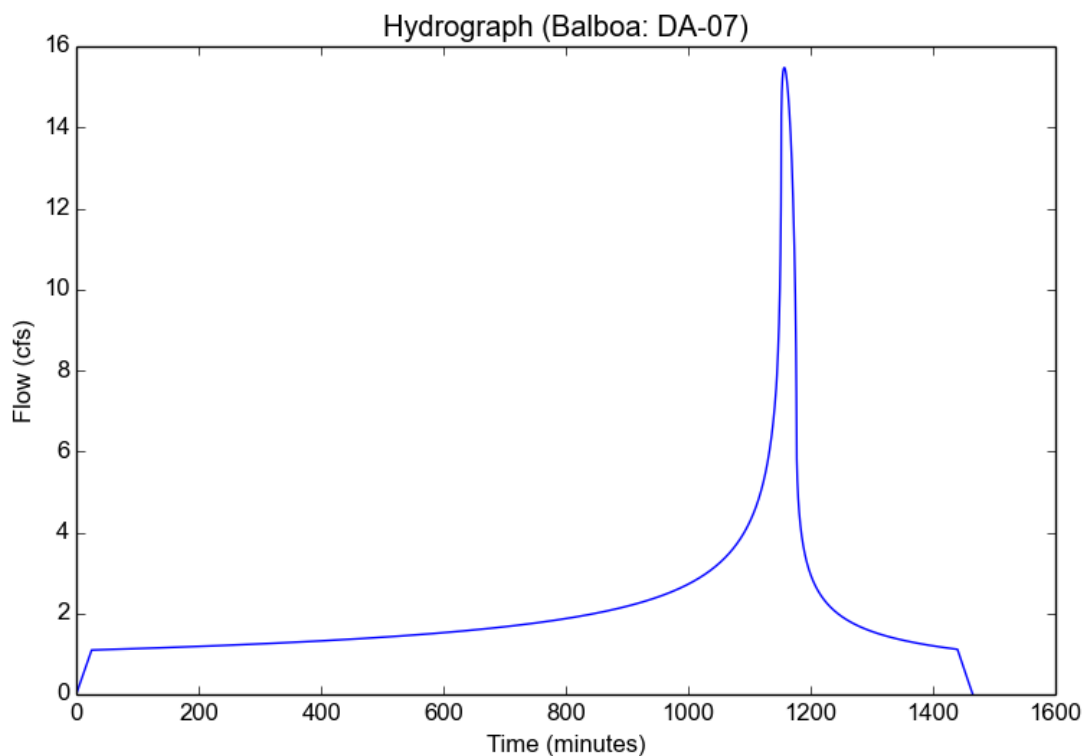
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Existing Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.68
Soil Type	63
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.8453
Undeveloped Runoff Coefficient (Cu)	0.342
Developed Runoff Coefficient (Cd)	0.7214
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	15.4766
Burned Peak Flow Rate (cfs)	15.4766
24-Hr Clear Runoff Volume (ac-ft)	4.1238
24-Hr Clear Runoff Volume (cu-ft)	179632.5681



Peak Flow Hydrologic Analysis

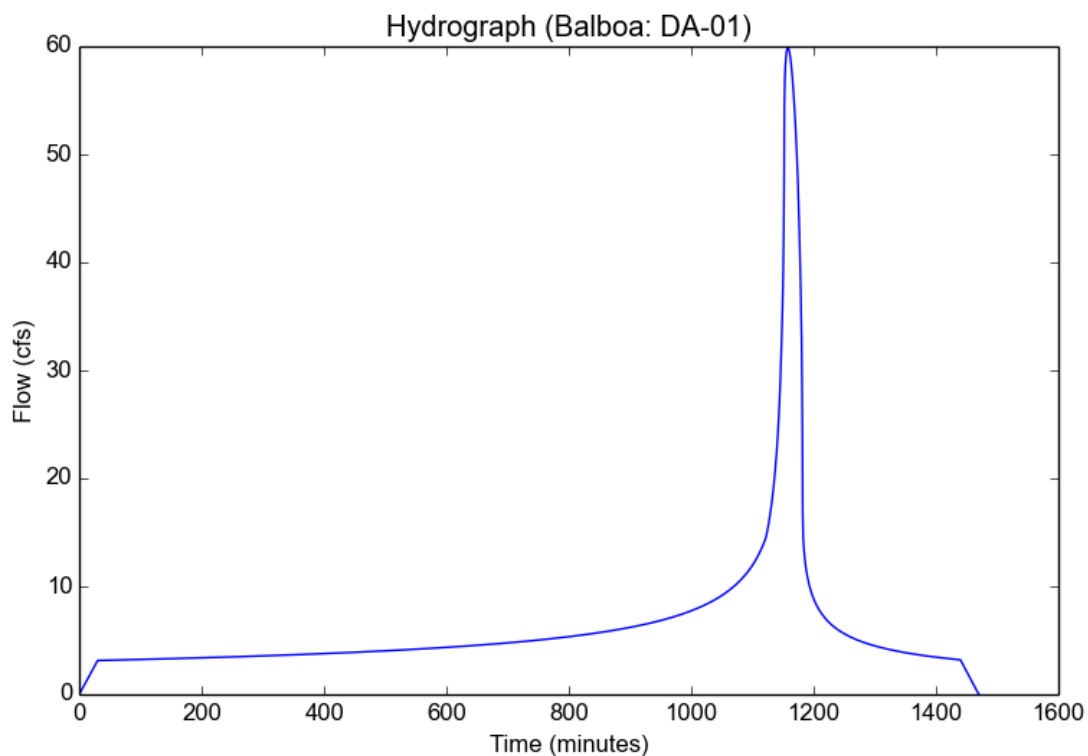
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.321
Soil Type	63
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.4412
Developed Runoff Coefficient (Cd)	0.5884
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	59.8765
Burned Peak Flow Rate (cfs)	59.8765
24-Hr Clear Runoff Volume (ac-ft)	12.6425
24-Hr Clear Runoff Volume (cu-ft)	550707.996



Peak Flow Hydrologic Analysis

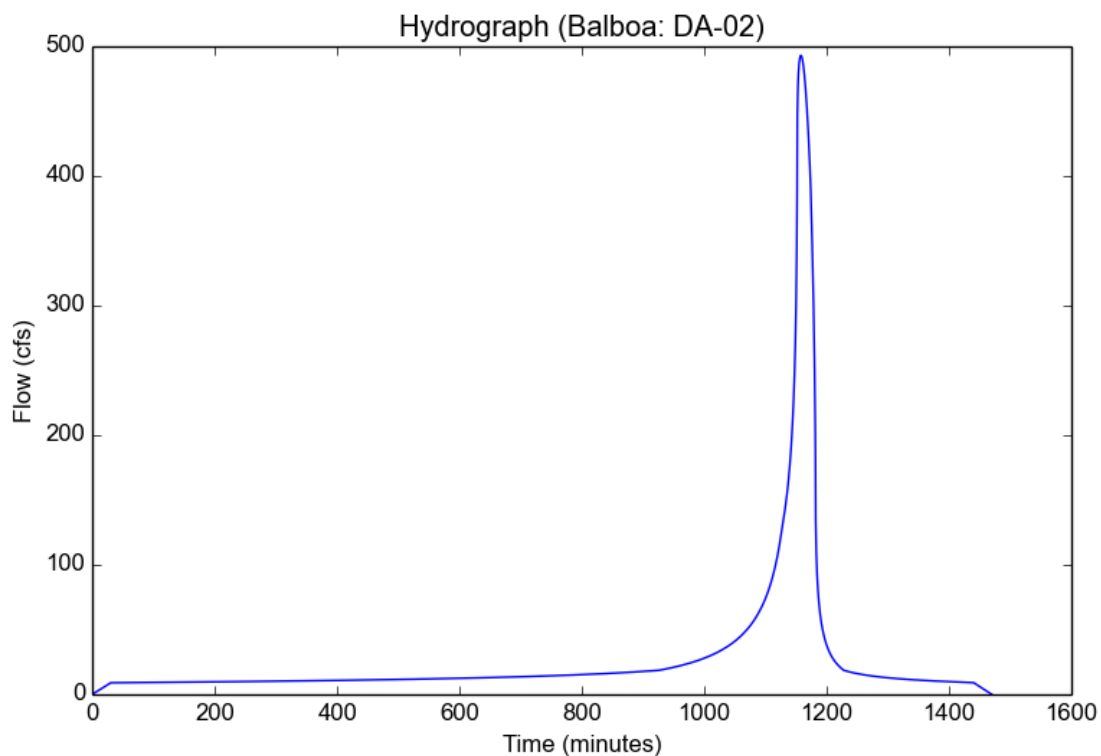
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Existing Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.6019
Developed Runoff Coefficient (Cd)	0.6126
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	493.0533
Burned Peak Flow Rate (cfs)	493.0533
24-Hr Clear Runoff Volume (ac-ft)	57.425
24-Hr Clear Runoff Volume (cu-ft)	2501434.2997



Peak Flow Hydrologic Analysis

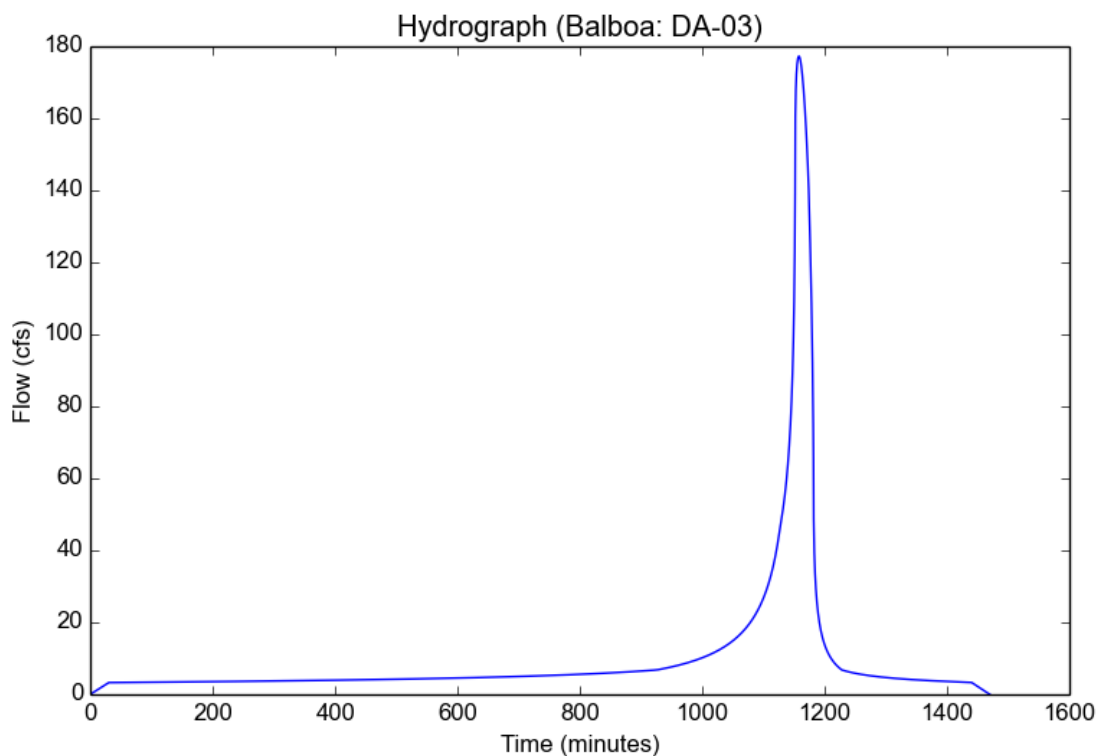
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.039
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.6019
Developed Runoff Coefficient (Cd)	0.6135
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	177.2762
Burned Peak Flow Rate (cfs)	177.2762
24-Hr Clear Runoff Volume (ac-ft)	20.813
24-Hr Clear Runoff Volume (cu-ft)	906614.7605



Peak Flow Hydrologic Analysis

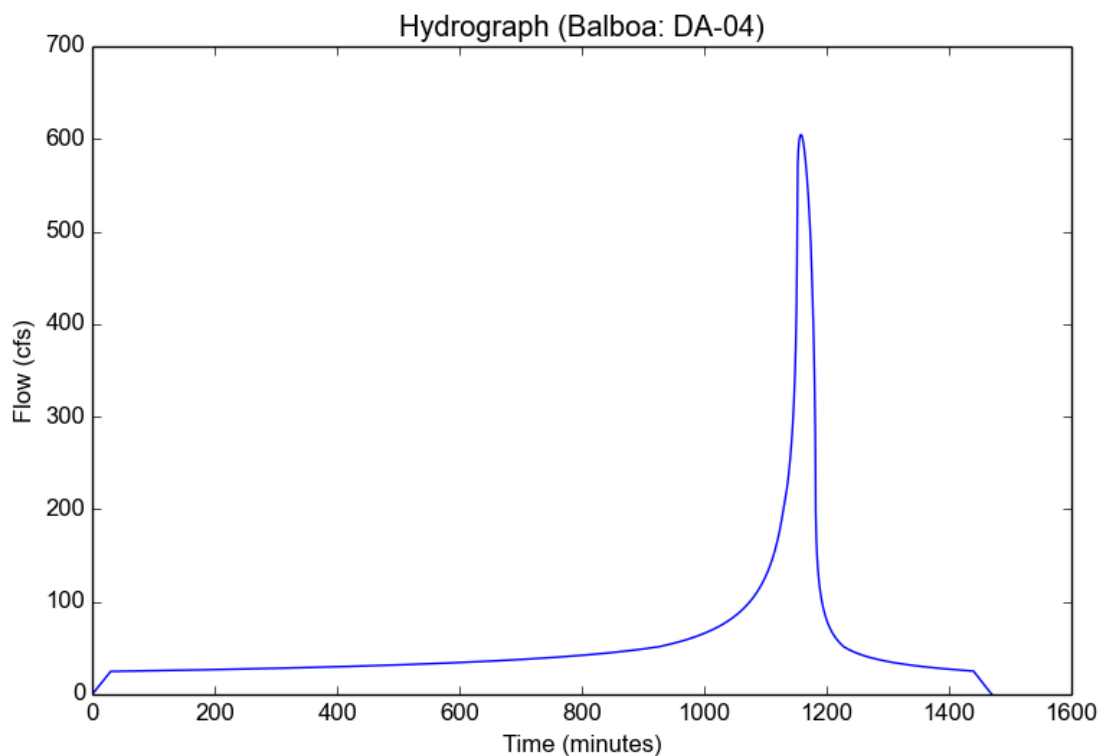
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Existing Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.282
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.6019
Developed Runoff Coefficient (Cd)	0.686
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	604.6711
Burned Peak Flow Rate (cfs)	604.6711
24-Hr Clear Runoff Volume (ac-ft)	111.9441
24-Hr Clear Runoff Volume (cu-ft)	4876286.7052



Peak Flow Hydrologic Analysis

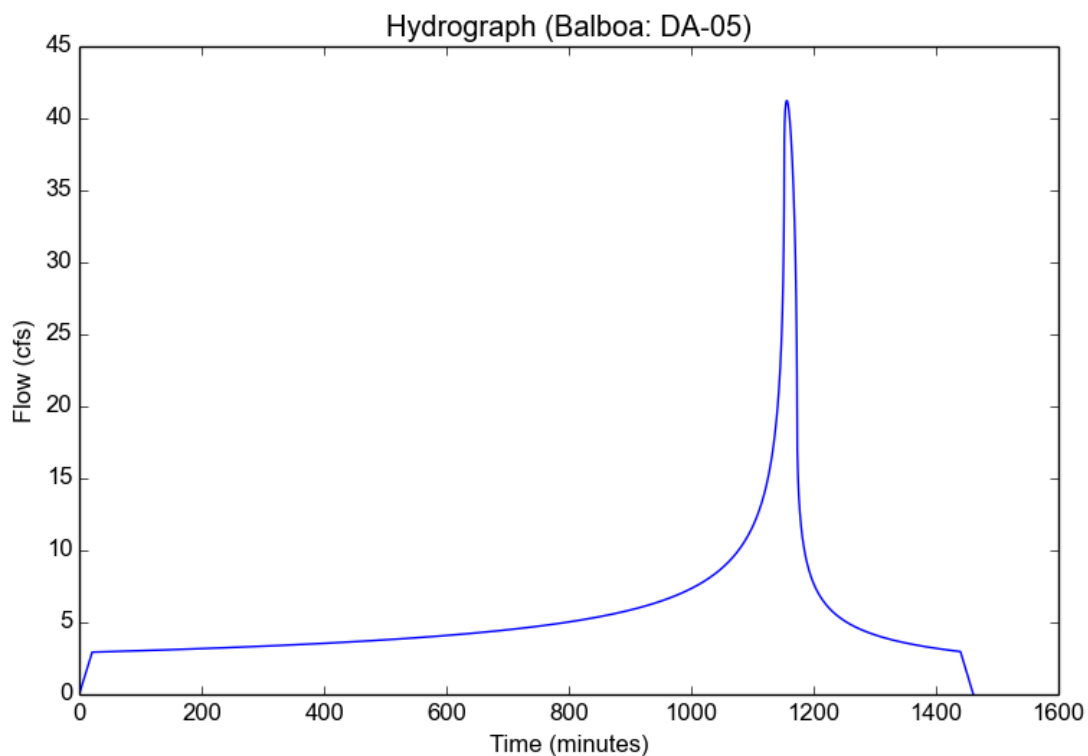
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.959
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.3845
Undeveloped Runoff Coefficient (Cu)	0.6467
Developed Runoff Coefficient (Cd)	0.8896
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	41.2354
Burned Peak Flow Rate (cfs)	41.2354
24-Hr Clear Runoff Volume (ac-ft)	10.981
24-Hr Clear Runoff Volume (cu-ft)	478331.41



Peak Flow Hydrologic Analysis

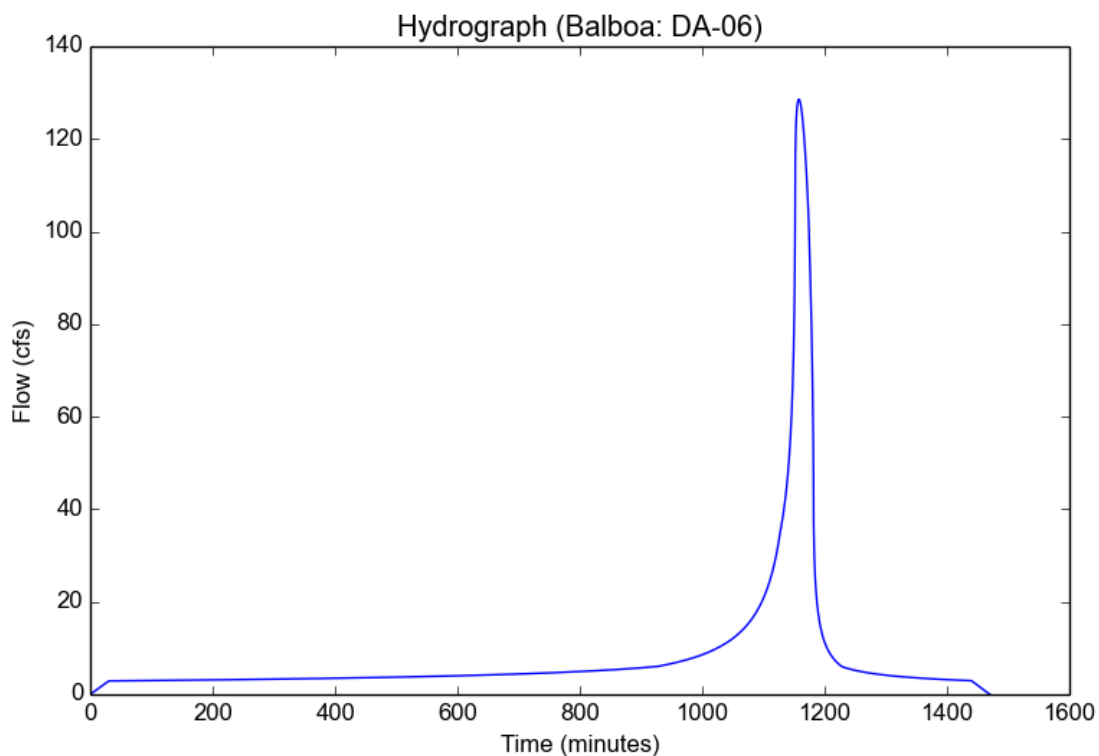
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.079
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.6019
Developed Runoff Coefficient (Cd)	0.6254
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	128.5775
Burned Peak Flow Rate (cfs)	128.5775
24-Hr Clear Runoff Volume (ac-ft)	16.6677
24-Hr Clear Runoff Volume (cu-ft)	726046.45



Peak Flow Hydrologic Analysis

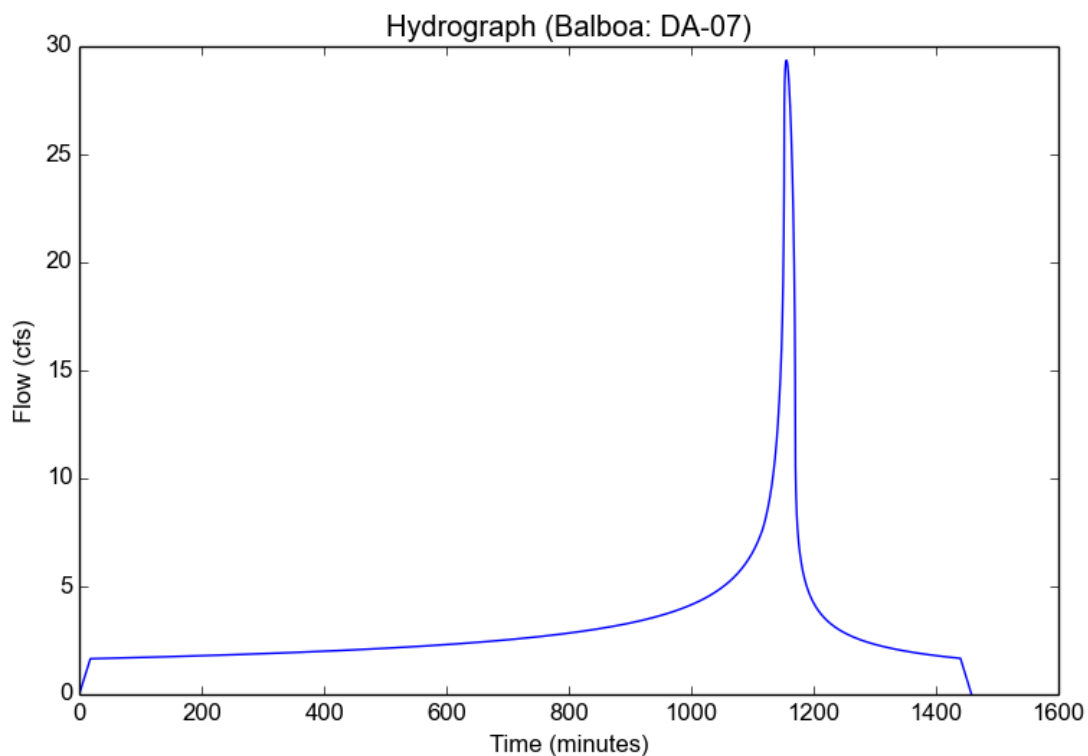
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.68
Soil Type	63
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.4885
Undeveloped Runoff Coefficient (Cu)	0.5162
Developed Runoff Coefficient (Cd)	0.7772
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	29.3606
Burned Peak Flow Rate (cfs)	29.3606
24-Hr Clear Runoff Volume (ac-ft)	6.2948
24-Hr Clear Runoff Volume (cu-ft)	274201.8138



Peak Flow Hydrologic Analysis

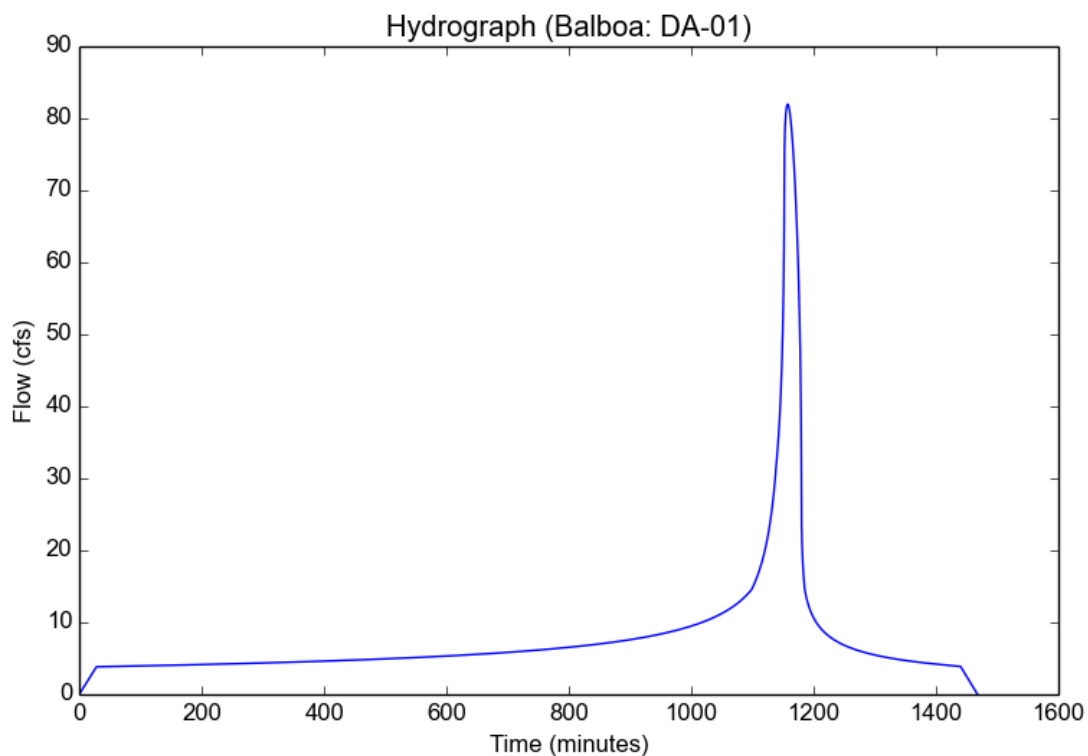
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.321
Soil Type	63
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4786
Undeveloped Runoff Coefficient (Cu)	0.5139
Developed Runoff Coefficient (Cd)	0.6378
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	81.9619
Burned Peak Flow Rate (cfs)	81.9619
24-Hr Clear Runoff Volume (ac-ft)	15.8479
24-Hr Clear Runoff Volume (cu-ft)	690335.7525



Peak Flow Hydrologic Analysis

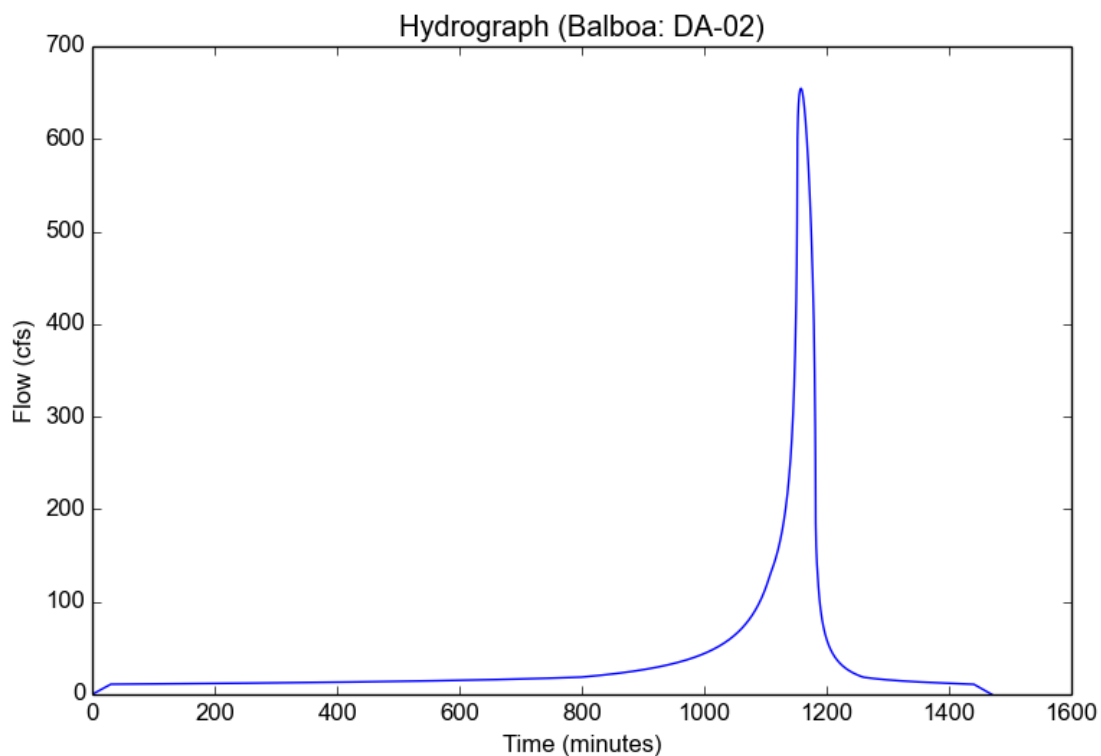
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4314
Undeveloped Runoff Coefficient (Cu)	0.6565
Developed Runoff Coefficient (Cd)	0.6653
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	654.6105
Burned Peak Flow Rate (cfs)	654.6105
24-Hr Clear Runoff Volume (ac-ft)	78.4532
24-Hr Clear Runoff Volume (cu-ft)	3417423.3087



Peak Flow Hydrologic Analysis

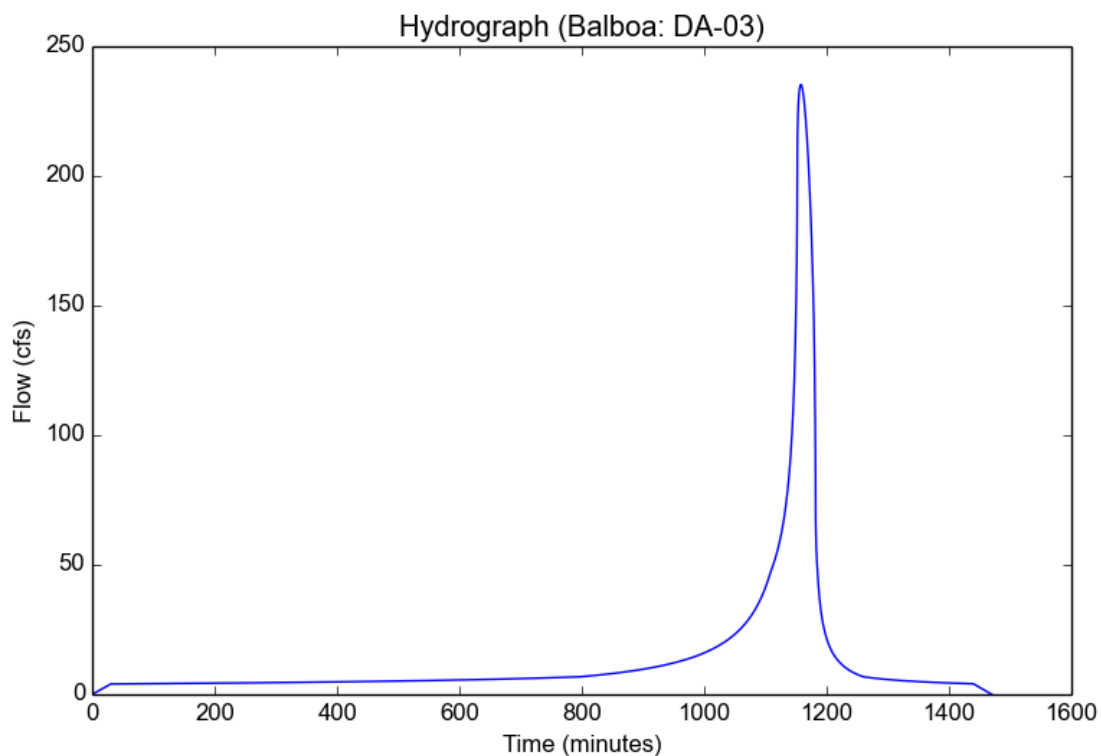
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.039
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4314
Undeveloped Runoff Coefficient (Cu)	0.6565
Developed Runoff Coefficient (Cd)	0.666
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	235.2787
Burned Peak Flow Rate (cfs)	235.2787
24-Hr Clear Runoff Volume (ac-ft)	28.3971
24-Hr Clear Runoff Volume (cu-ft)	1236976.3486



Peak Flow Hydrologic Analysis

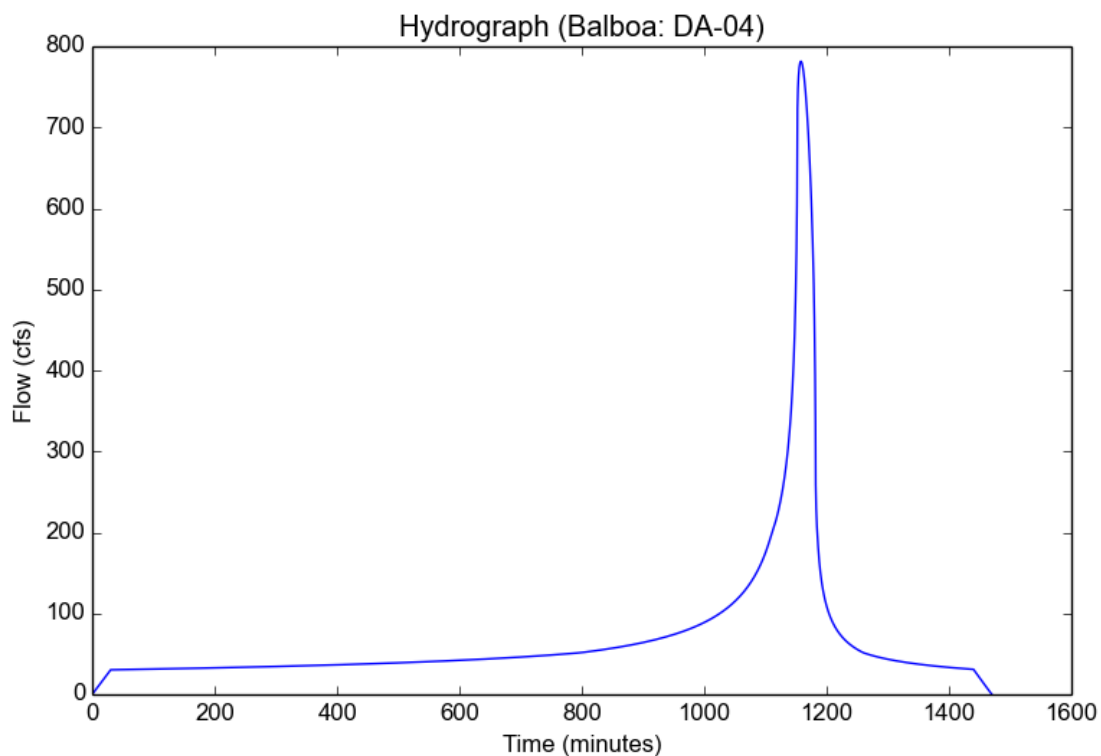
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.282
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4314
Undeveloped Runoff Coefficient (Cu)	0.6565
Developed Runoff Coefficient (Cd)	0.7252
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	781.5313
Burned Peak Flow Rate (cfs)	781.5313
24-Hr Clear Runoff Volume (ac-ft)	143.5894
24-Hr Clear Runoff Volume (cu-ft)	6254756.1814



Peak Flow Hydrologic Analysis

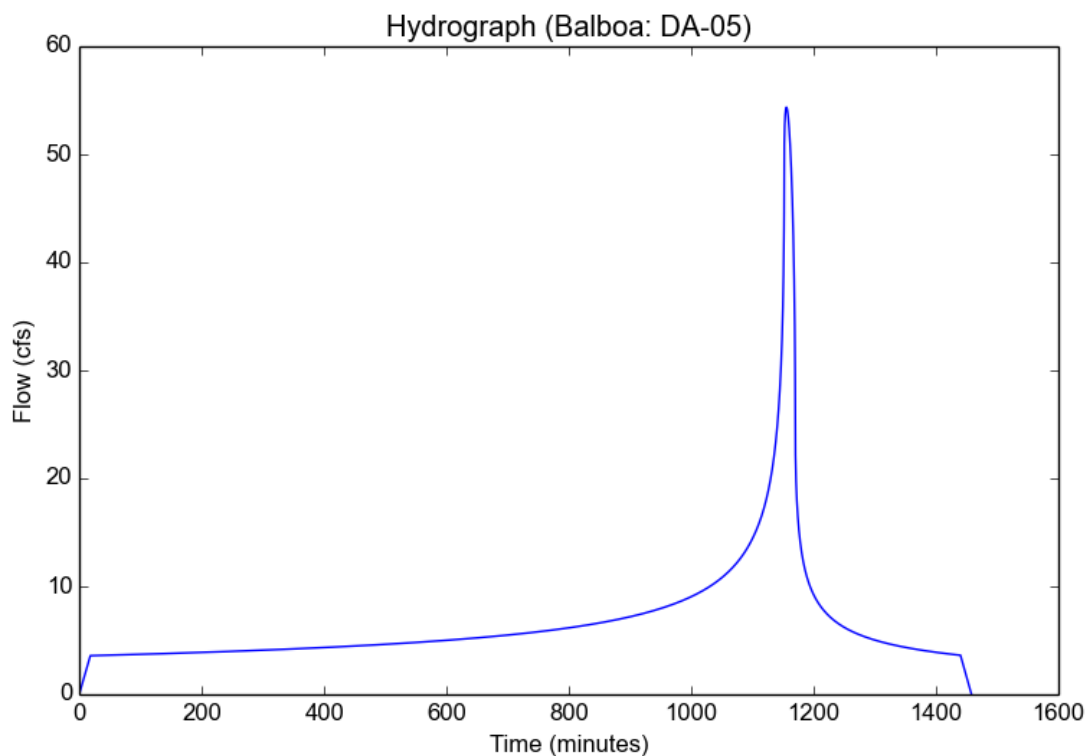
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.959
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.8198
Undeveloped Runoff Coefficient (Cu)	0.7108
Developed Runoff Coefficient (Cd)	0.8922
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	54.3627
Burned Peak Flow Rate (cfs)	54.3627
24-Hr Clear Runoff Volume (ac-ft)	13.4426
24-Hr Clear Runoff Volume (cu-ft)	585558.2885



Peak Flow Hydrologic Analysis

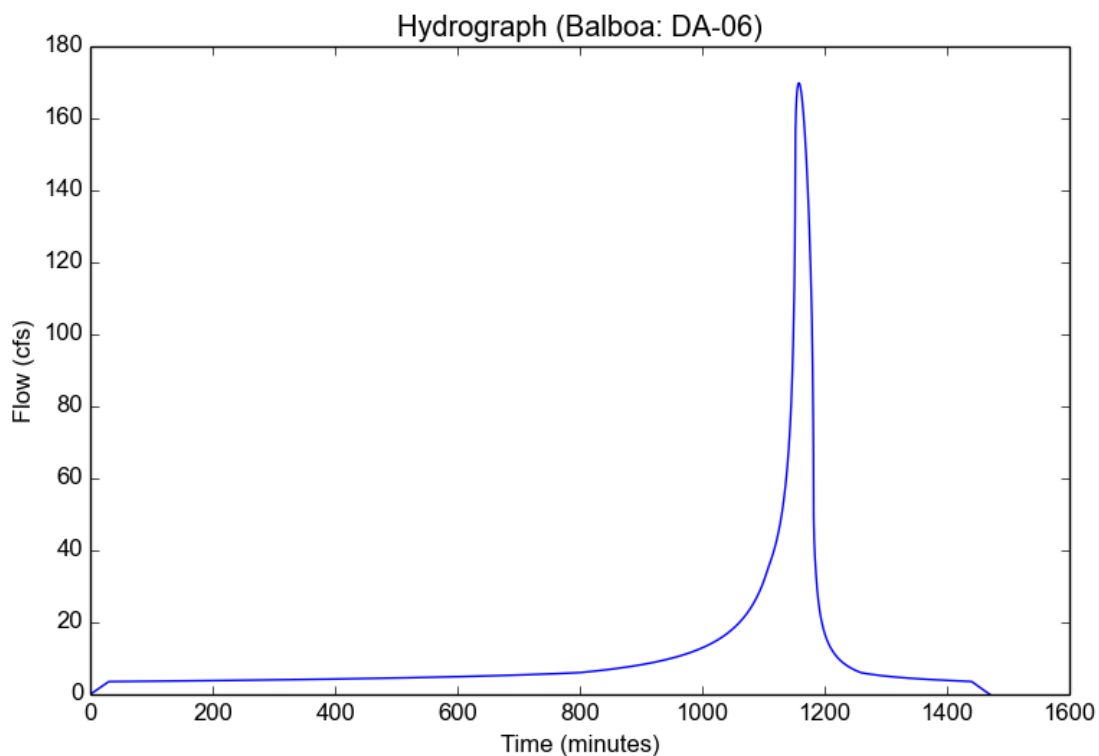
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.079
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4314
Undeveloped Runoff Coefficient (Cu)	0.6565
Developed Runoff Coefficient (Cd)	0.6757
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	169.841
Burned Peak Flow Rate (cfs)	169.841
24-Hr Clear Runoff Volume (ac-ft)	22.3902
24-Hr Clear Runoff Volume (cu-ft)	975316.326



Peak Flow Hydrologic Analysis

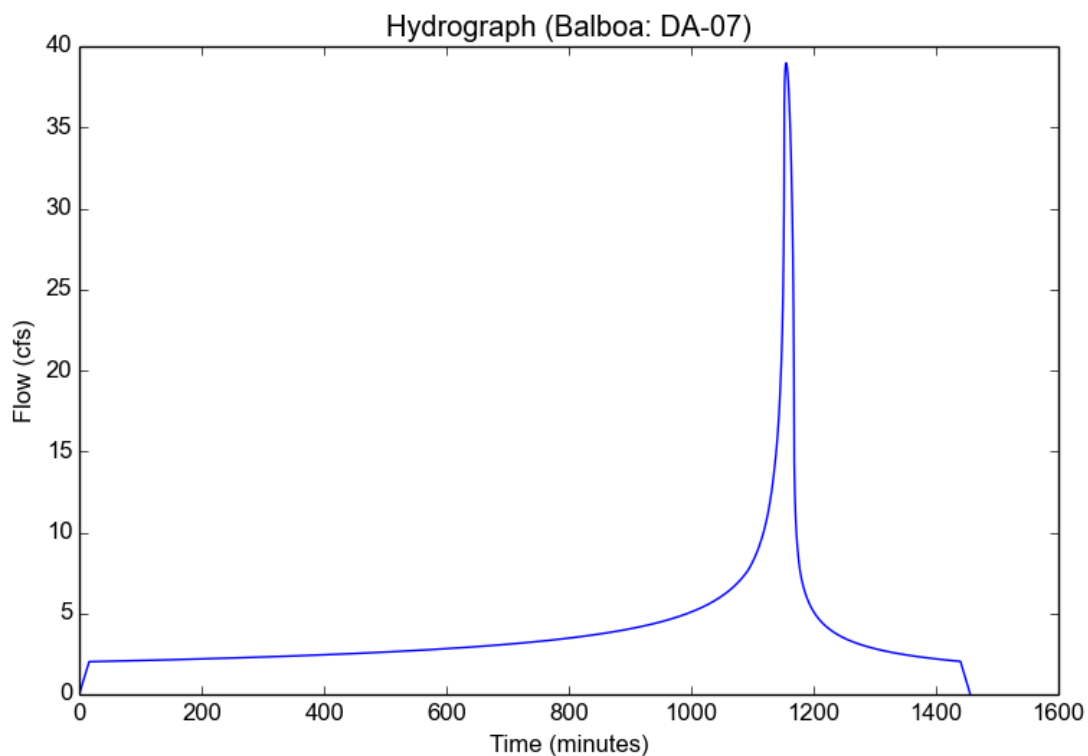
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.68
Soil Type	63
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.9234
Undeveloped Runoff Coefficient (Cu)	0.5828
Developed Runoff Coefficient (Cd)	0.7985
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	38.9803
Burned Peak Flow Rate (cfs)	38.9803
24-Hr Clear Runoff Volume (ac-ft)	7.7484
24-Hr Clear Runoff Volume (cu-ft)	337520.177



Peak Flow Hydrologic Analysis

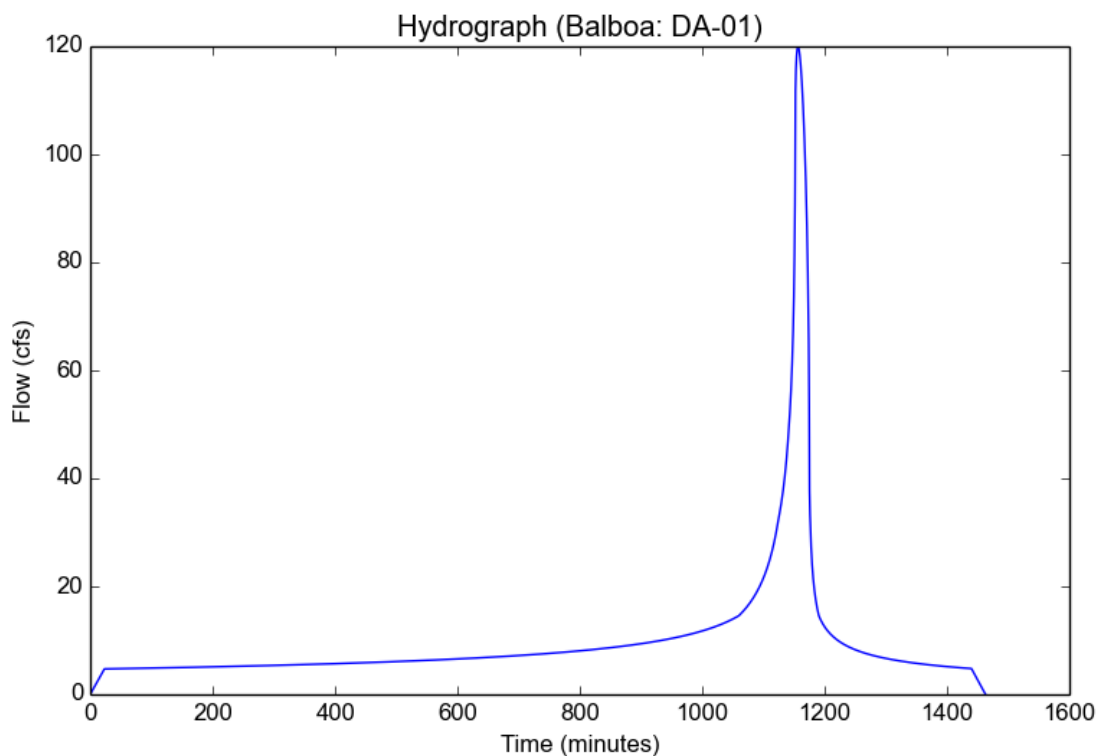
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.321
Soil Type	63
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.9943
Undeveloped Runoff Coefficient (Cu)	0.5935
Developed Runoff Coefficient (Cd)	0.6919
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	119.9263
Burned Peak Flow Rate (cfs)	119.9263
24-Hr Clear Runoff Volume (ac-ft)	20.1075
24-Hr Clear Runoff Volume (cu-ft)	875881.472



Peak Flow Hydrologic Analysis

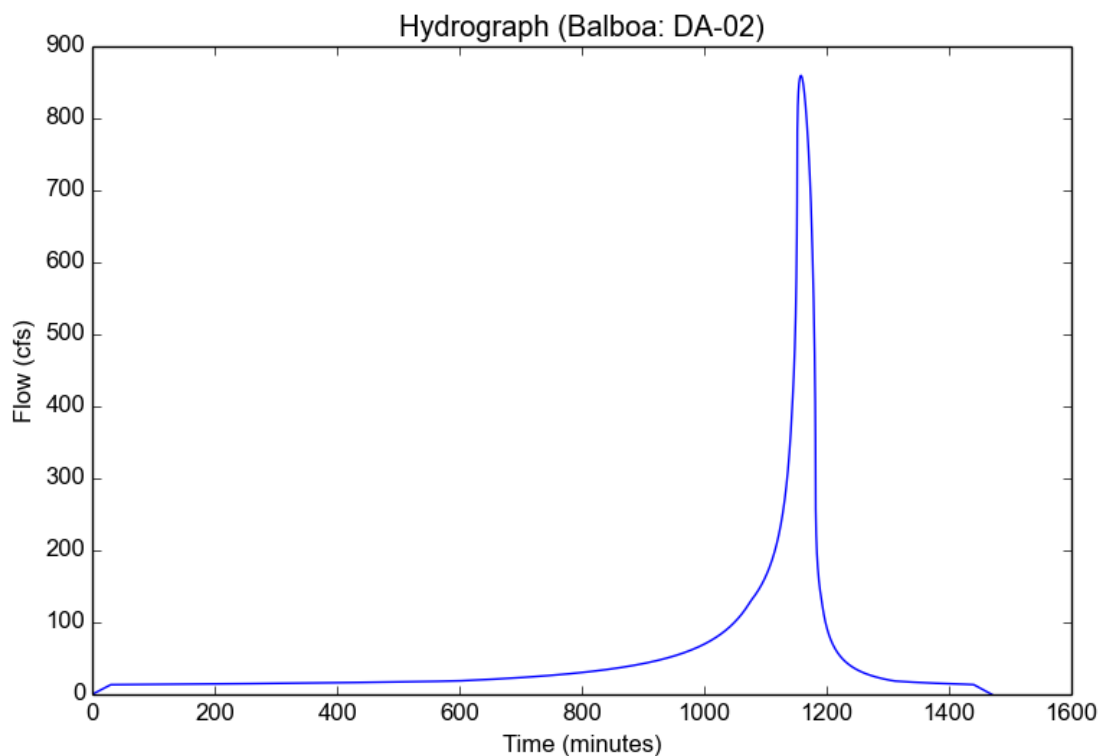
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.7602
Undeveloped Runoff Coefficient (Cu)	0.7033
Developed Runoff Coefficient (Cd)	0.7104
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	859.5754
Burned Peak Flow Rate (cfs)	859.5754
24-Hr Clear Runoff Volume (ac-ft)	109.4329
24-Hr Clear Runoff Volume (cu-ft)	4766899.1768



Peak Flow Hydrologic Analysis

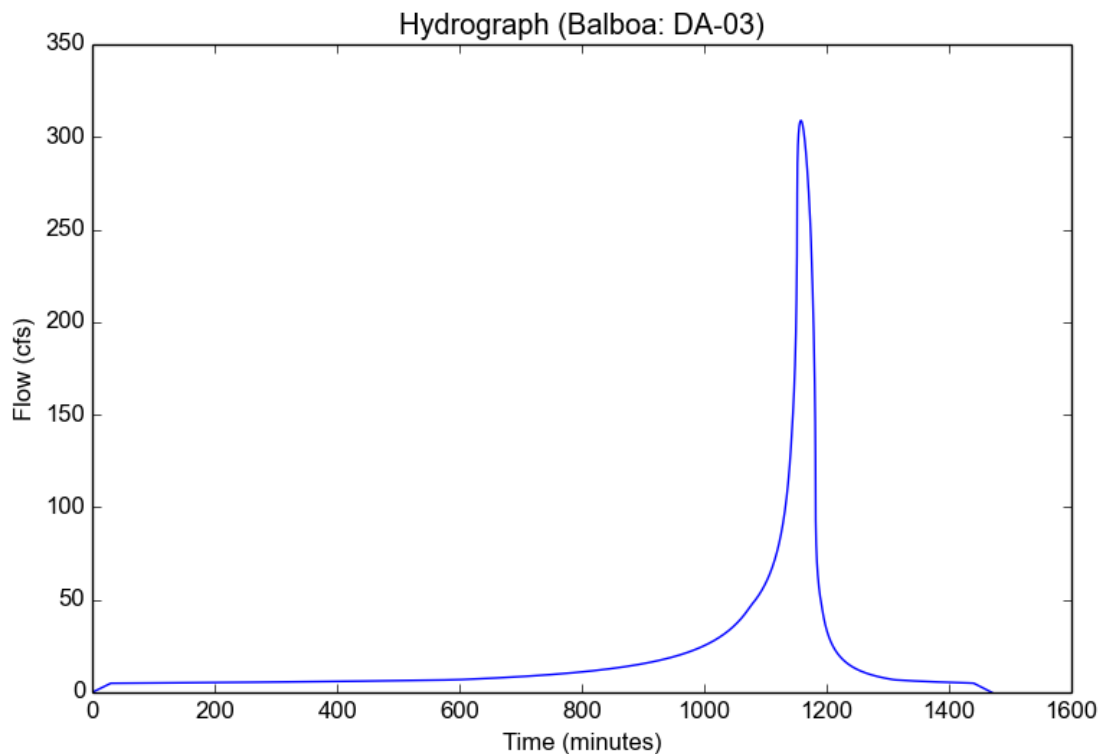
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.039
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.7602
Undeveloped Runoff Coefficient (Cu)	0.7033
Developed Runoff Coefficient (Cd)	0.711
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	308.8642
Burned Peak Flow Rate (cfs)	308.8642
24-Hr Clear Runoff Volume (ac-ft)	39.558
24-Hr Clear Runoff Volume (cu-ft)	1723145.5682



Peak Flow Hydrologic Analysis

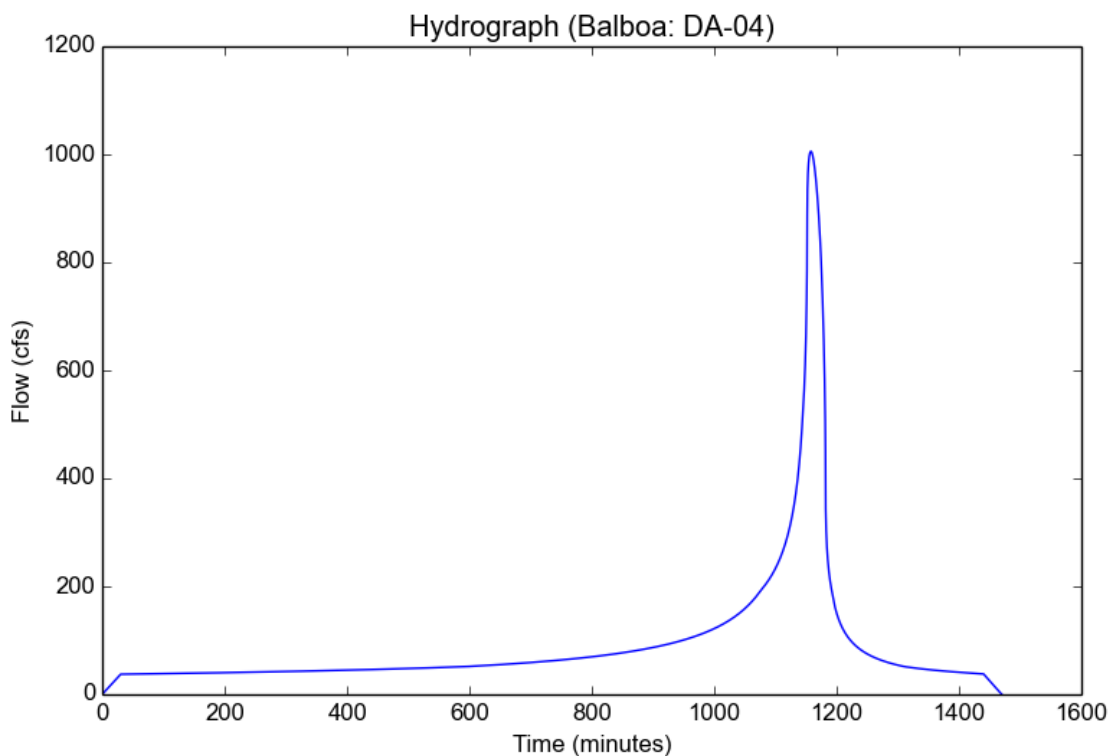
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.282
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.7602
Undeveloped Runoff Coefficient (Cu)	0.7033
Developed Runoff Coefficient (Cd)	0.7588
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1005.5889
Burned Peak Flow Rate (cfs)	1005.5889
24-Hr Clear Runoff Volume (ac-ft)	187.1429
24-Hr Clear Runoff Volume (cu-ft)	8151943.1843



Peak Flow Hydrologic Analysis

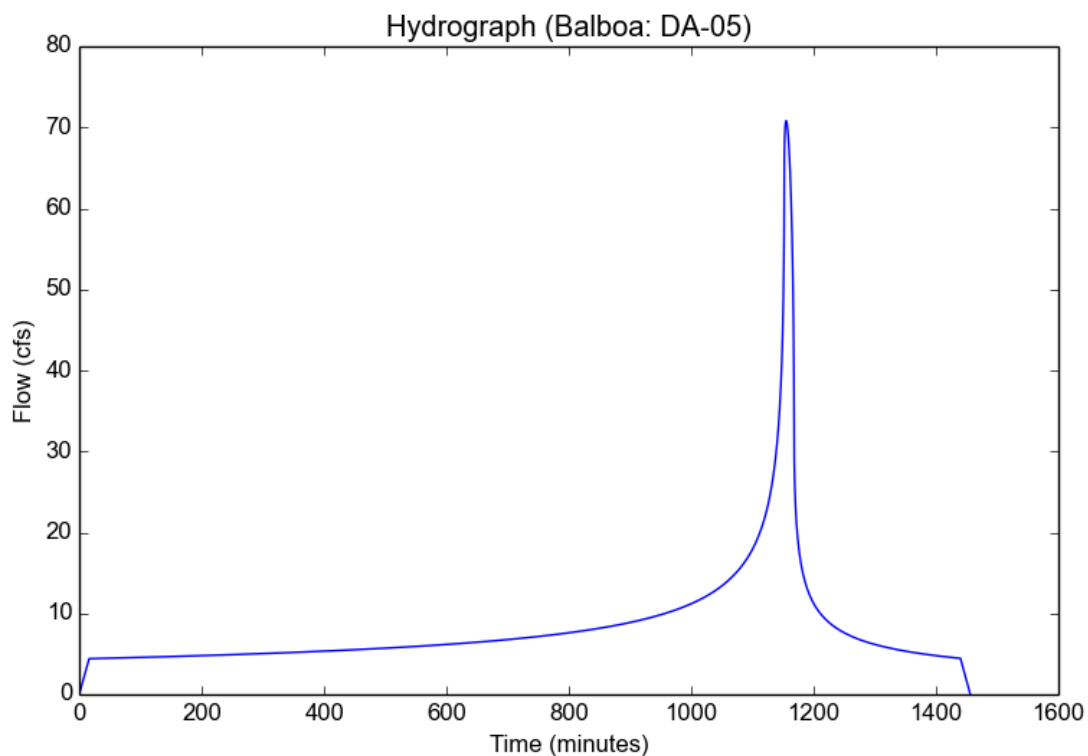
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.959
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	2.3652
Undeveloped Runoff Coefficient (Cu)	0.759
Developed Runoff Coefficient (Cd)	0.8942
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	70.8109
Burned Peak Flow Rate (cfs)	70.8109
24-Hr Clear Runoff Volume (ac-ft)	16.5567
24-Hr Clear Runoff Volume (cu-ft)	721211.8973



Peak Flow Hydrologic Analysis

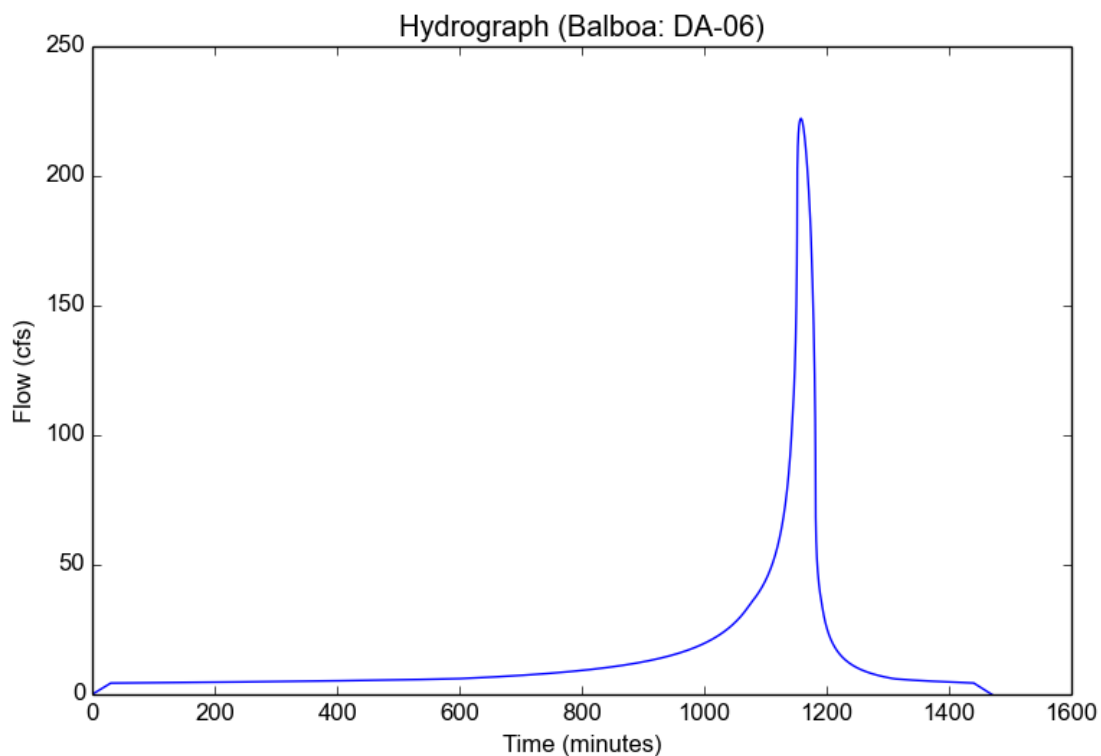
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.079
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.7602
Undeveloped Runoff Coefficient (Cu)	0.7033
Developed Runoff Coefficient (Cd)	0.7189
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	222.1782
Burned Peak Flow Rate (cfs)	222.1782
24-Hr Clear Runoff Volume (ac-ft)	30.6957
24-Hr Clear Runoff Volume (cu-ft)	1337104.1336



Peak Flow Hydrologic Analysis

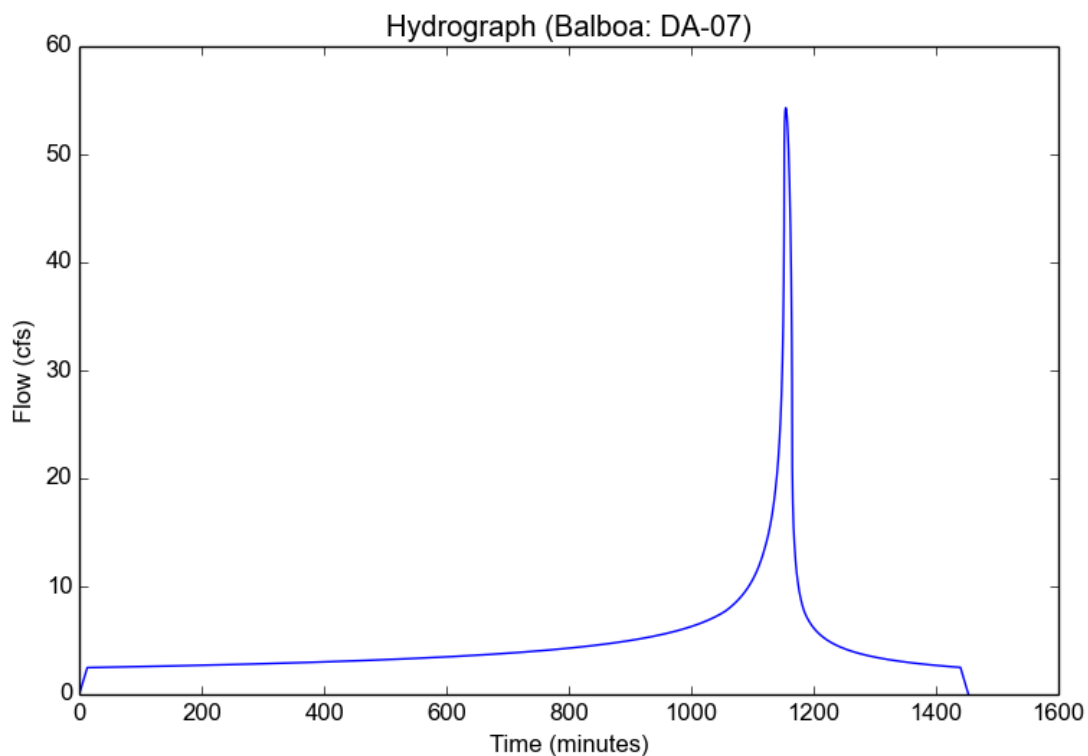
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.68
Soil Type	63
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	2.6077
Undeveloped Runoff Coefficient (Cu)	0.6519
Developed Runoff Coefficient (Cd)	0.8206
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	54.3104
Burned Peak Flow Rate (cfs)	54.3104
24-Hr Clear Runoff Volume (ac-ft)	9.6097
24-Hr Clear Runoff Volume (cu-ft)	418599.7783



Peak Flow Hydrologic Analysis

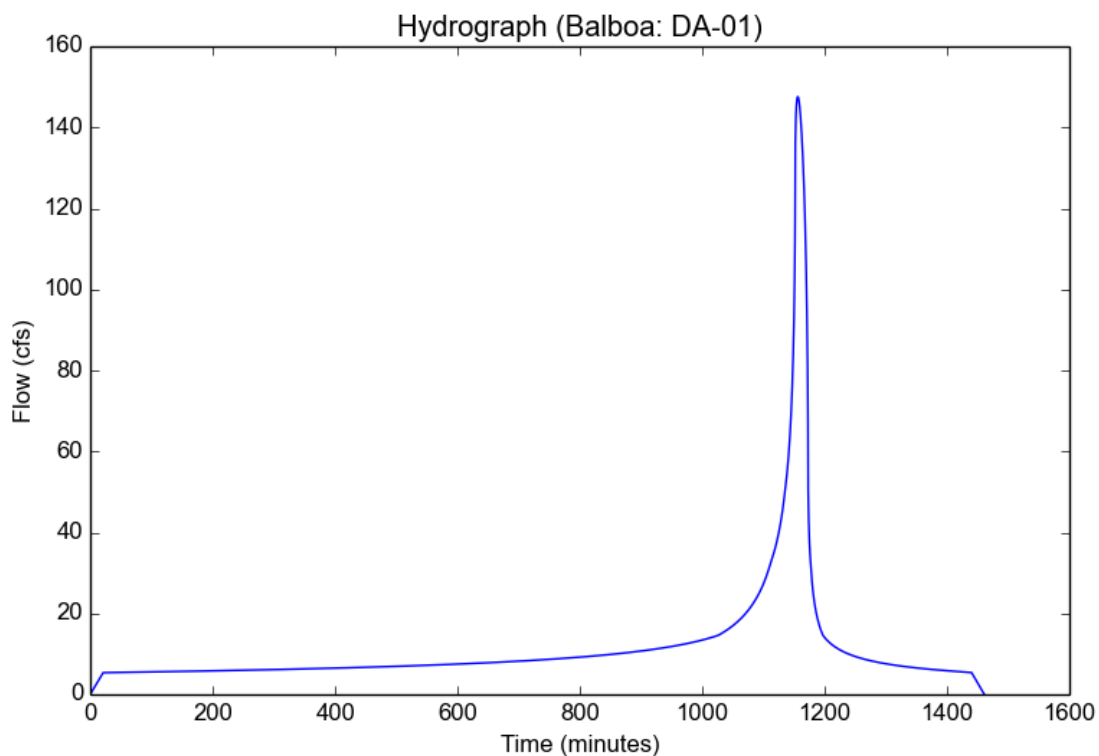
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.321
Soil Type	63
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.3707
Undeveloped Runoff Coefficient (Cu)	0.6295
Developed Runoff Coefficient (Cd)	0.7163
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	147.5849
Burned Peak Flow Rate (cfs)	147.5849
24-Hr Clear Runoff Volume (ac-ft)	23.4063
24-Hr Clear Runoff Volume (cu-ft)	1019577.6393



Peak Flow Hydrologic Analysis

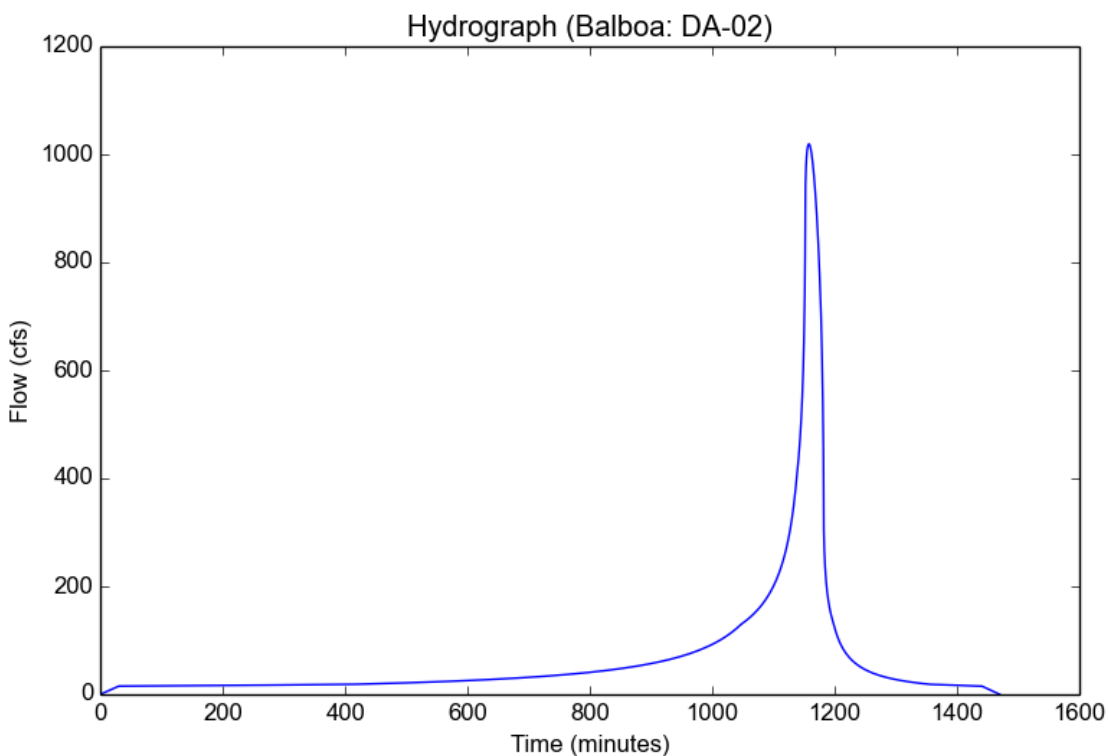
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.0048
Undeveloped Runoff Coefficient (Cu)	0.7336
Developed Runoff Coefficient (Cd)	0.7395
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1019.1852
Burned Peak Flow Rate (cfs)	1019.1852
24-Hr Clear Runoff Volume (ac-ft)	135.7862
24-Hr Clear Runoff Volume (cu-ft)	5914847.7419



Peak Flow Hydrologic Analysis

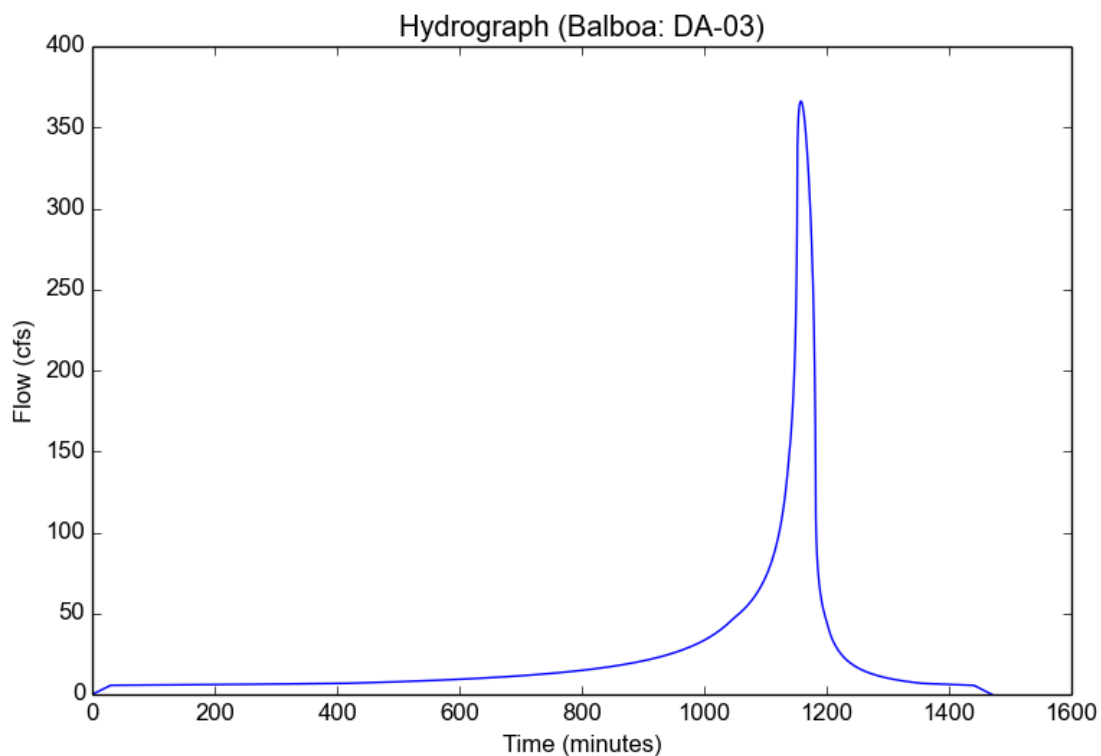
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Existing Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.039
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.0048
Undeveloped Runoff Coefficient (Cu)	0.7336
Developed Runoff Coefficient (Cd)	0.74
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	366.1586
Burned Peak Flow Rate (cfs)	366.1586
24-Hr Clear Runoff Volume (ac-ft)	49.0443
24-Hr Clear Runoff Volume (cu-ft)	2136371.6602



Peak Flow Hydrologic Analysis

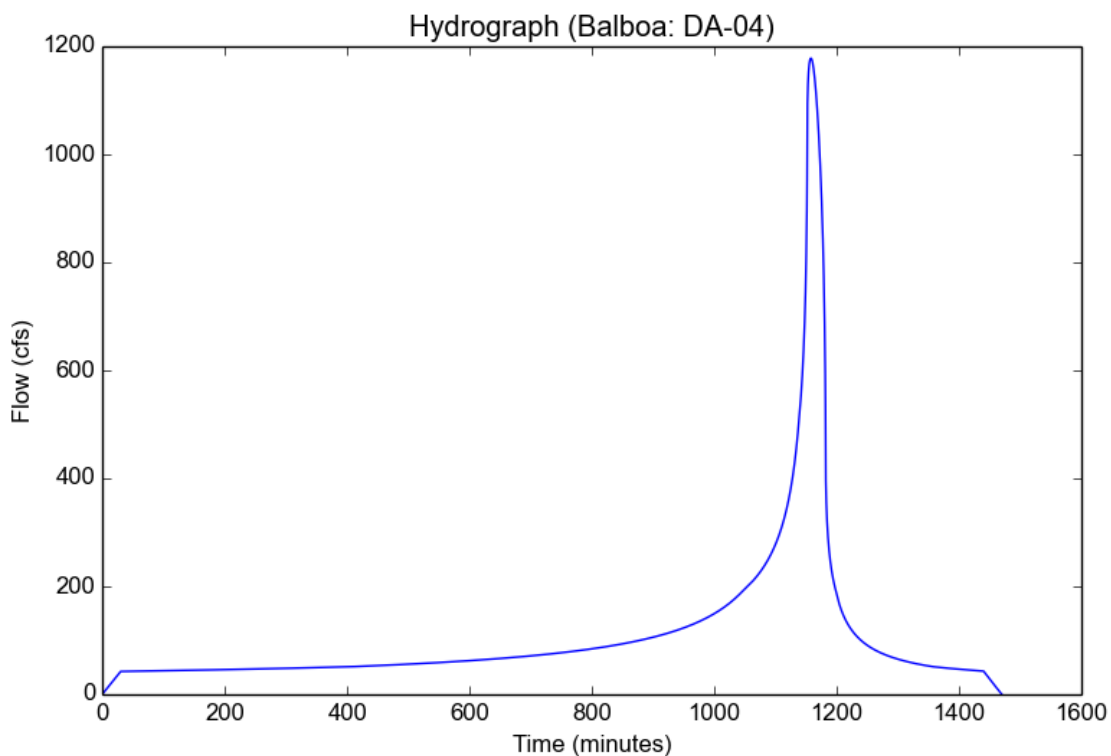
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.282
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.0048
Undeveloped Runoff Coefficient (Cu)	0.7336
Developed Runoff Coefficient (Cd)	0.7805
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1178.0871
Burned Peak Flow Rate (cfs)	1178.0871
24-Hr Clear Runoff Volume (ac-ft)	222.2404
24-Hr Clear Runoff Volume (cu-ft)	9680793.5077



Peak Flow Hydrologic Analysis

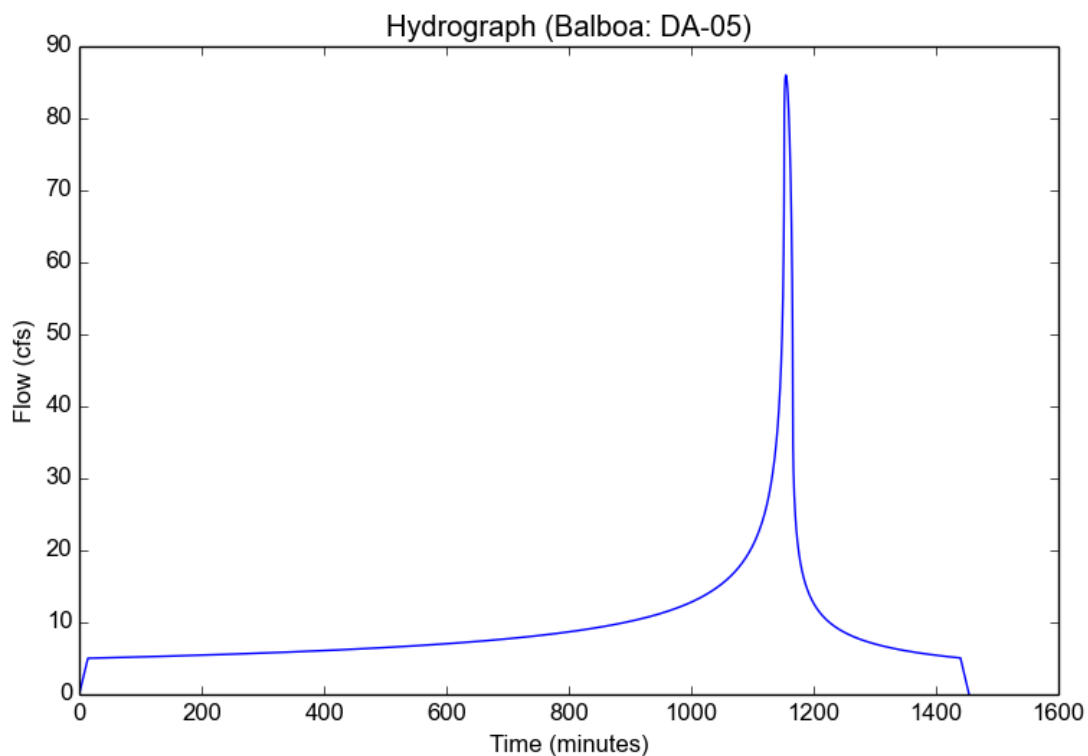
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.959
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.8684
Undeveloped Runoff Coefficient (Cu)	0.7944
Developed Runoff Coefficient (Cd)	0.8957
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	86.0137
Burned Peak Flow Rate (cfs)	86.0137
24-Hr Clear Runoff Volume (ac-ft)	18.8803
24-Hr Clear Runoff Volume (cu-ft)	822424.9045



Peak Flow Hydrologic Analysis

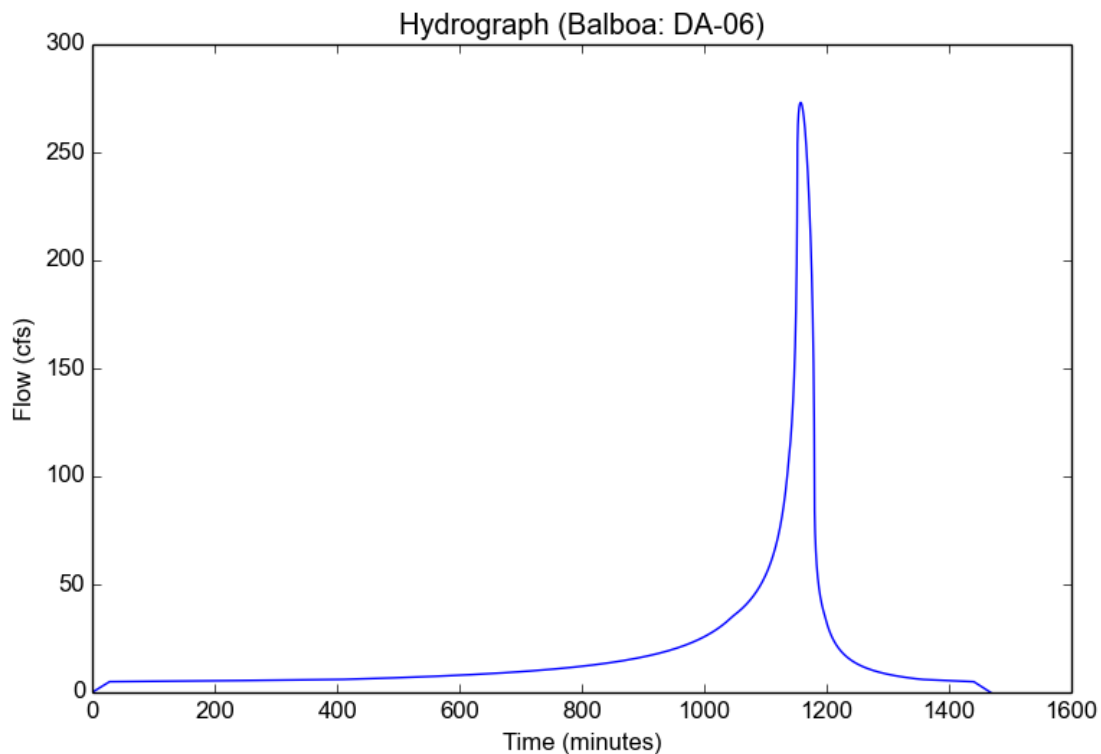
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.079
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.0709
Undeveloped Runoff Coefficient (Cu)	0.7382
Developed Runoff Coefficient (Cd)	0.751
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	273.0762
Burned Peak Flow Rate (cfs)	273.0762
24-Hr Clear Runoff Volume (ac-ft)	37.6996
24-Hr Clear Runoff Volume (cu-ft)	1642196.4643



Peak Flow Hydrologic Analysis

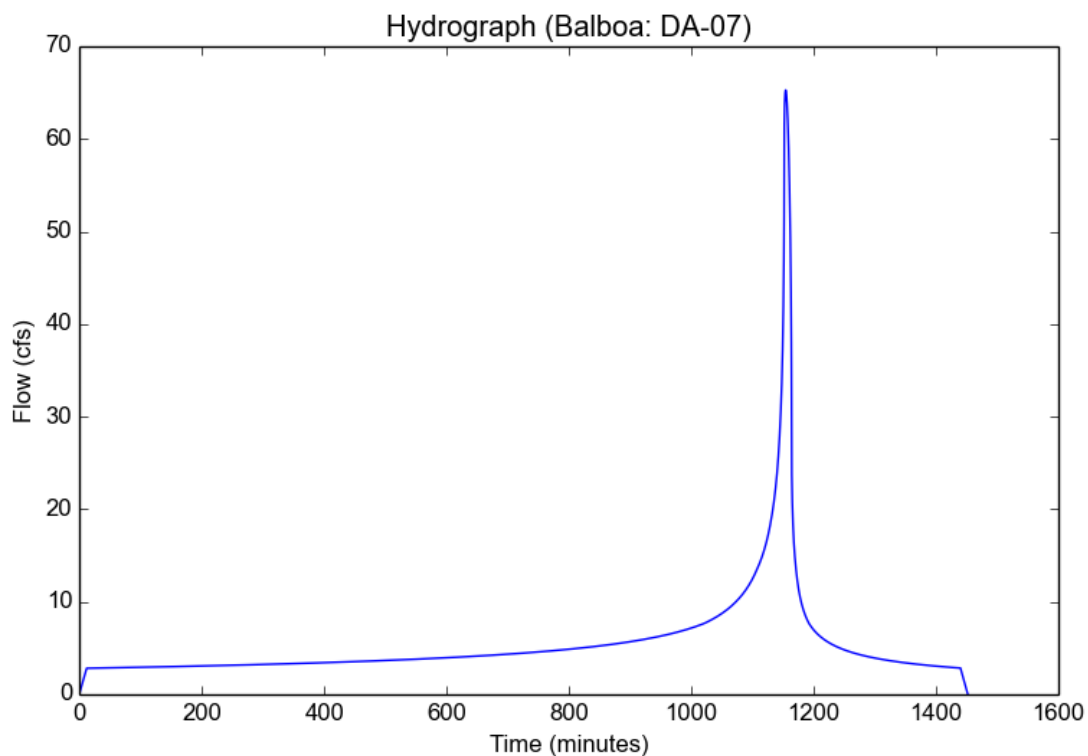
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.68
Soil Type	63
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	3.0839
Undeveloped Runoff Coefficient (Cu)	0.6939
Developed Runoff Coefficient (Cd)	0.8341
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	65.2806
Burned Peak Flow Rate (cfs)	65.2806
24-Hr Clear Runoff Volume (ac-ft)	11.0156
24-Hr Clear Runoff Volume (cu-ft)	479841.5497



Peak Flow Hydrologic Analysis

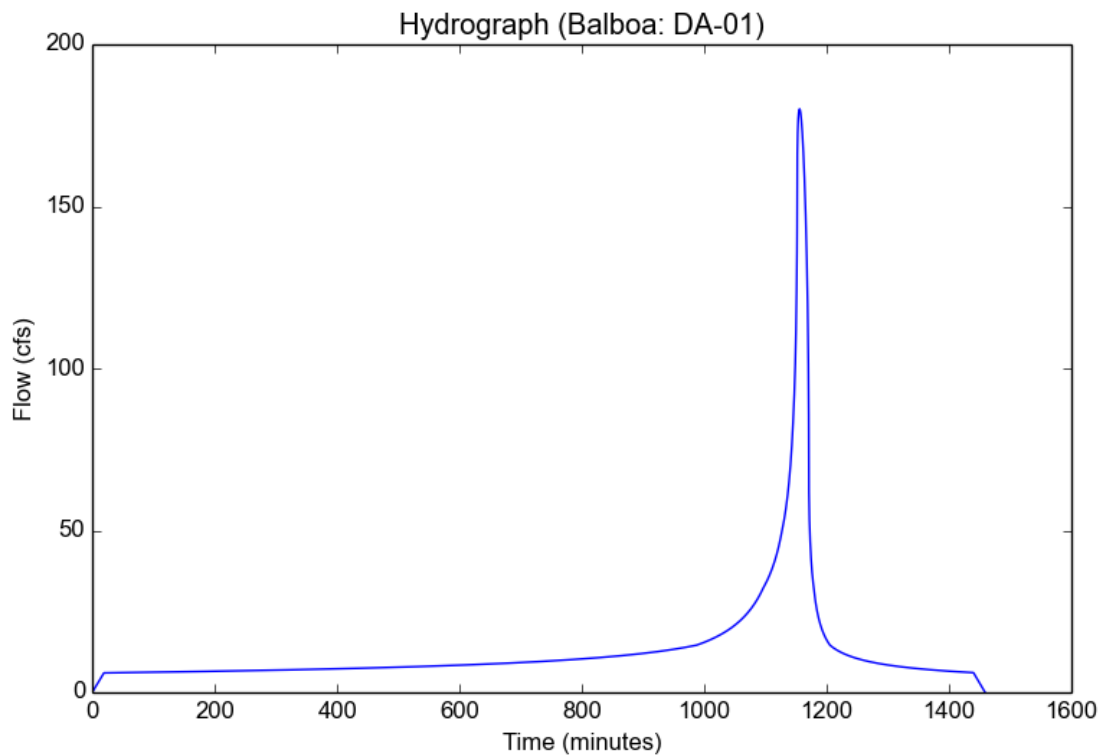
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.321
Soil Type	63
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.788
Undeveloped Runoff Coefficient (Cu)	0.669
Developed Runoff Coefficient (Cd)	0.7431
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	180.0642
Burned Peak Flow Rate (cfs)	180.0642
24-Hr Clear Runoff Volume (ac-ft)	26.8442
24-Hr Clear Runoff Volume (cu-ft)	1169332.7626



Peak Flow Hydrologic Analysis

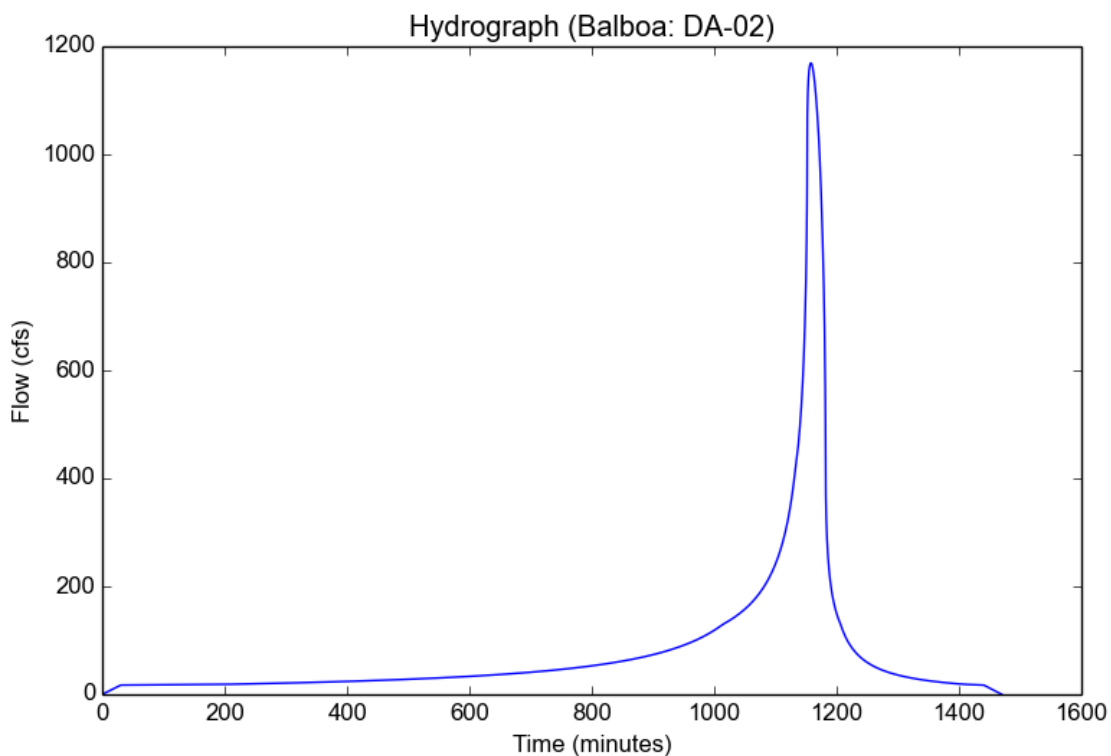
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.2494
Undeveloped Runoff Coefficient (Cu)	0.7508
Developed Runoff Coefficient (Cd)	0.7562
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1169.2221
Burned Peak Flow Rate (cfs)	1169.2221
24-Hr Clear Runoff Volume (ac-ft)	164.8343
24-Hr Clear Runoff Volume (cu-ft)	7180183.0335



Peak Flow Hydrologic Analysis

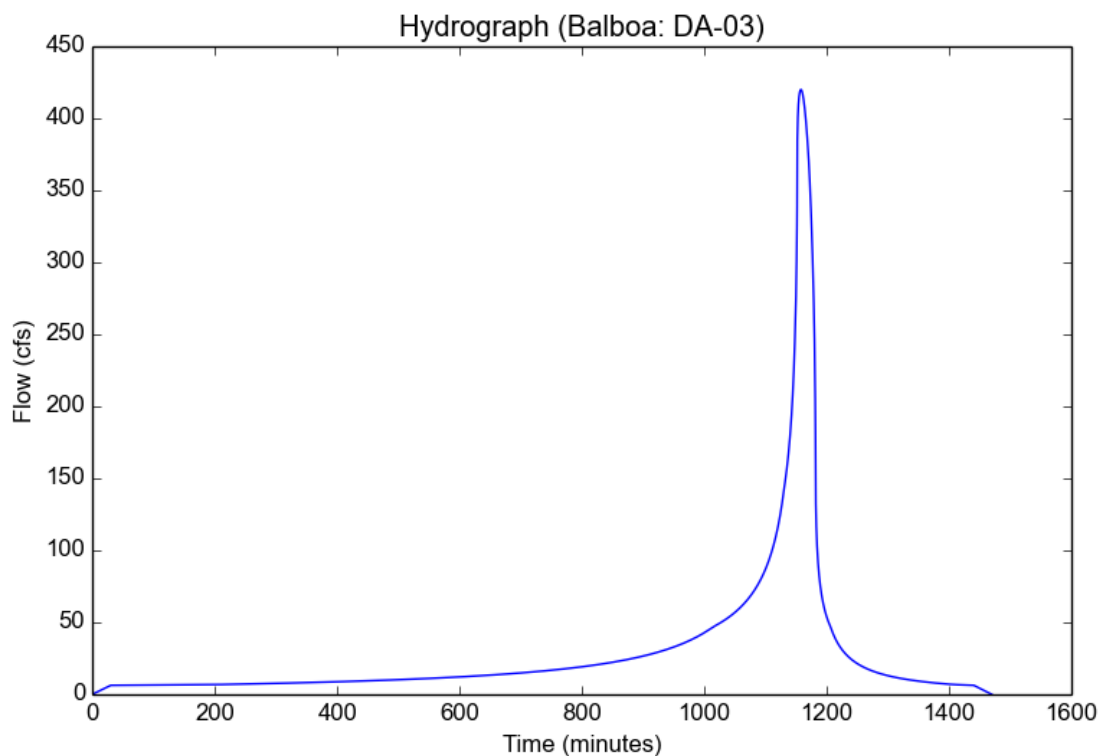
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.039
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.2494
Undeveloped Runoff Coefficient (Cu)	0.7508
Developed Runoff Coefficient (Cd)	0.7566
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	420.0268
Burned Peak Flow Rate (cfs)	420.0268
24-Hr Clear Runoff Volume (ac-ft)	59.4952
24-Hr Clear Runoff Volume (cu-ft)	2591611.2013



Peak Flow Hydrologic Analysis

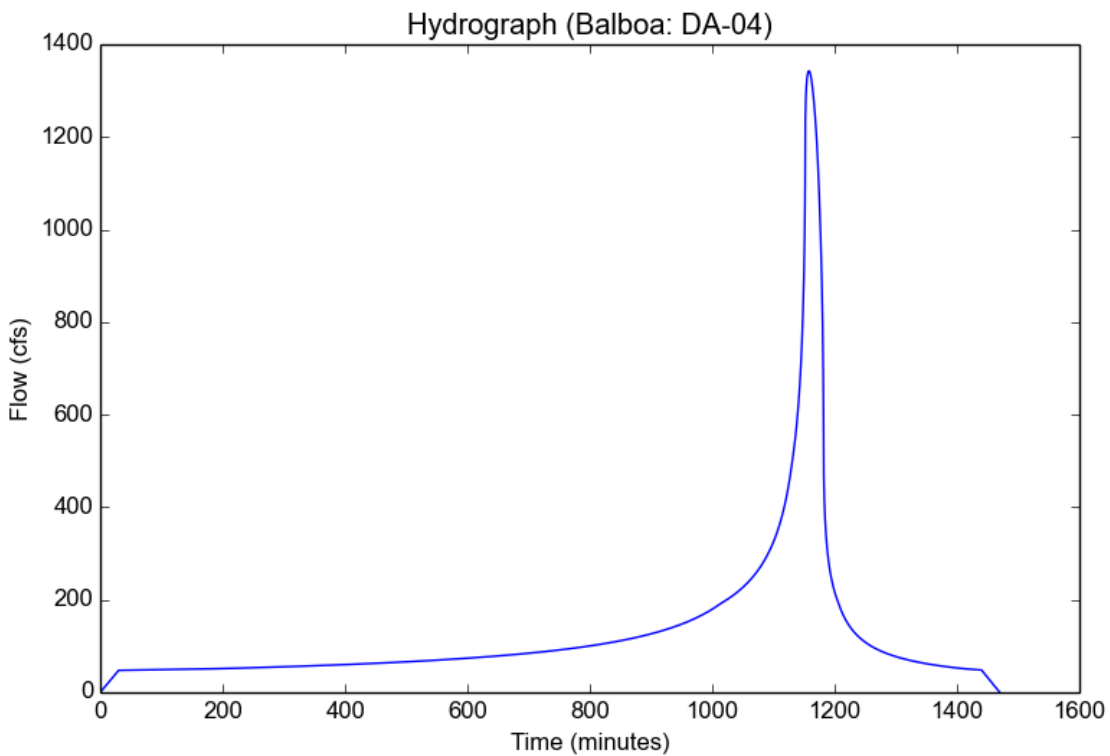
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.282
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.2494
Undeveloped Runoff Coefficient (Cu)	0.7508
Developed Runoff Coefficient (Cd)	0.7929
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1342.7761
Burned Peak Flow Rate (cfs)	1342.7761
24-Hr Clear Runoff Volume (ac-ft)	259.5364
24-Hr Clear Runoff Volume (cu-ft)	11305404.5292



Peak Flow Hydrologic Analysis

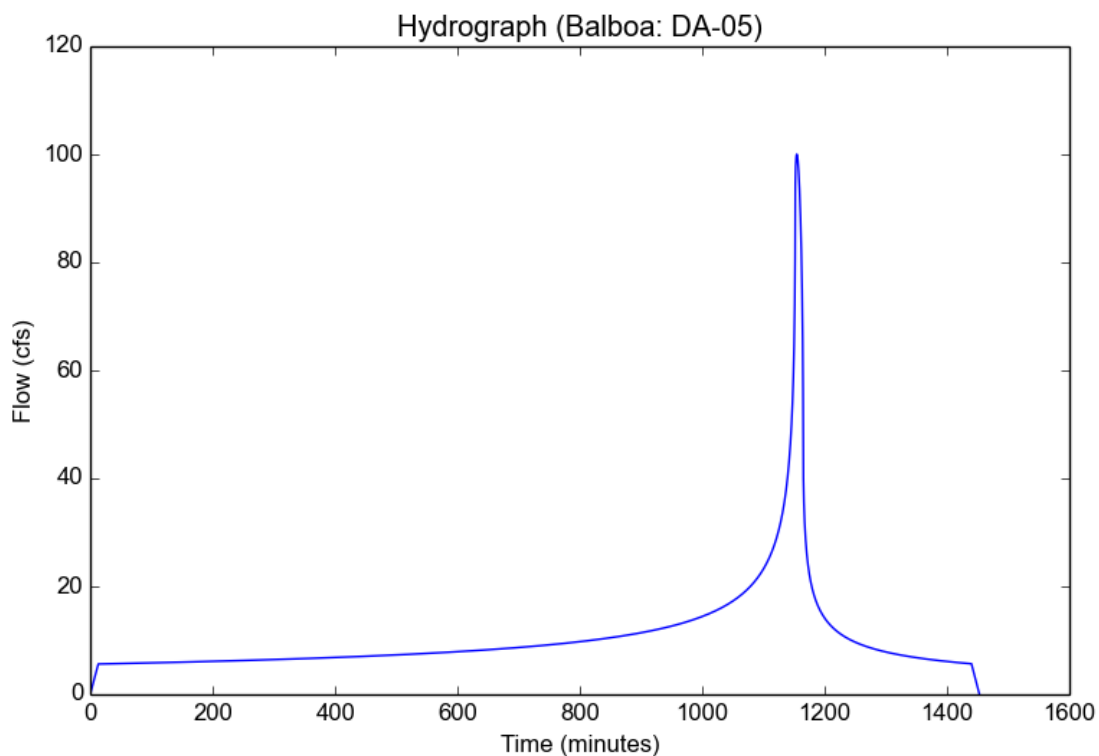
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.959
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	3.3324
Undeveloped Runoff Coefficient (Cu)	0.8166
Developed Runoff Coefficient (Cd)	0.8966
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	100.0293
Burned Peak Flow Rate (cfs)	100.0293
24-Hr Clear Runoff Volume (ac-ft)	21.2097
24-Hr Clear Runoff Volume (cu-ft)	923894.2209



Peak Flow Hydrologic Analysis

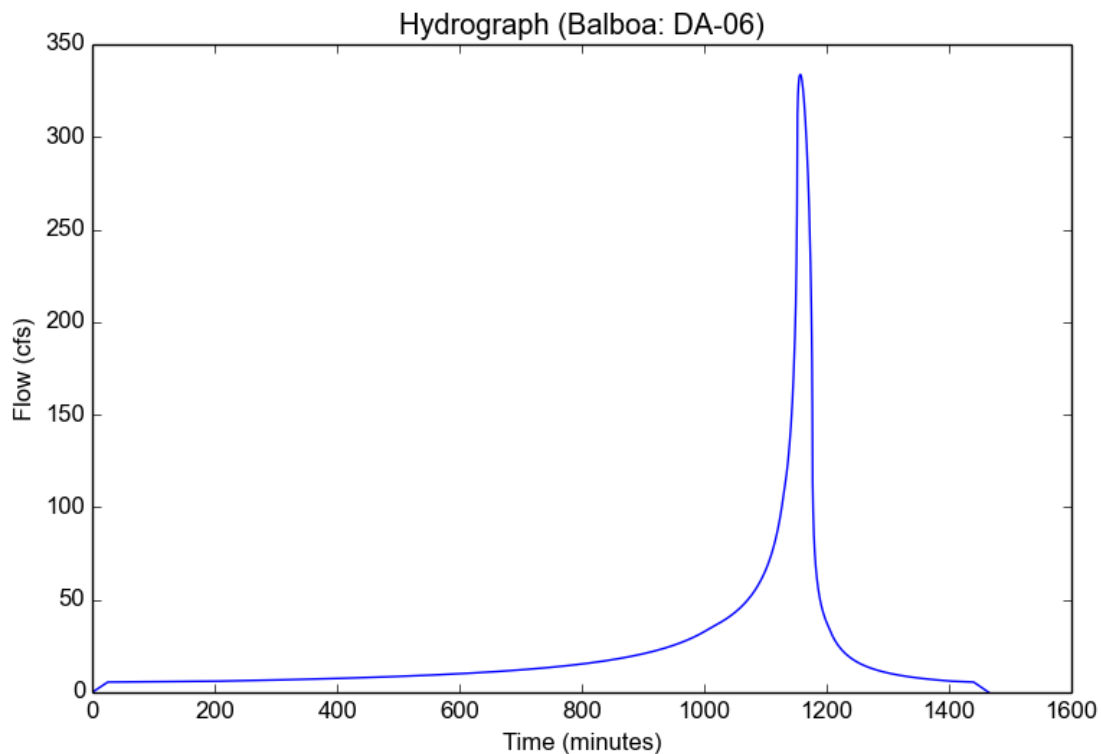
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.079
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.4506
Undeveloped Runoff Coefficient (Cu)	0.765
Developed Runoff Coefficient (Cd)	0.7756
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	333.7616
Burned Peak Flow Rate (cfs)	333.7616
24-Hr Clear Runoff Volume (ac-ft)	45.3586
24-Hr Clear Runoff Volume (cu-ft)	1975822.0044



Peak Flow Hydrologic Analysis

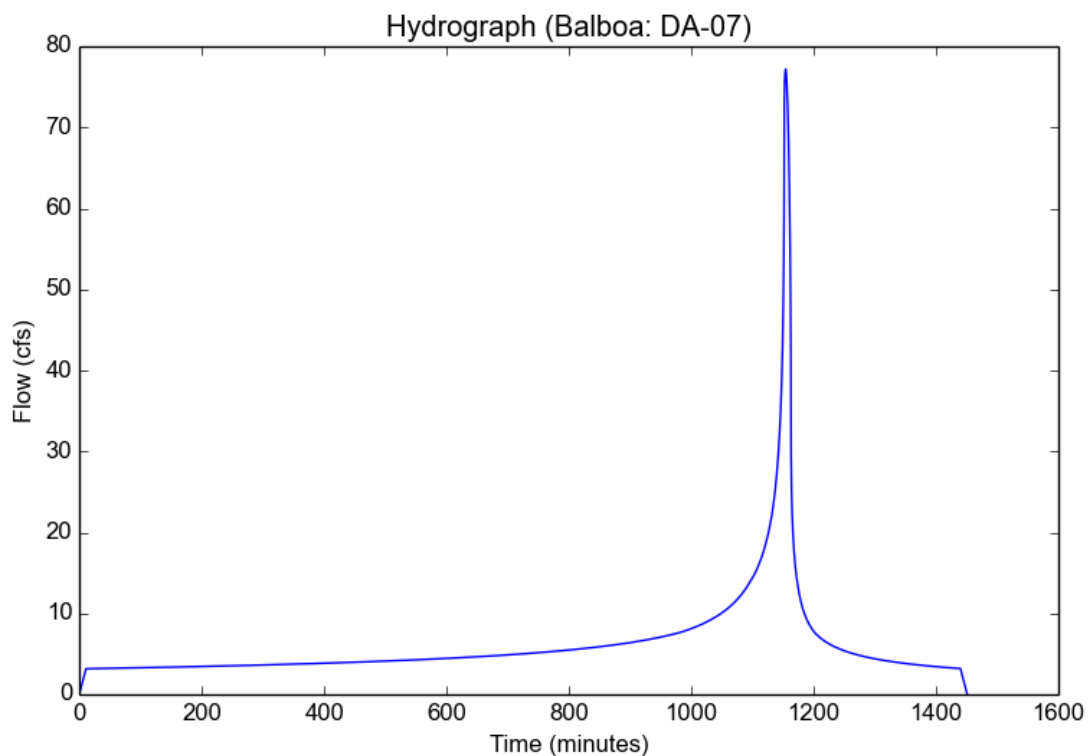
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.68
Soil Type	63
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	3.6046
Undeveloped Runoff Coefficient (Cu)	0.7242
Developed Runoff Coefficient (Cd)	0.8438
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	77.1894
Burned Peak Flow Rate (cfs)	77.1894
24-Hr Clear Runoff Volume (ac-ft)	12.4381
24-Hr Clear Runoff Volume (cu-ft)	541804.5323



Peak Flow Hydrologic Analysis

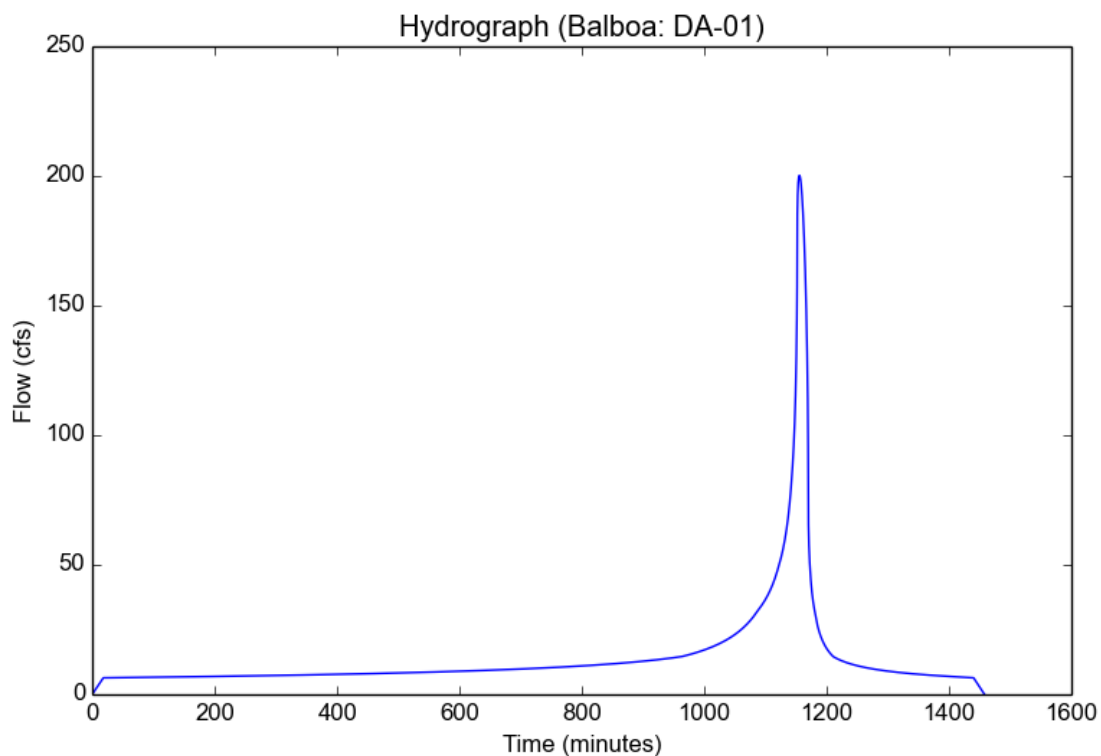
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.321
Soil Type	63
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	3.0382
Undeveloped Runoff Coefficient (Cu)	0.6913
Developed Runoff Coefficient (Cd)	0.7583
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	200.2174
Burned Peak Flow Rate (cfs)	200.2174
24-Hr Clear Runoff Volume (ac-ft)	28.8845
24-Hr Clear Runoff Volume (cu-ft)	1258210.3415



Peak Flow Hydrologic Analysis

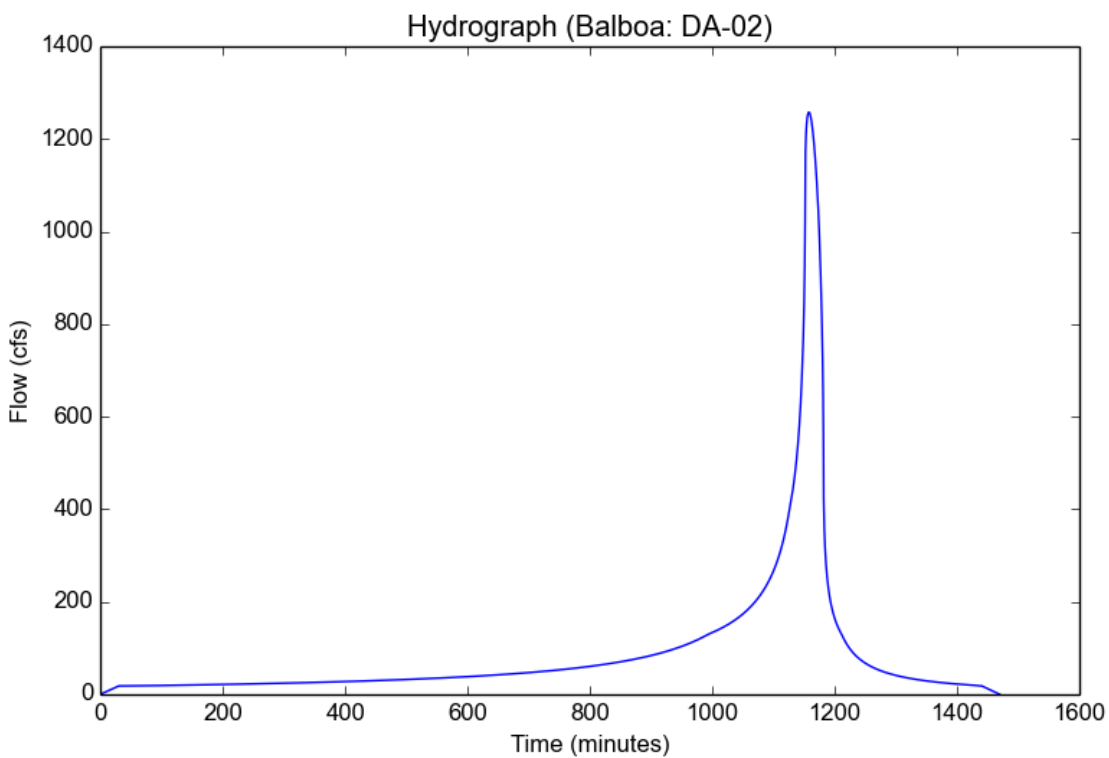
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	2.3897
Undeveloped Runoff Coefficient (Cu)	0.7607
Developed Runoff Coefficient (Cd)	0.7657
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1257.8318
Burned Peak Flow Rate (cfs)	1257.8318
24-Hr Clear Runoff Volume (ac-ft)	182.7914
24-Hr Clear Runoff Volume (cu-ft)	7962392.279



Peak Flow Hydrologic Analysis

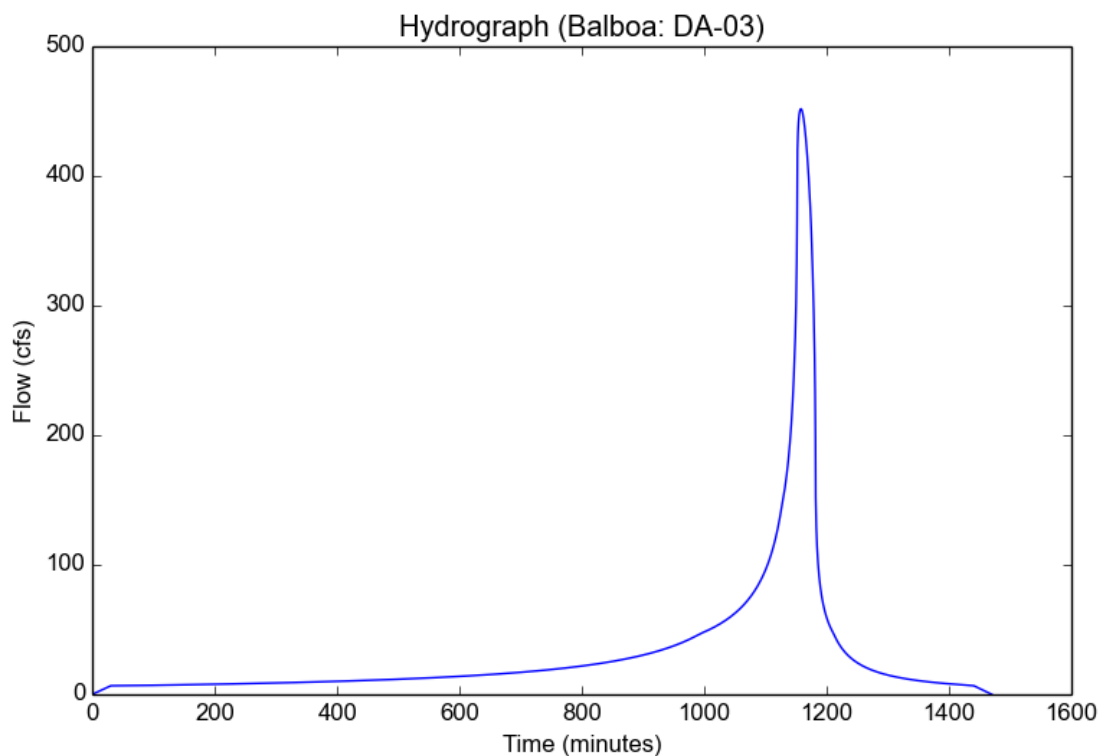
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.039
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	2.3897
Undeveloped Runoff Coefficient (Cu)	0.7607
Developed Runoff Coefficient (Cd)	0.7661
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	451.8378
Burned Peak Flow Rate (cfs)	451.8378
24-Hr Clear Runoff Volume (ac-ft)	65.9533
24-Hr Clear Runoff Volume (cu-ft)	2872927.5463



Peak Flow Hydrologic Analysis

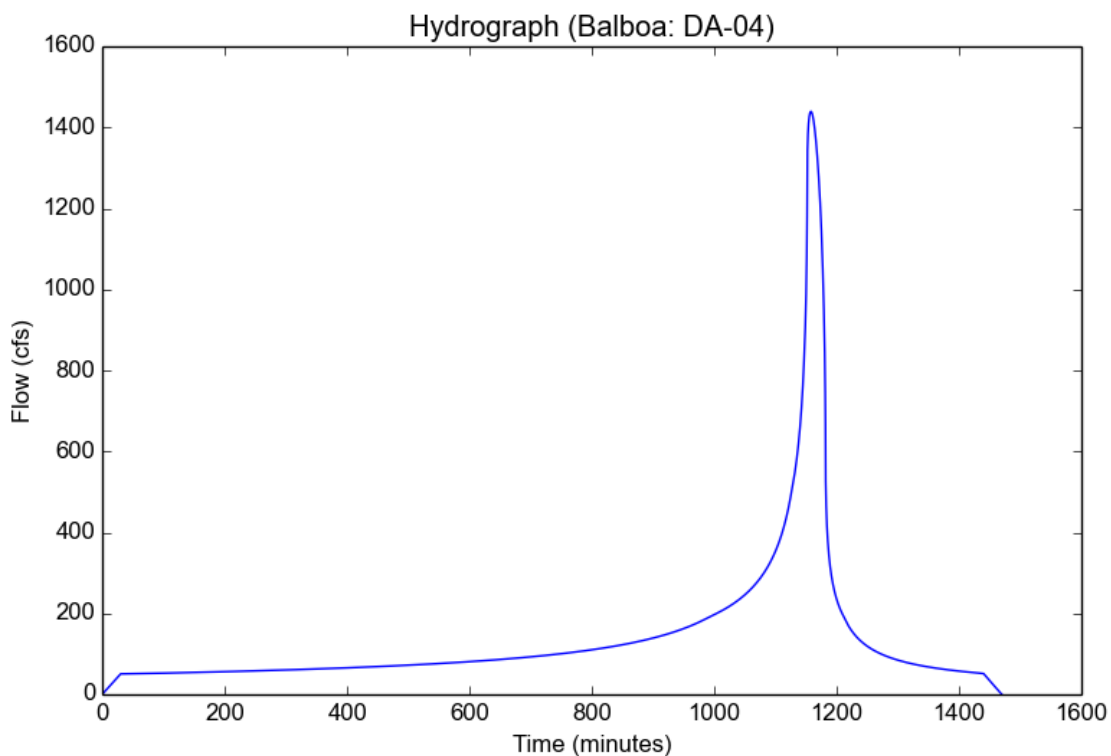
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.282
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	2.3897
Undeveloped Runoff Coefficient (Cu)	0.7607
Developed Runoff Coefficient (Cd)	0.8
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1439.3279
Burned Peak Flow Rate (cfs)	1439.3279
24-Hr Clear Runoff Volume (ac-ft)	281.9881
24-Hr Clear Runoff Volume (cu-ft)	12283402.4396



Peak Flow Hydrologic Analysis

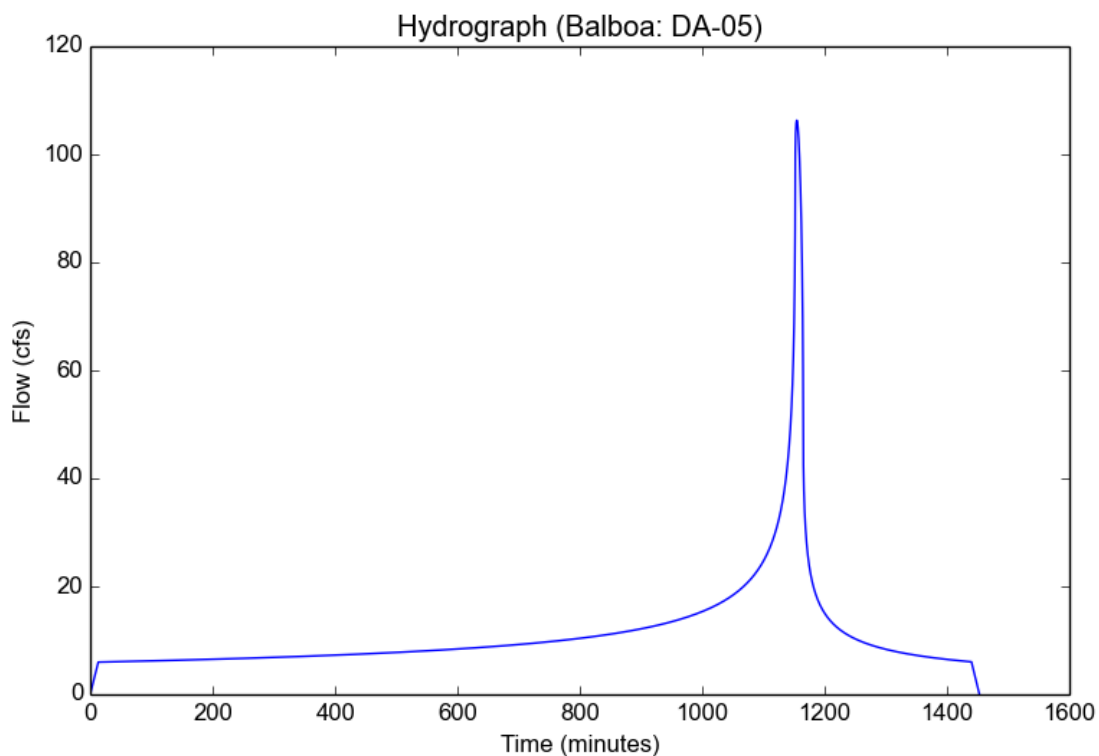
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.959
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	3.5403
Undeveloped Runoff Coefficient (Cu)	0.8246
Developed Runoff Coefficient (Cd)	0.8969
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	106.3092
Burned Peak Flow Rate (cfs)	106.3092
24-Hr Clear Runoff Volume (ac-ft)	22.5488
24-Hr Clear Runoff Volume (cu-ft)	982227.0738



Peak Flow Hydrologic Analysis

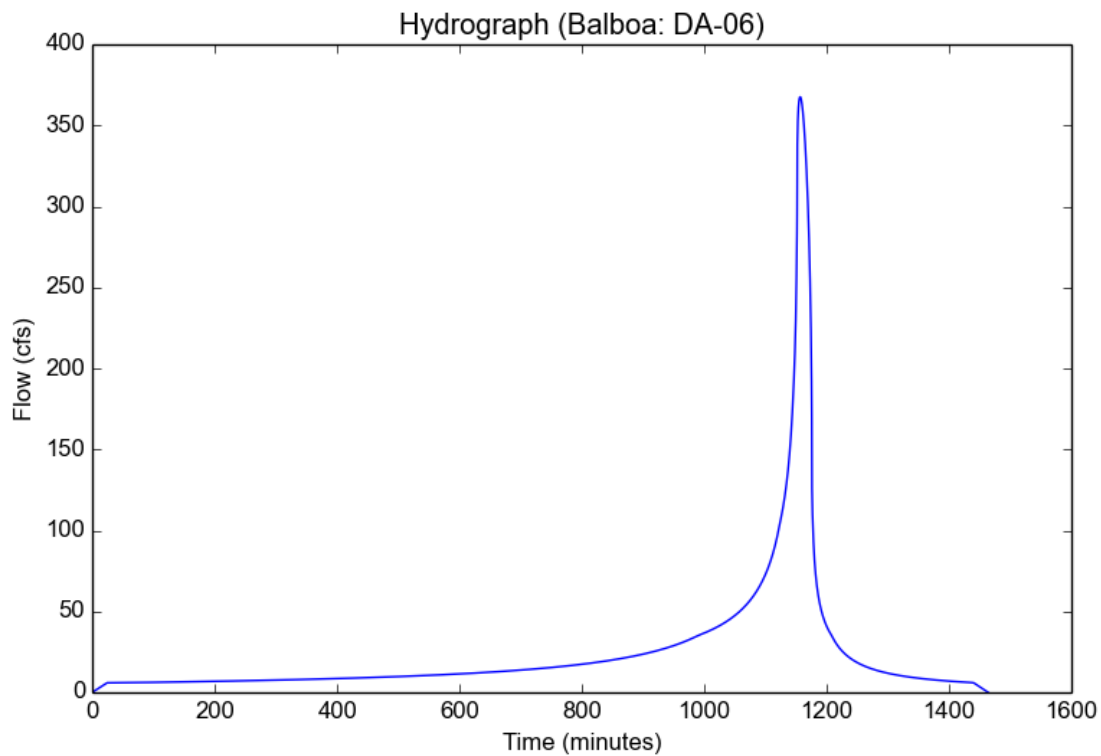
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.079
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	2.6539
Undeveloped Runoff Coefficient (Cu)	0.7793
Developed Runoff Coefficient (Cd)	0.7888
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	367.6041
Burned Peak Flow Rate (cfs)	367.6041
24-Hr Clear Runoff Volume (ac-ft)	50.079
24-Hr Clear Runoff Volume (cu-ft)	2181443.2219



Peak Flow Hydrologic Analysis

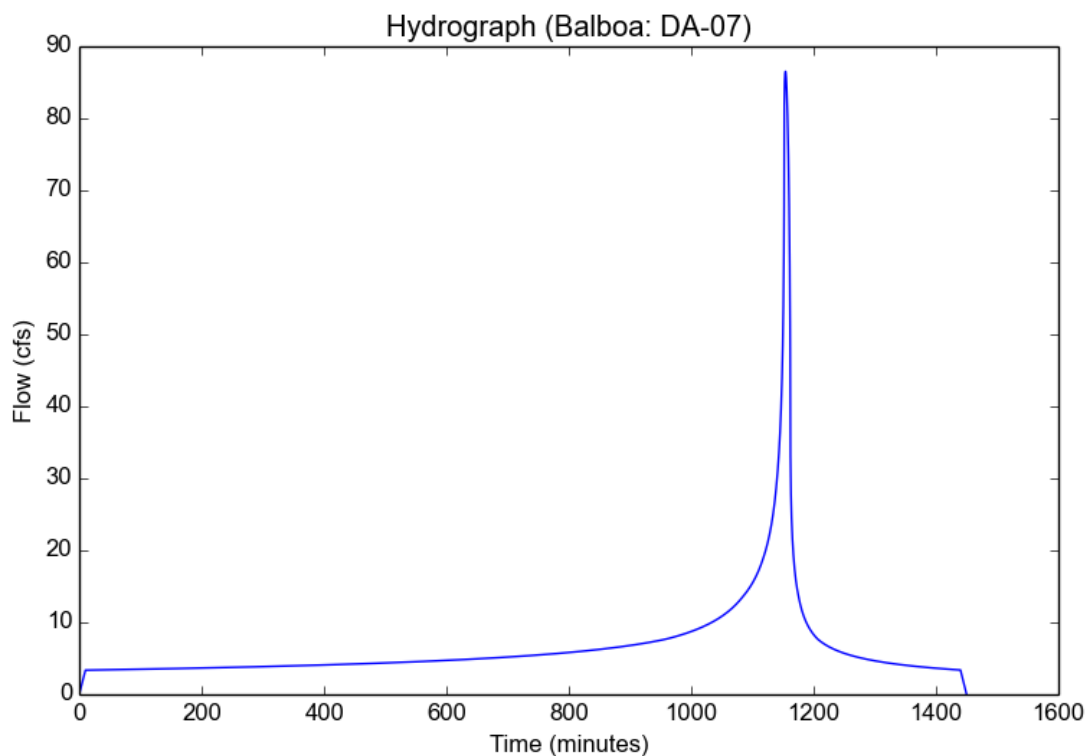
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.68
Soil Type	63
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	4.0049
Undeveloped Runoff Coefficient (Cu)	0.7474
Developed Runoff Coefficient (Cd)	0.8512
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	86.5171
Burned Peak Flow Rate (cfs)	86.5171
24-Hr Clear Runoff Volume (ac-ft)	13.2635
24-Hr Clear Runoff Volume (cu-ft)	577759.7708



Peak Flow Hydrologic Analysis

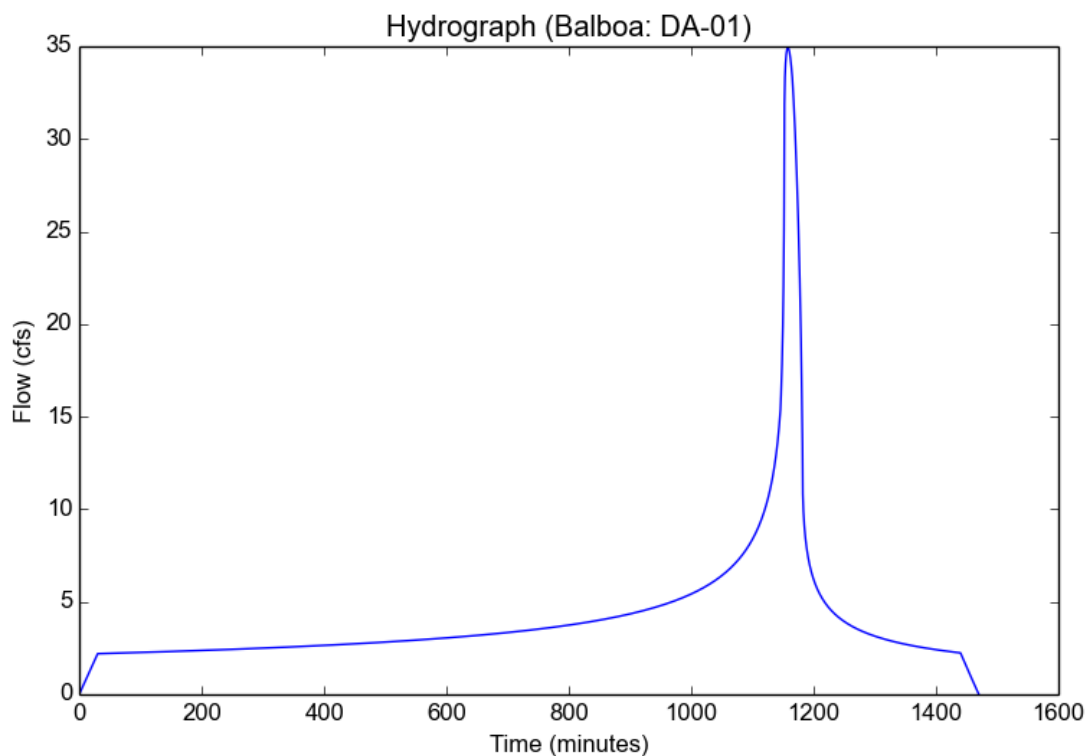
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.3466
Soil Type	63
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.3155
Developed Runoff Coefficient (Cd)	0.5181
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	34.9362
Burned Peak Flow Rate (cfs)	34.9362
24-Hr Clear Runoff Volume (ac-ft)	8.4737
24-Hr Clear Runoff Volume (cu-ft)	369114.2856



Peak Flow Hydrologic Analysis

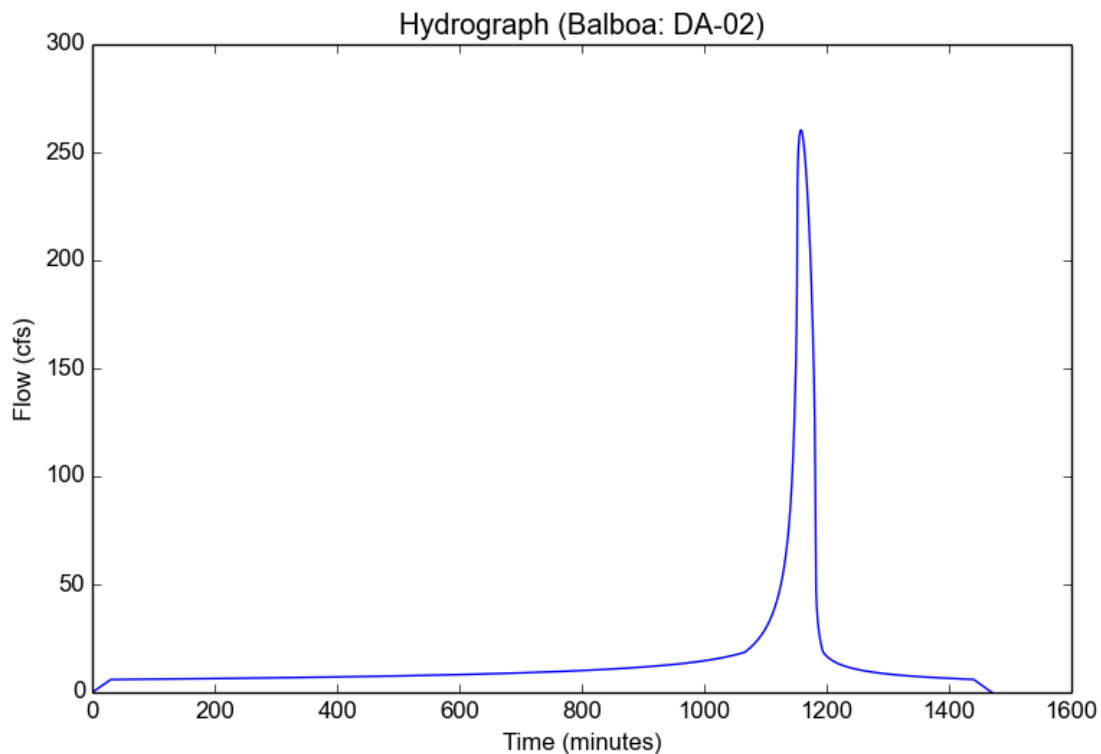
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Proposed Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.4882
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	260.3759
Burned Peak Flow Rate (cfs)	260.3759
24-Hr Clear Runoff Volume (ac-ft)	31.2495
24-Hr Clear Runoff Volume (cu-ft)	1361226.9276



Peak Flow Hydrologic Analysis

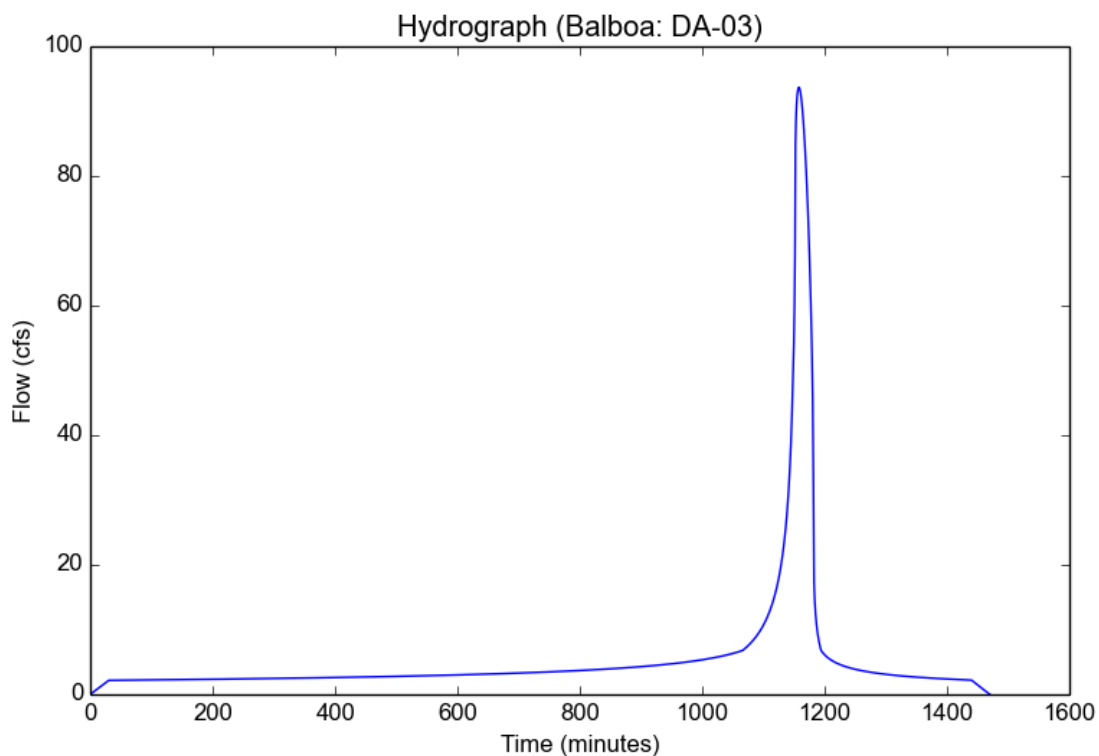
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0385
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.4893
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	93.6856
Burned Peak Flow Rate (cfs)	93.6856
24-Hr Clear Runoff Volume (ac-ft)	11.3339
24-Hr Clear Runoff Volume (cu-ft)	493705.0243



Peak Flow Hydrologic Analysis

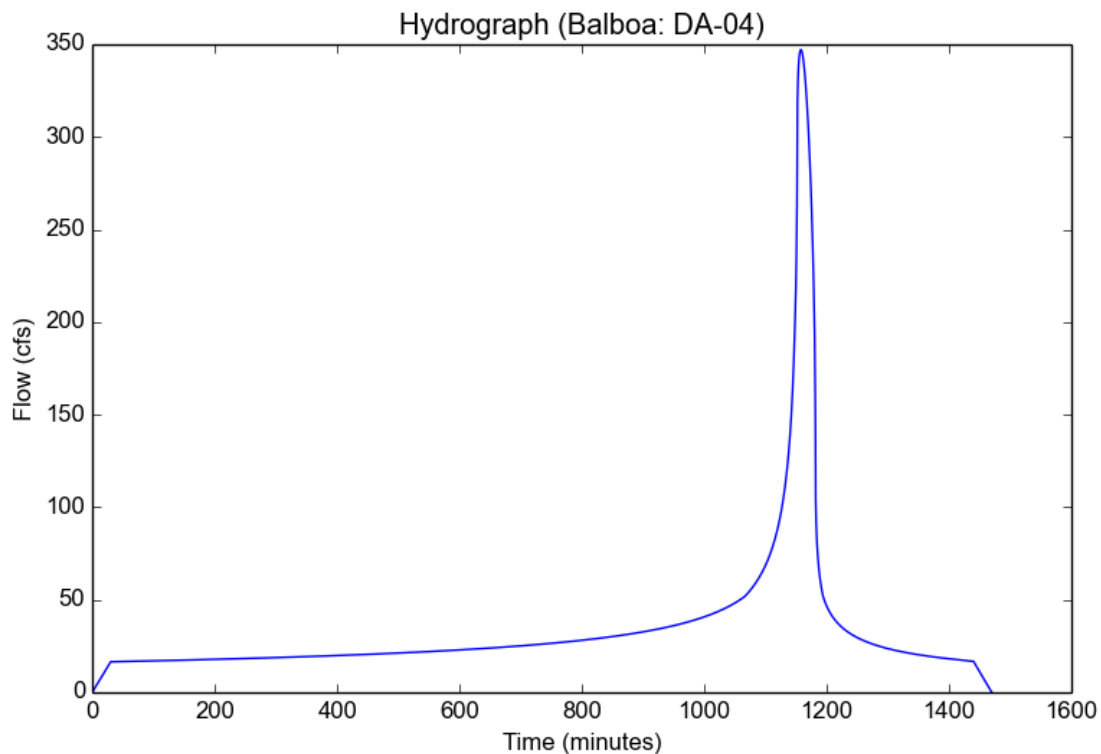
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.2843
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.5943
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	347.1406
Burned Peak Flow Rate (cfs)	347.1406
24-Hr Clear Runoff Volume (ac-ft)	68.953
24-Hr Clear Runoff Volume (cu-ft)	3003590.9922



Peak Flow Hydrologic Analysis

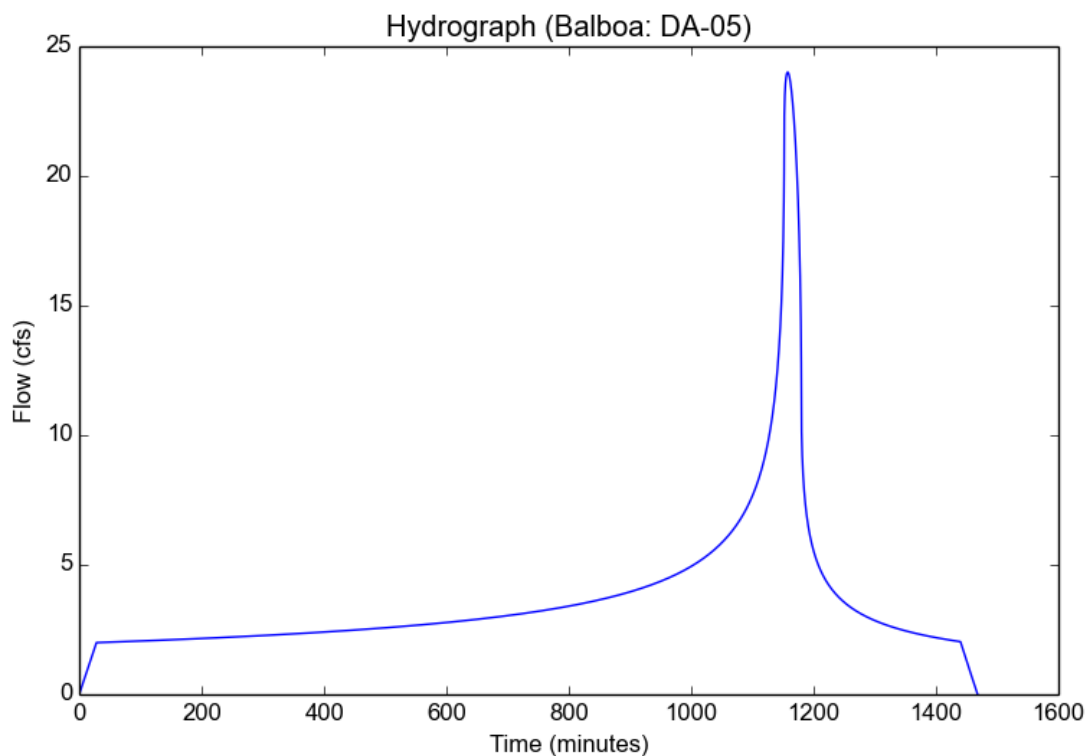
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.9871
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.8014
Undeveloped Runoff Coefficient (Cu)	0.4835
Developed Runoff Coefficient (Cd)	0.8946
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	24.0042
Burned Peak Flow Rate (cfs)	24.0042
24-Hr Clear Runoff Volume (ac-ft)	7.437
24-Hr Clear Runoff Volume (cu-ft)	323954.1788



Peak Flow Hydrologic Analysis

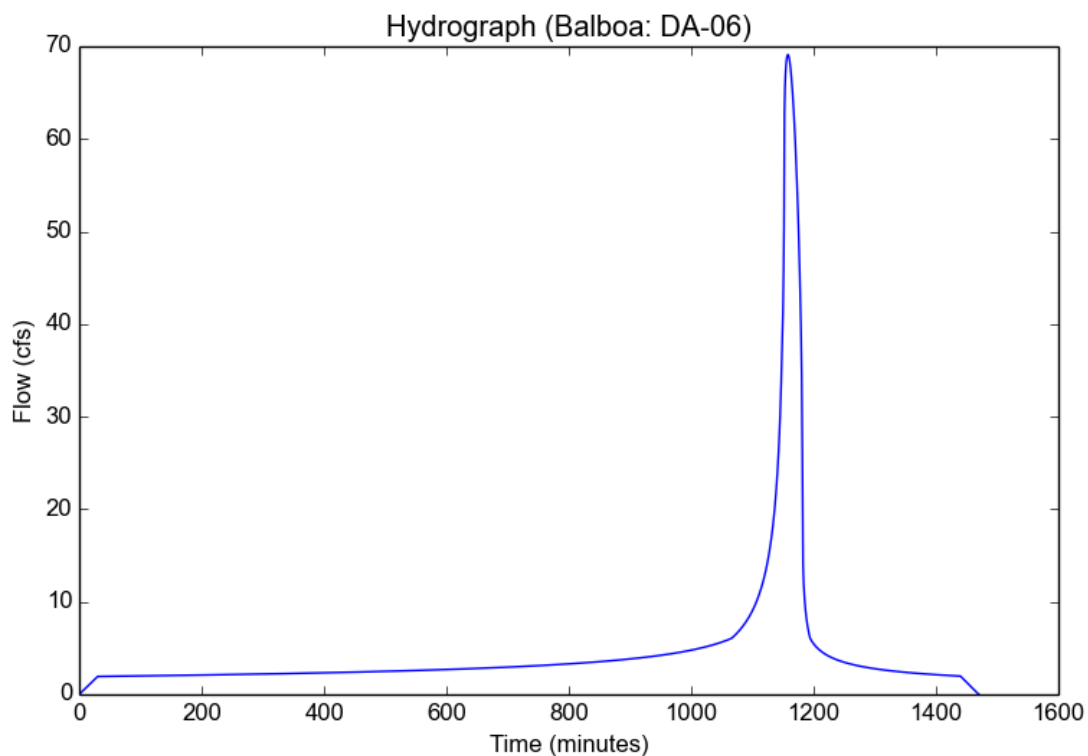
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0806
Soil Type	64
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.7758
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.5073
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	69.1042
Burned Peak Flow Rate (cfs)	69.1042
24-Hr Clear Runoff Volume (ac-ft)	9.4369
24-Hr Clear Runoff Volume (cu-ft)	411069.6286



Peak Flow Hydrologic Analysis

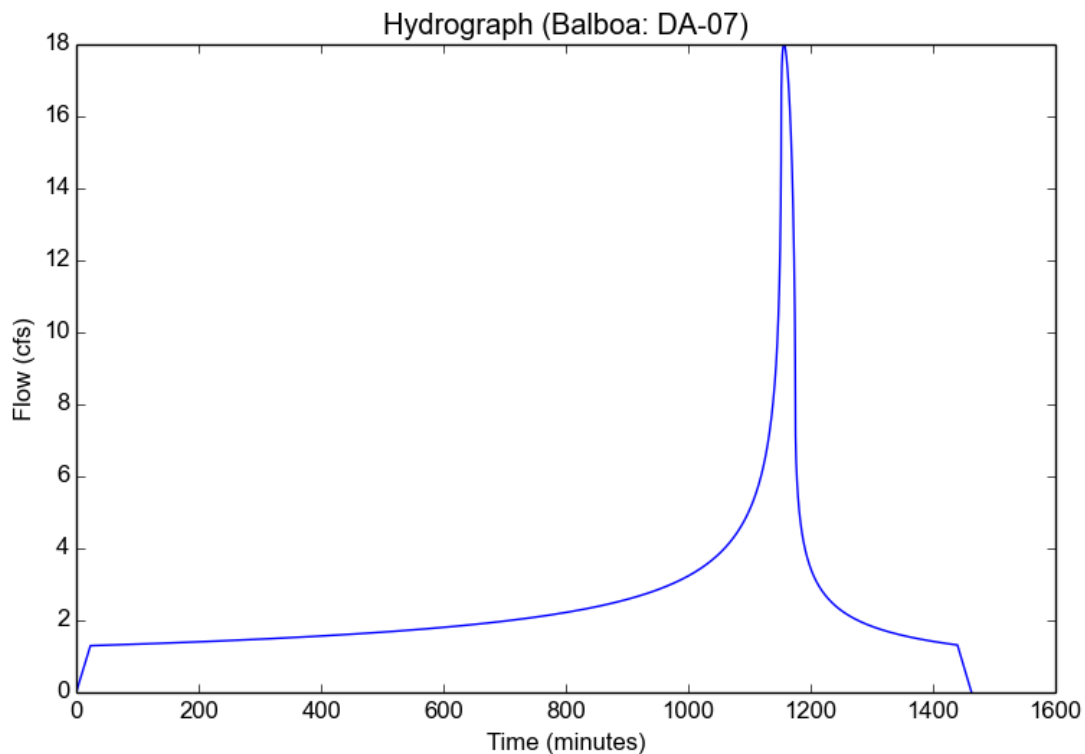
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.8288
Soil Type	63
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	3.0186
Peak Intensity (in/hr)	0.879
Undeveloped Runoff Coefficient (Cu)	0.3548
Developed Runoff Coefficient (Cd)	0.8067
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	17.9968
Burned Peak Flow Rate (cfs)	17.9968
24-Hr Clear Runoff Volume (ac-ft)	4.8569
24-Hr Clear Runoff Volume (cu-ft)	211565.635



Peak Flow Hydrologic Analysis

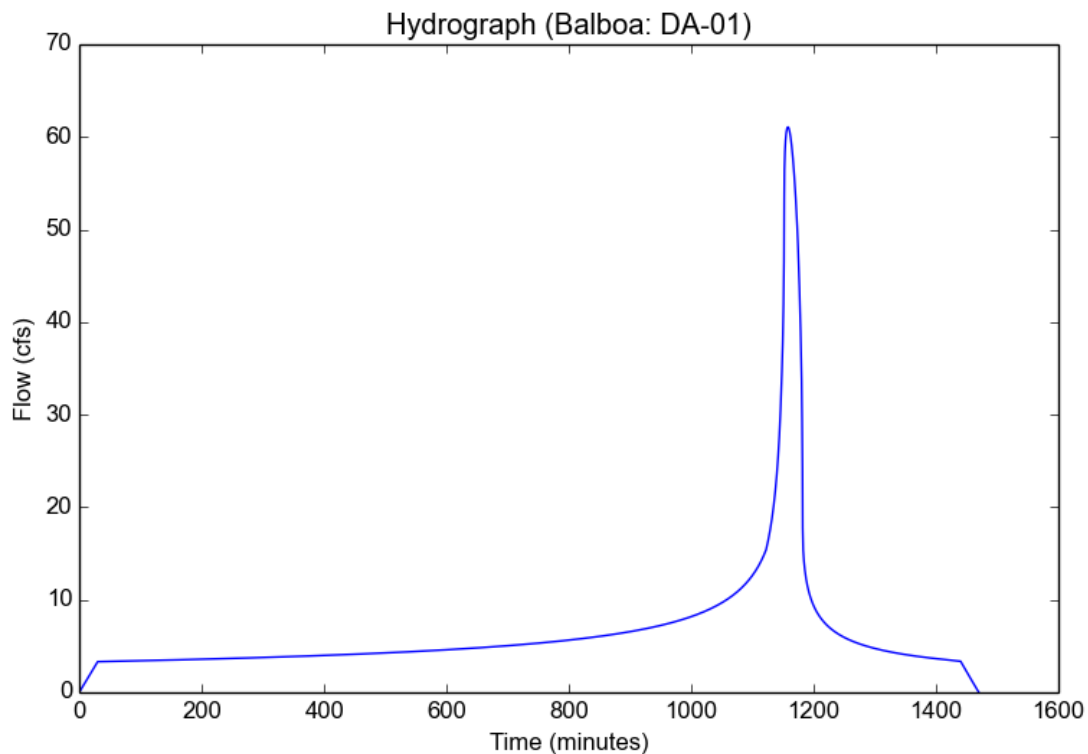
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.3466
Soil Type	63
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.4412
Developed Runoff Coefficient (Cd)	0.6002
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	61.0717
Burned Peak Flow Rate (cfs)	61.0717
24-Hr Clear Runoff Volume (ac-ft)	13.2761
24-Hr Clear Runoff Volume (cu-ft)	578306.1612



Peak Flow Hydrologic Analysis

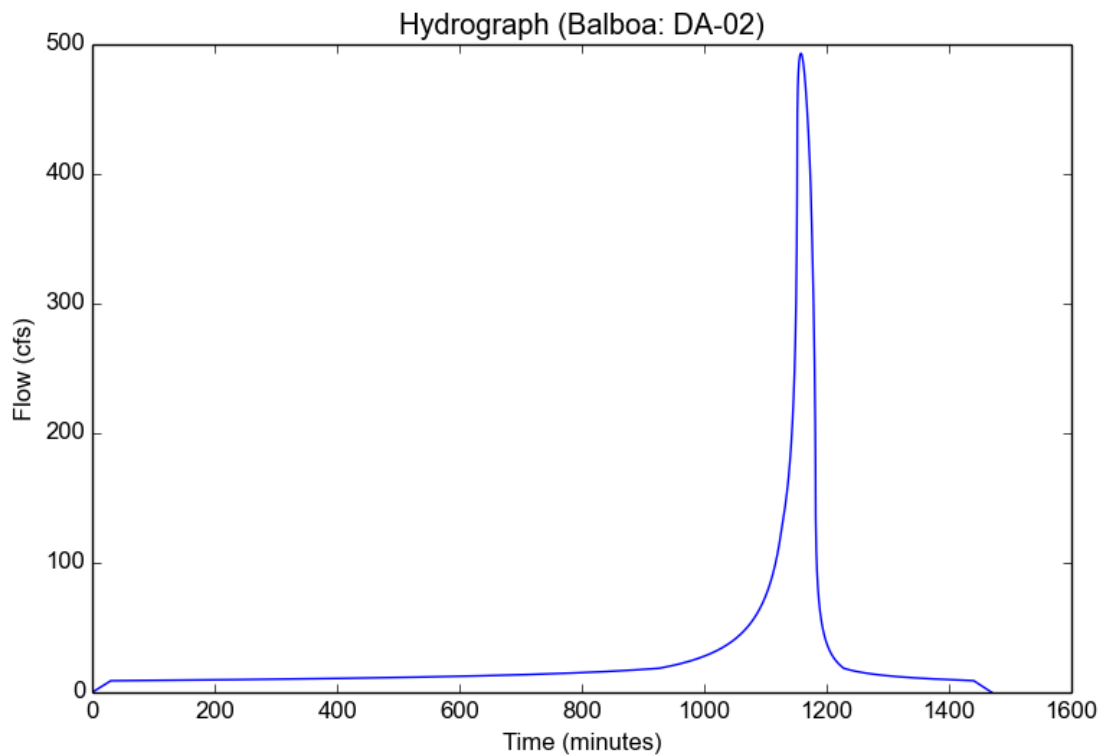
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.6019
Developed Runoff Coefficient (Cd)	0.6126
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	493.0533
Burned Peak Flow Rate (cfs)	493.0533
24-Hr Clear Runoff Volume (ac-ft)	57.425
24-Hr Clear Runoff Volume (cu-ft)	2501434.2997



Peak Flow Hydrologic Analysis

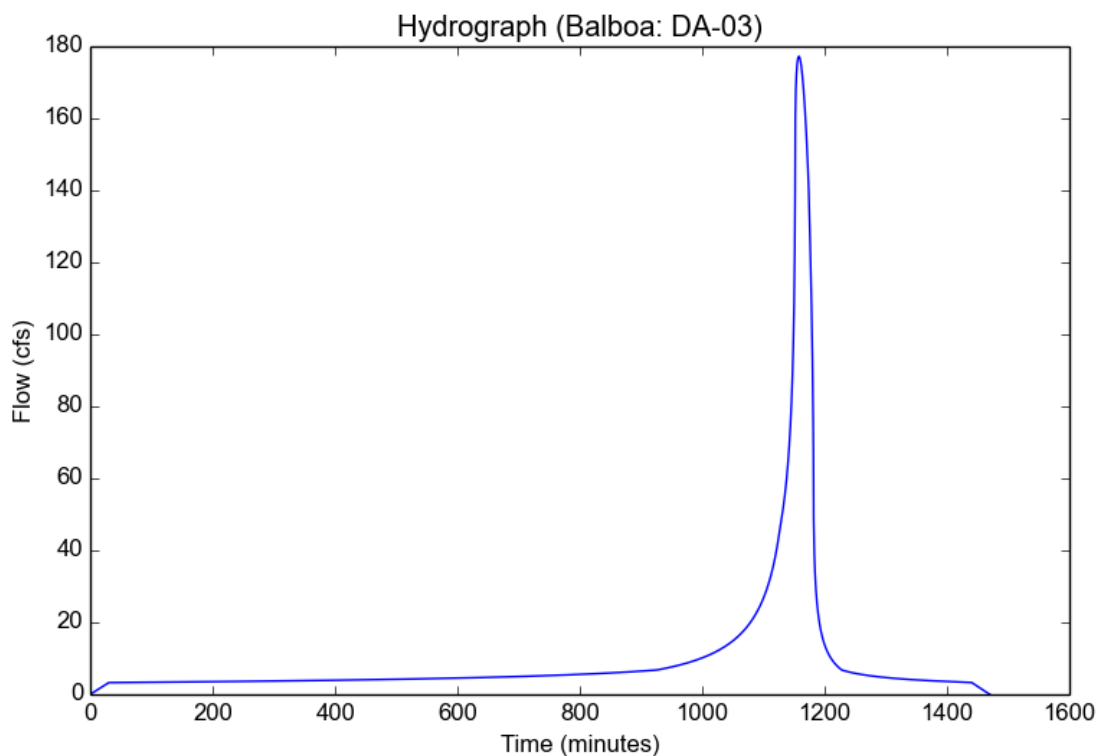
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0385
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.6019
Developed Runoff Coefficient (Cd)	0.6134
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	177.2331
Burned Peak Flow Rate (cfs)	177.2331
24-Hr Clear Runoff Volume (ac-ft)	20.7803
24-Hr Clear Runoff Volume (cu-ft)	905191.2898



Peak Flow Hydrologic Analysis

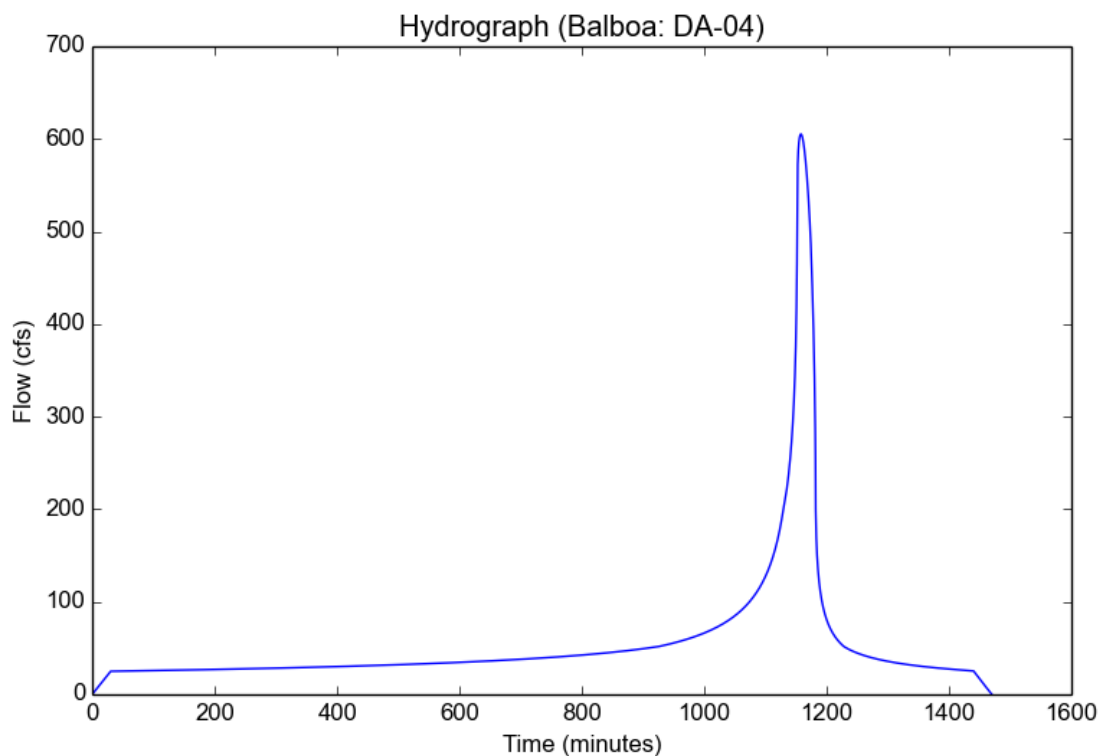
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.2843
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.6019
Developed Runoff Coefficient (Cd)	0.6866
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	605.2756
Burned Peak Flow Rate (cfs)	605.2756
24-Hr Clear Runoff Volume (ac-ft)	112.4027
24-Hr Clear Runoff Volume (cu-ft)	4896262.5099



Peak Flow Hydrologic Analysis

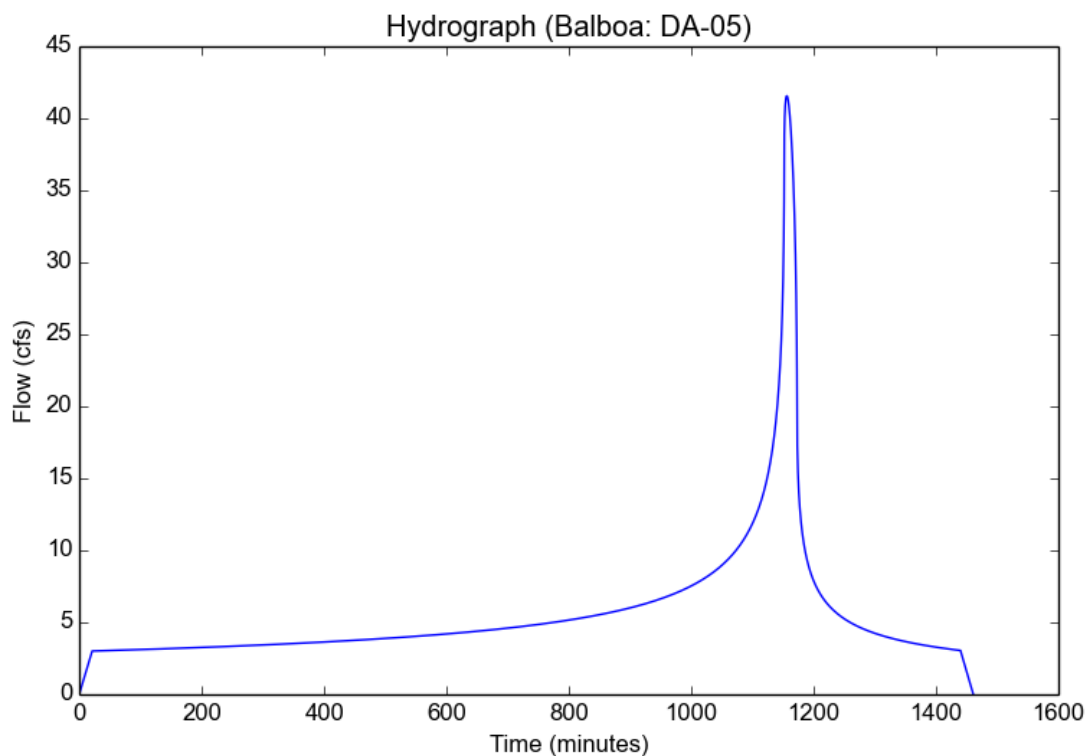
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.9871
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.3845
Undeveloped Runoff Coefficient (Cu)	0.6467
Developed Runoff Coefficient (Cd)	0.8967
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	41.5654
Burned Peak Flow Rate (cfs)	41.5654
24-Hr Clear Runoff Volume (ac-ft)	11.2295
24-Hr Clear Runoff Volume (cu-ft)	489158.5351



Peak Flow Hydrologic Analysis

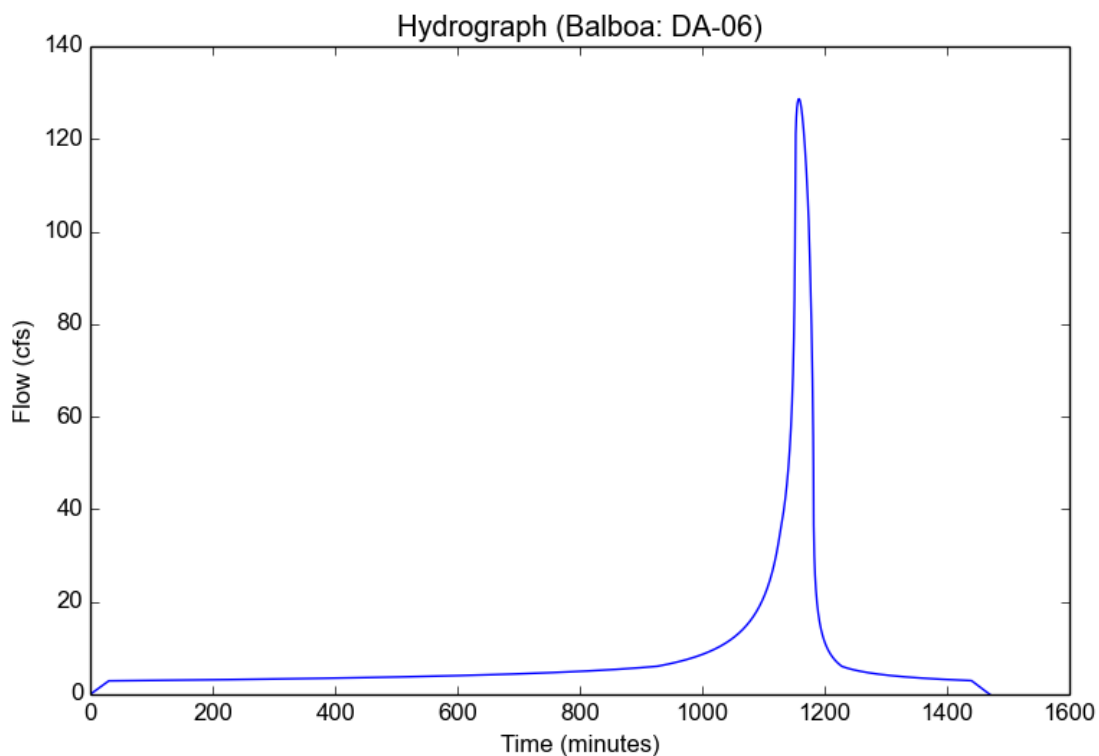
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0806
Soil Type	64
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.1708
Undeveloped Runoff Coefficient (Cu)	0.6019
Developed Runoff Coefficient (Cd)	0.6259
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	128.6756
Burned Peak Flow Rate (cfs)	128.6756
24-Hr Clear Runoff Volume (ac-ft)	16.7421
24-Hr Clear Runoff Volume (cu-ft)	729287.2568



Peak Flow Hydrologic Analysis

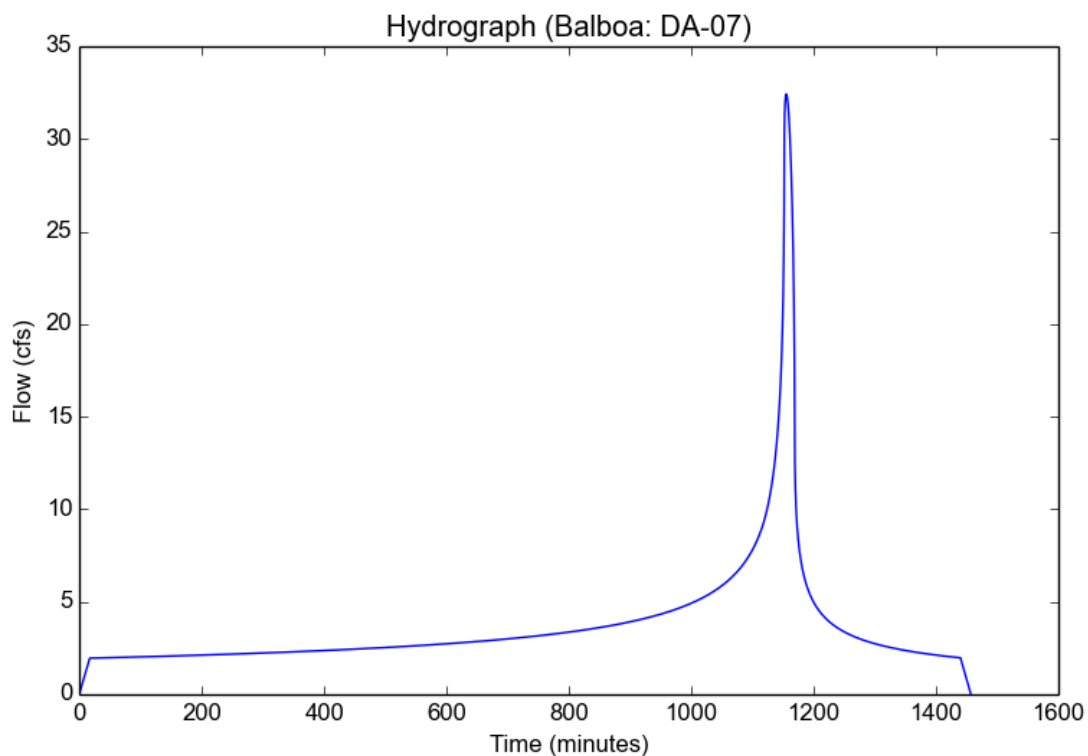
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.8288
Soil Type	63
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.5552
Peak Intensity (in/hr)	1.529
Undeveloped Runoff Coefficient (Cu)	0.5233
Developed Runoff Coefficient (Cd)	0.8355
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	32.4234
Burned Peak Flow Rate (cfs)	32.4234
24-Hr Clear Runoff Volume (ac-ft)	7.3668
24-Hr Clear Runoff Volume (cu-ft)	320897.6594



Peak Flow Hydrologic Analysis

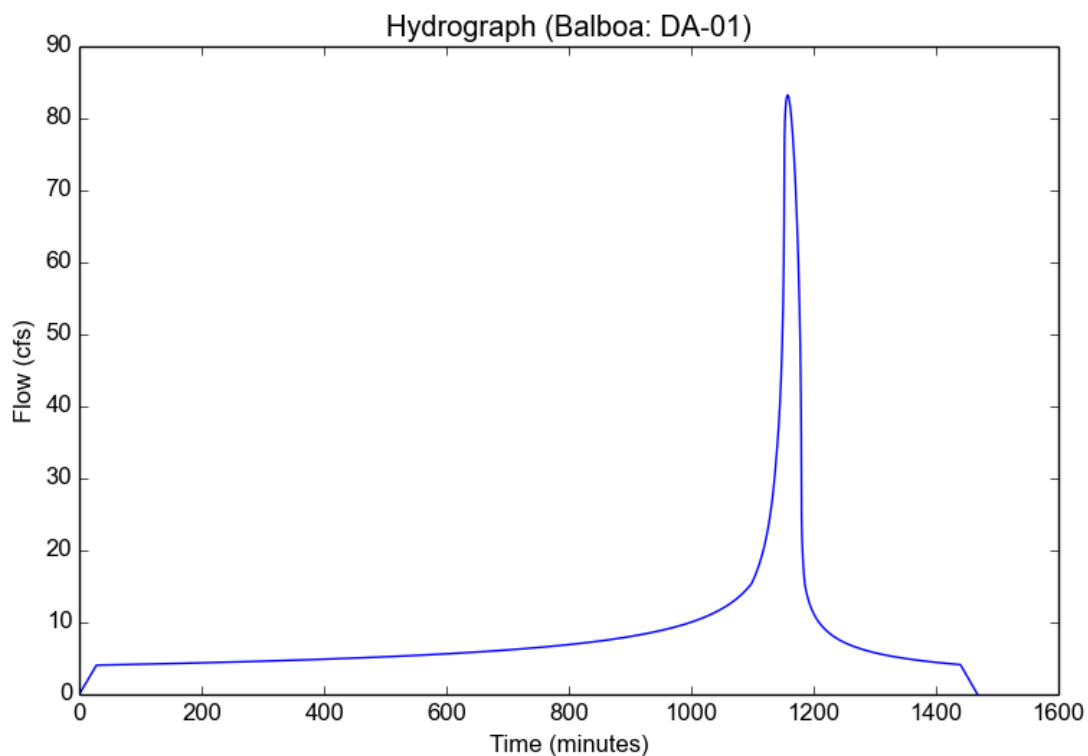
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.3466
Soil Type	63
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4786
Undeveloped Runoff Coefficient (Cu)	0.5139
Developed Runoff Coefficient (Cd)	0.6477
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	83.2321
Burned Peak Flow Rate (cfs)	83.2321
24-Hr Clear Runoff Volume (ac-ft)	16.6078
24-Hr Clear Runoff Volume (cu-ft)	723434.857



Peak Flow Hydrologic Analysis

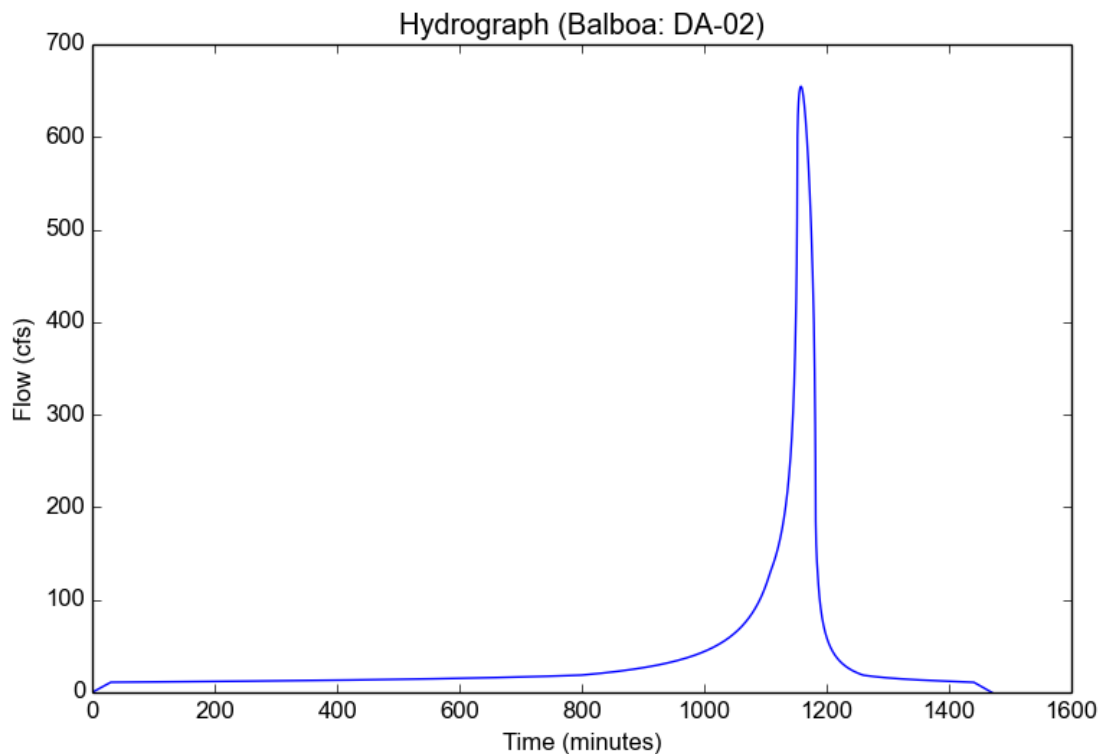
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4314
Undeveloped Runoff Coefficient (Cu)	0.6565
Developed Runoff Coefficient (Cd)	0.6653
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	654.6105
Burned Peak Flow Rate (cfs)	654.6105
24-Hr Clear Runoff Volume (ac-ft)	78.4532
24-Hr Clear Runoff Volume (cu-ft)	3417423.3087



Peak Flow Hydrologic Analysis

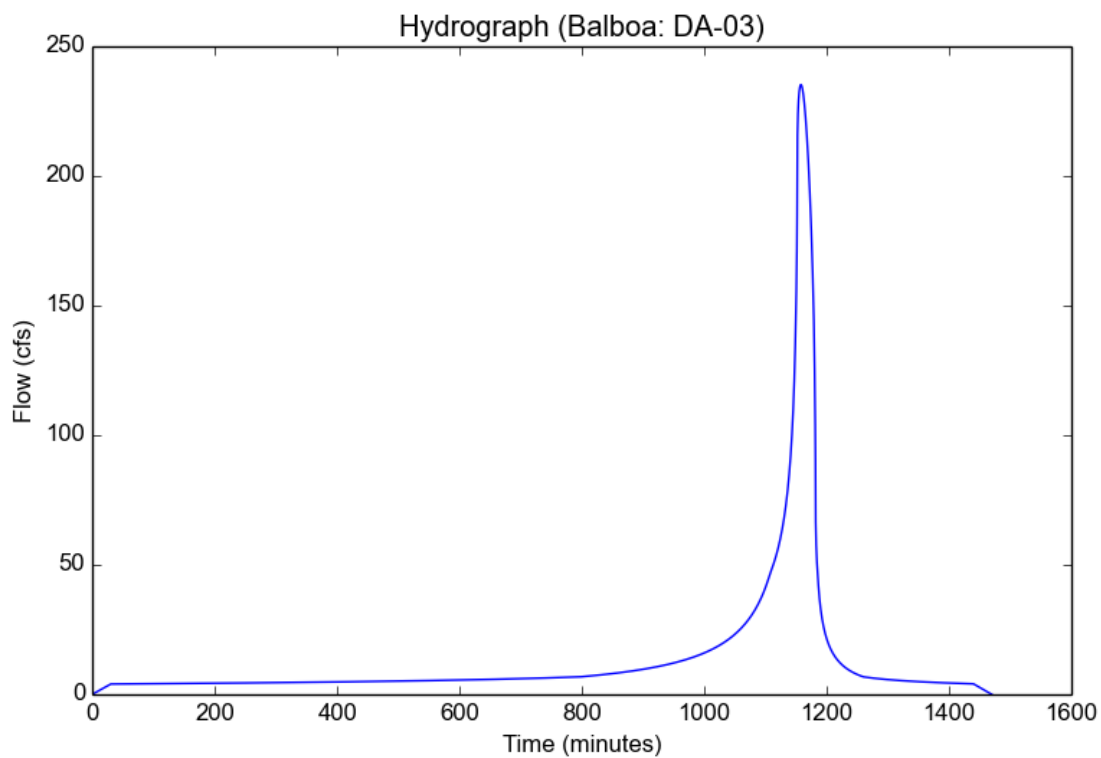
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0385
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4314
Undeveloped Runoff Coefficient (Cu)	0.6565
Developed Runoff Coefficient (Cd)	0.6659
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	235.2357
Burned Peak Flow Rate (cfs)	235.2357
24-Hr Clear Runoff Volume (ac-ft)	28.3587
24-Hr Clear Runoff Volume (cu-ft)	1235302.8911



Peak Flow Hydrologic Analysis

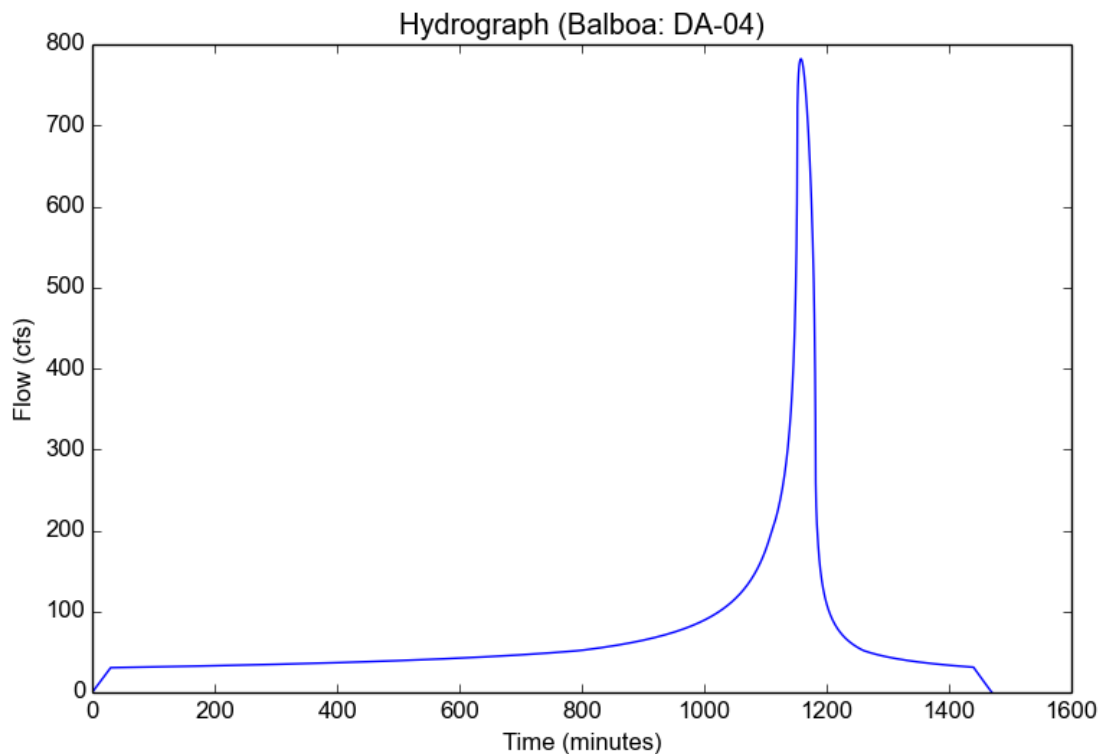
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.2843
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4314
Undeveloped Runoff Coefficient (Cu)	0.6565
Developed Runoff Coefficient (Cd)	0.7257
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	782.1349
Burned Peak Flow Rate (cfs)	782.1349
24-Hr Clear Runoff Volume (ac-ft)	144.1286
24-Hr Clear Runoff Volume (cu-ft)	6278240.0926



Peak Flow Hydrologic Analysis

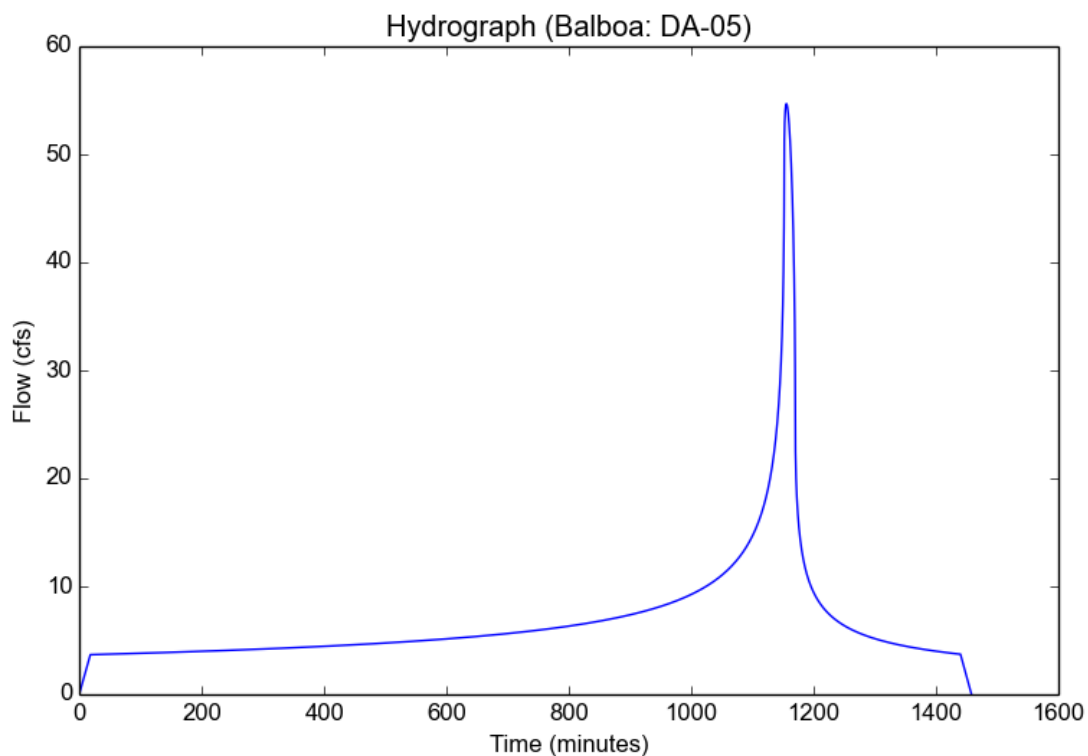
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.9871
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.8198
Undeveloped Runoff Coefficient (Cu)	0.7108
Developed Runoff Coefficient (Cd)	0.8976
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	54.6868
Burned Peak Flow Rate (cfs)	54.6868
24-Hr Clear Runoff Volume (ac-ft)	13.7347
24-Hr Clear Runoff Volume (cu-ft)	598281.6072



Peak Flow Hydrologic Analysis

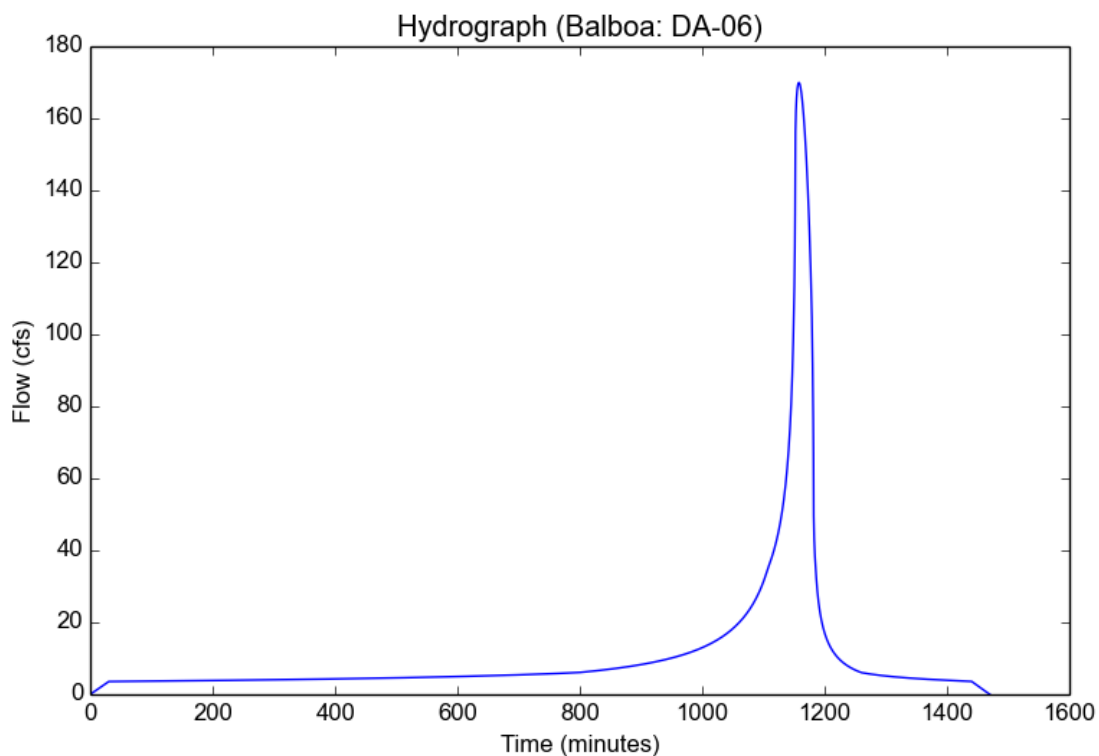
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0806
Soil Type	64
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.4314
Undeveloped Runoff Coefficient (Cu)	0.6565
Developed Runoff Coefficient (Cd)	0.6761
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	169.9389
Burned Peak Flow Rate (cfs)	169.9389
24-Hr Clear Runoff Volume (ac-ft)	22.4776
24-Hr Clear Runoff Volume (cu-ft)	979126.2761



Peak Flow Hydrologic Analysis

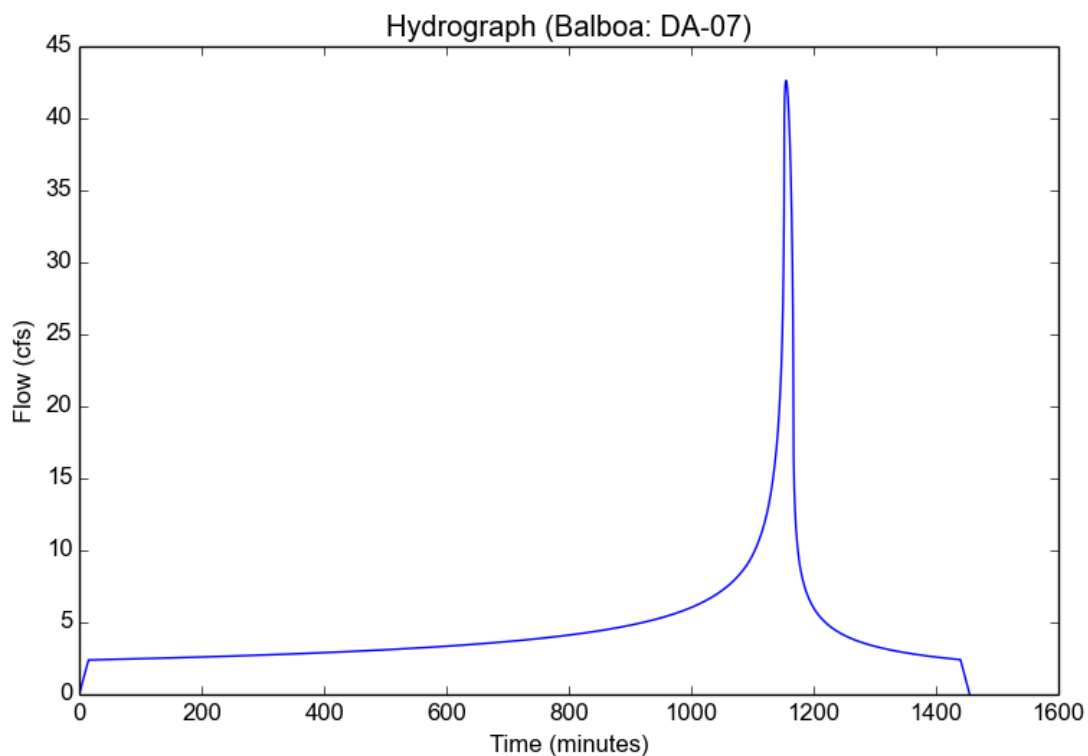
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.8288
Soil Type	63
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.5692
Peak Intensity (in/hr)	1.9827
Undeveloped Runoff Coefficient (Cu)	0.5918
Developed Runoff Coefficient (Cd)	0.8472
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	42.6327
Burned Peak Flow Rate (cfs)	42.6327
24-Hr Clear Runoff Volume (ac-ft)	9.0346
24-Hr Clear Runoff Volume (cu-ft)	393548.3644



Peak Flow Hydrologic Analysis

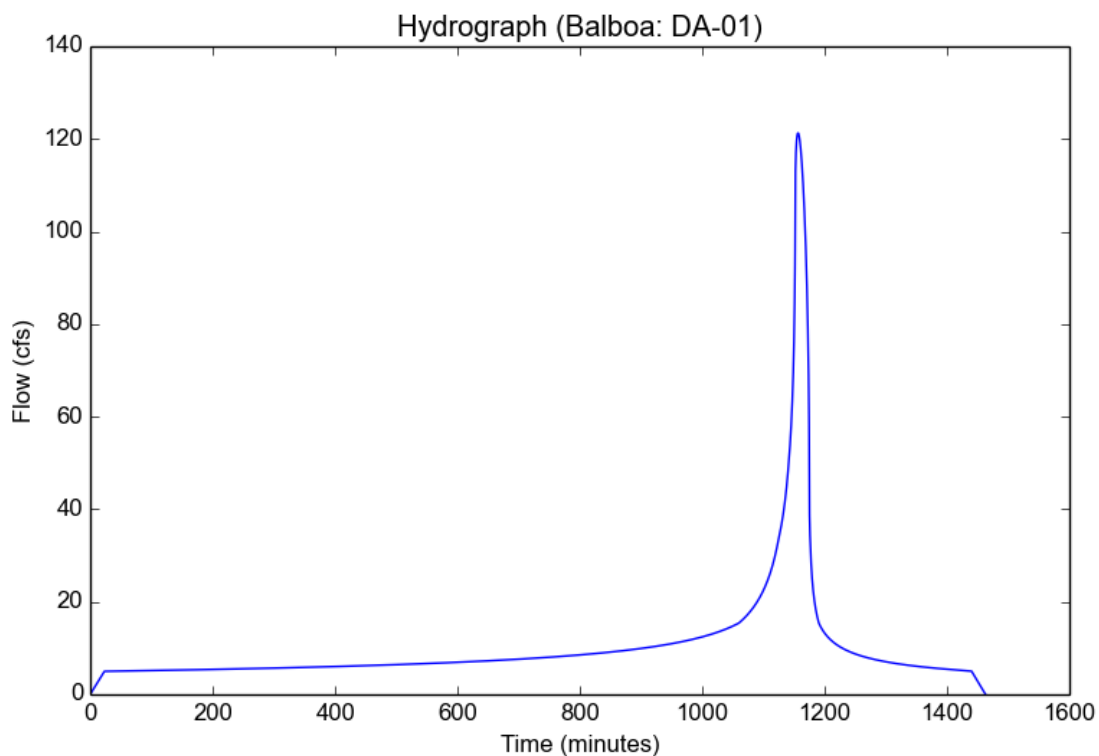
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Proposed Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.3466
Soil Type	63
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.9943
Undeveloped Runoff Coefficient (Cu)	0.5935
Developed Runoff Coefficient (Cd)	0.6998
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	121.2861
Burned Peak Flow Rate (cfs)	121.2861
24-Hr Clear Runoff Volume (ac-ft)	21.0185
24-Hr Clear Runoff Volume (cu-ft)	915565.6751



Peak Flow Hydrologic Analysis

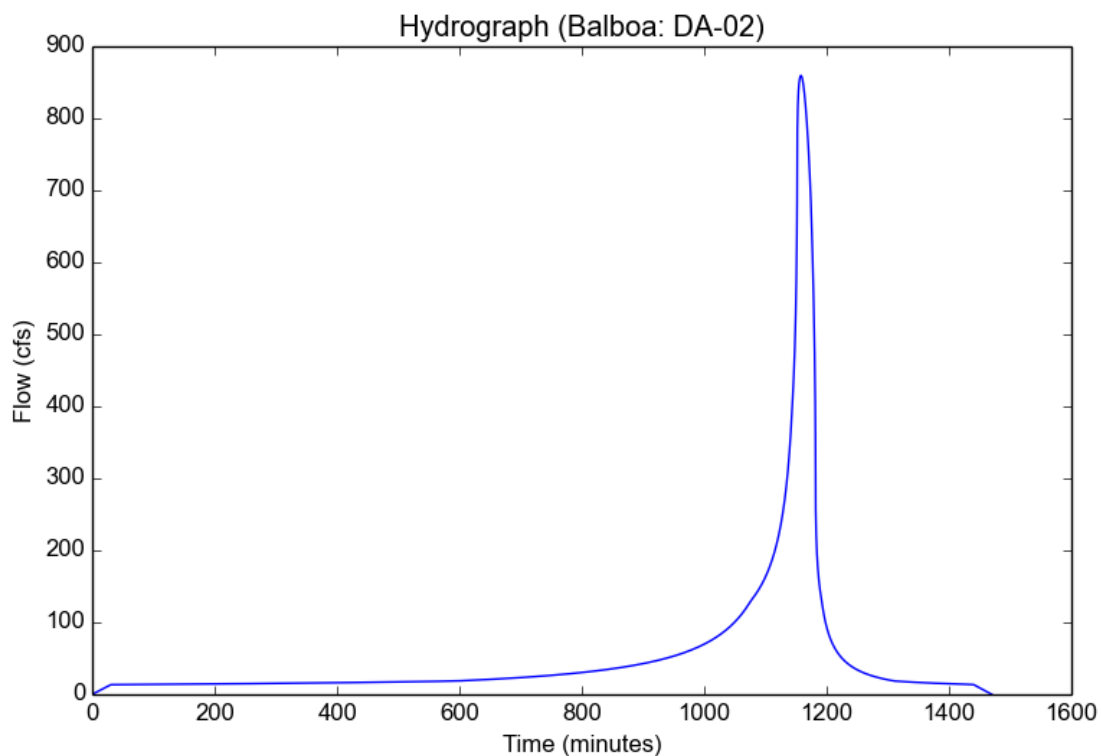
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.7602
Undeveloped Runoff Coefficient (Cu)	0.7033
Developed Runoff Coefficient (Cd)	0.7104
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	859.5754
Burned Peak Flow Rate (cfs)	859.5754
24-Hr Clear Runoff Volume (ac-ft)	109.4329
24-Hr Clear Runoff Volume (cu-ft)	4766899.1768



Peak Flow Hydrologic Analysis

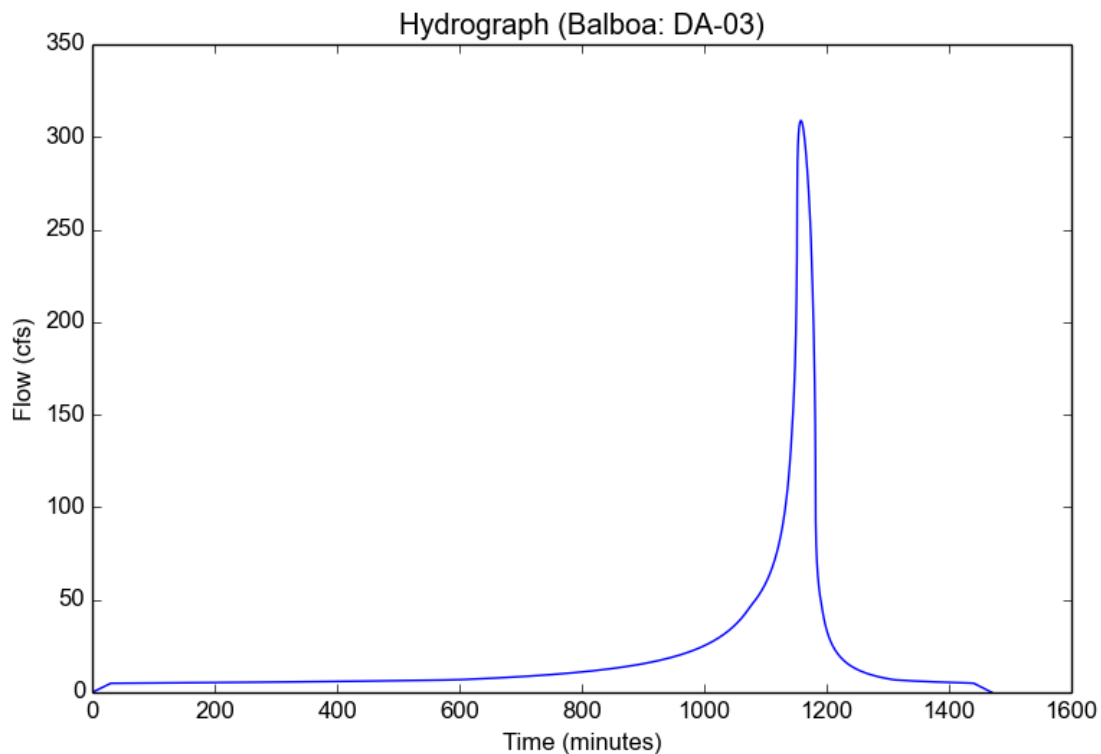
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Proposed Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0385
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.7602
Undeveloped Runoff Coefficient (Cu)	0.7033
Developed Runoff Coefficient (Cd)	0.7109
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	308.8215
Burned Peak Flow Rate (cfs)	308.8215
24-Hr Clear Runoff Volume (ac-ft)	39.5132
24-Hr Clear Runoff Volume (cu-ft)	1721192.8538



Peak Flow Hydrologic Analysis

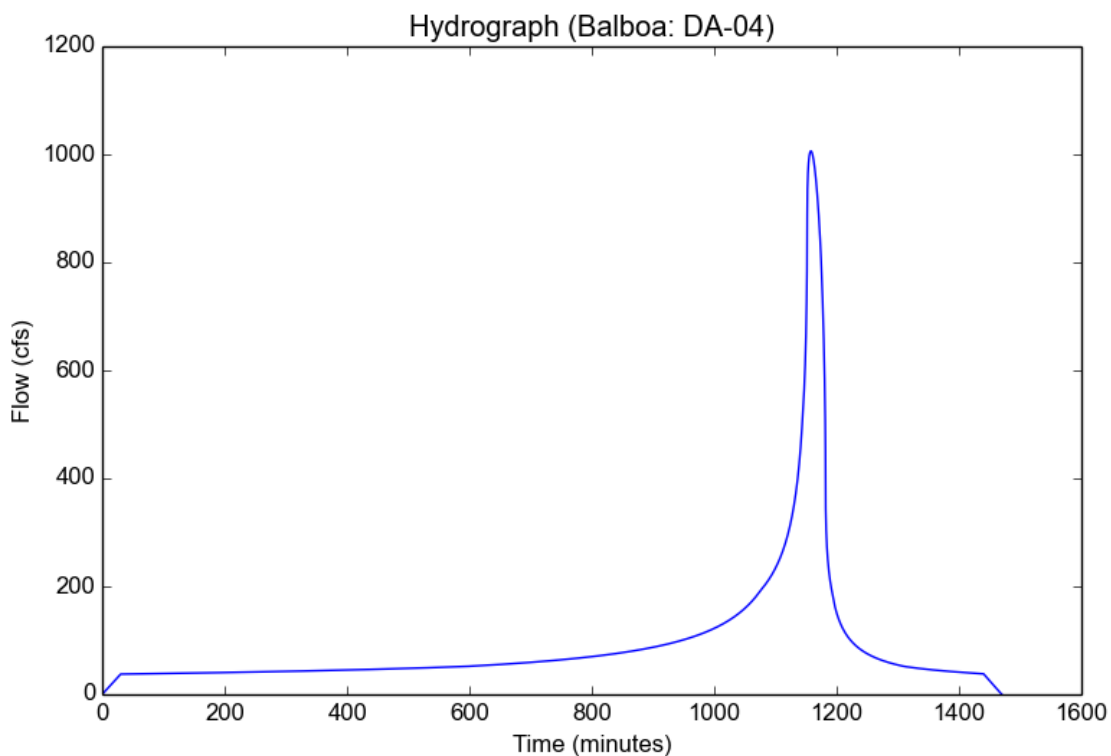
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.2843
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.7602
Undeveloped Runoff Coefficient (Cu)	0.7033
Developed Runoff Coefficient (Cd)	0.7592
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1006.1884
Burned Peak Flow Rate (cfs)	1006.1884
24-Hr Clear Runoff Volume (ac-ft)	187.7719
24-Hr Clear Runoff Volume (cu-ft)	8179345.9548



Peak Flow Hydrologic Analysis

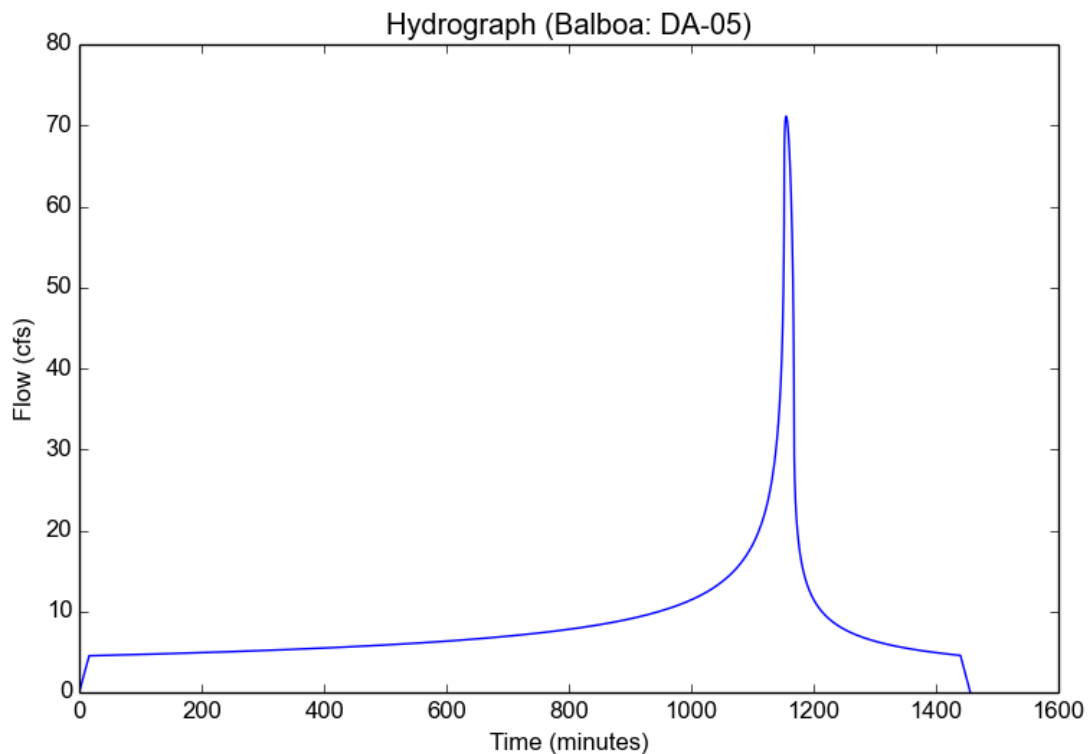
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.9871
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	2.3652
Undeveloped Runoff Coefficient (Cu)	0.759
Developed Runoff Coefficient (Cd)	0.8982
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	71.1248
Burned Peak Flow Rate (cfs)	71.1248
24-Hr Clear Runoff Volume (ac-ft)	16.8977
24-Hr Clear Runoff Volume (cu-ft)	736065.1916



Peak Flow Hydrologic Analysis

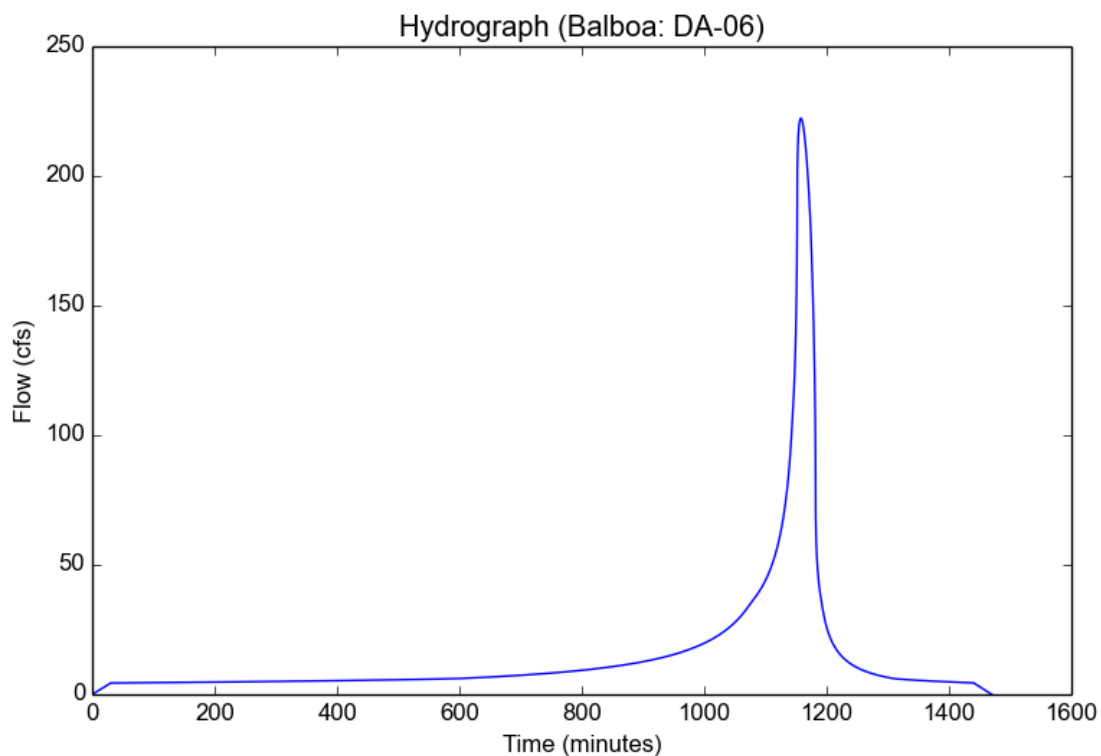
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0806
Soil Type	64
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	1.7602
Undeveloped Runoff Coefficient (Cu)	0.7033
Developed Runoff Coefficient (Cd)	0.7192
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	222.2755
Burned Peak Flow Rate (cfs)	222.2755
24-Hr Clear Runoff Volume (ac-ft)	30.7977
24-Hr Clear Runoff Volume (cu-ft)	1341549.8661



Peak Flow Hydrologic Analysis

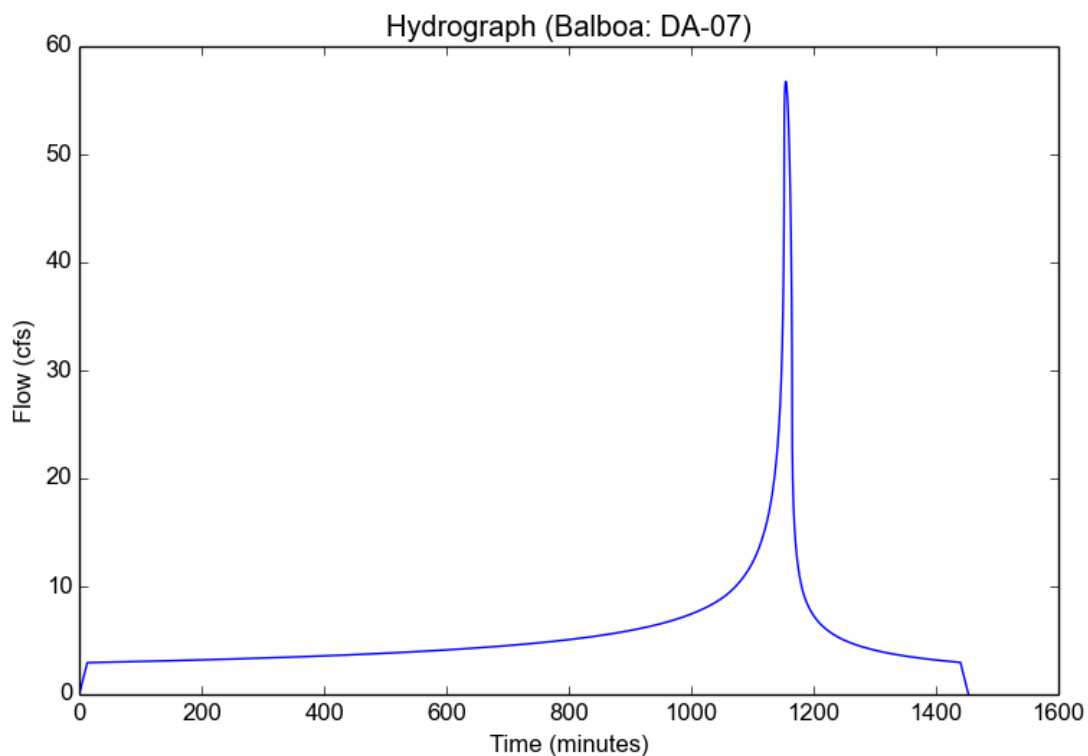
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.8288
Soil Type	63
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.8484
Peak Intensity (in/hr)	2.6077
Undeveloped Runoff Coefficient (Cu)	0.6519
Developed Runoff Coefficient (Cd)	0.8575
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	56.7536
Burned Peak Flow Rate (cfs)	56.7536
24-Hr Clear Runoff Volume (ac-ft)	11.1528
24-Hr Clear Runoff Volume (cu-ft)	485817.1895



Peak Flow Hydrologic Analysis

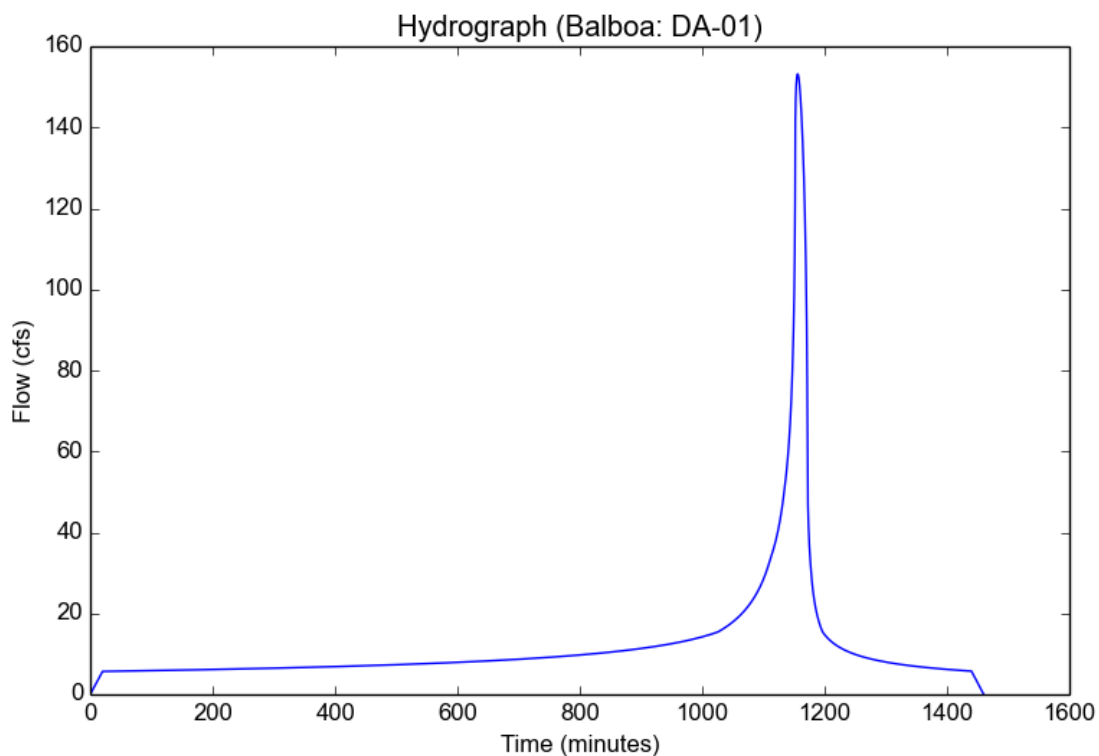
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.3466
Soil Type	63
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.4257
Undeveloped Runoff Coefficient (Cu)	0.6347
Developed Runoff Coefficient (Cd)	0.7266
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	153.1852
Burned Peak Flow Rate (cfs)	153.1852
24-Hr Clear Runoff Volume (ac-ft)	24.4299
24-Hr Clear Runoff Volume (cu-ft)	1064167.4104



Peak Flow Hydrologic Analysis

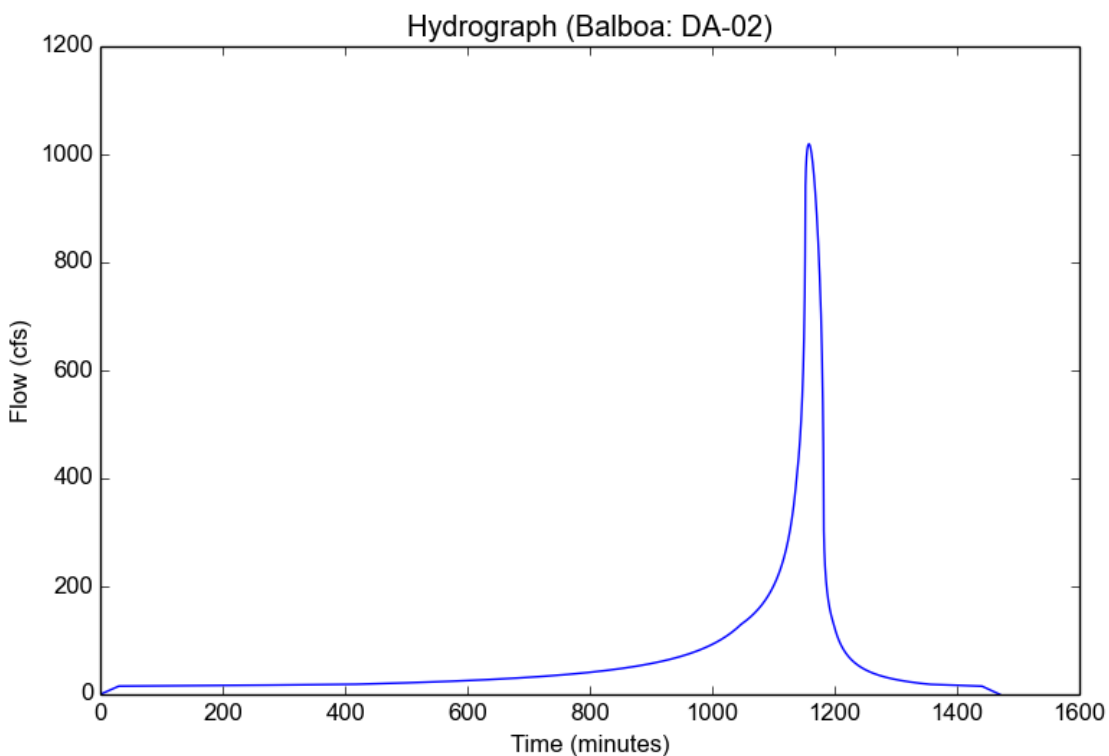
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.0048
Undeveloped Runoff Coefficient (Cu)	0.7336
Developed Runoff Coefficient (Cd)	0.7395
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1019.1852
Burned Peak Flow Rate (cfs)	1019.1852
24-Hr Clear Runoff Volume (ac-ft)	135.7862
24-Hr Clear Runoff Volume (cu-ft)	5914847.7419



Peak Flow Hydrologic Analysis

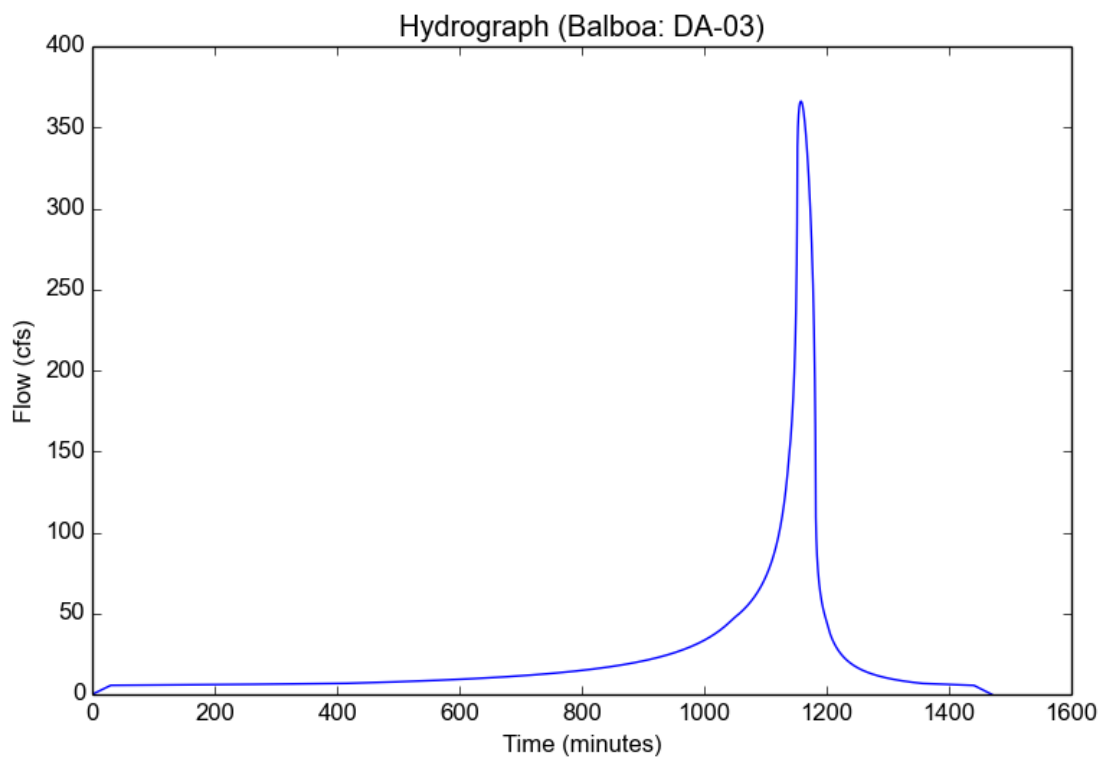
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0385
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.0048
Undeveloped Runoff Coefficient (Cu)	0.7336
Developed Runoff Coefficient (Cd)	0.74
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	366.1174
Burned Peak Flow Rate (cfs)	366.1174
24-Hr Clear Runoff Volume (ac-ft)	48.9954
24-Hr Clear Runoff Volume (cu-ft)	2134238.034



Peak Flow Hydrologic Analysis

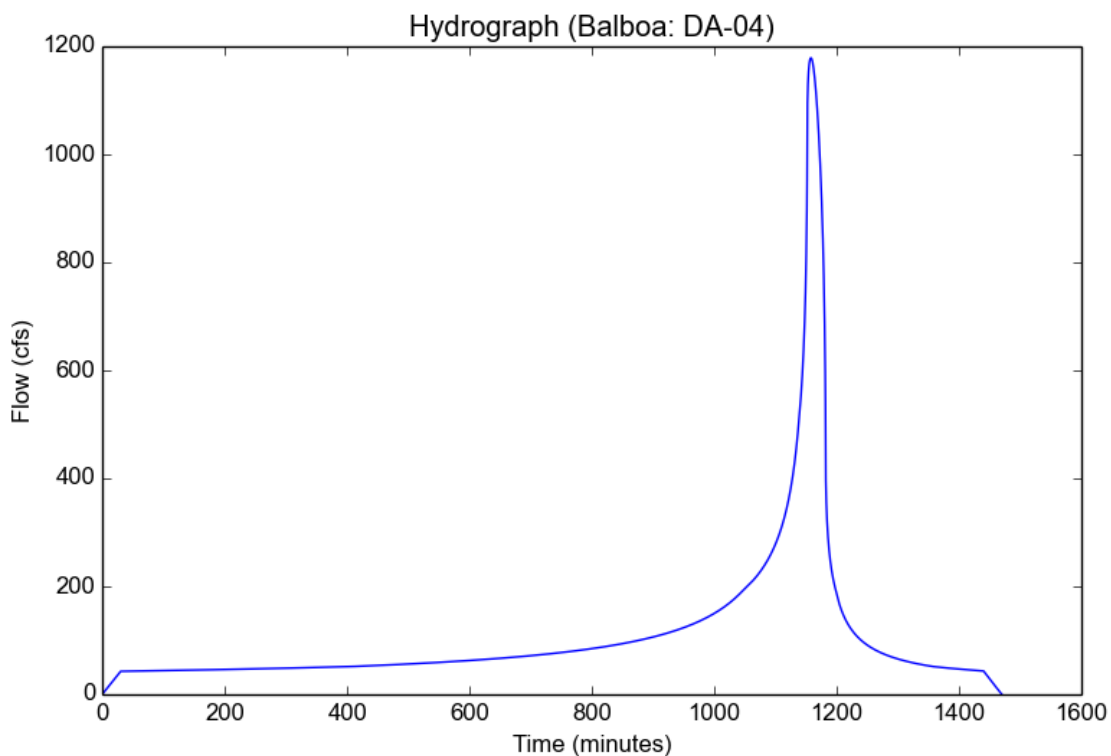
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.2843
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.0048
Undeveloped Runoff Coefficient (Cu)	0.7336
Developed Runoff Coefficient (Cd)	0.7809
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1178.665
Burned Peak Flow Rate (cfs)	1178.665
24-Hr Clear Runoff Volume (ac-ft)	222.9278
24-Hr Clear Runoff Volume (cu-ft)	9710735.0437



Peak Flow Hydrologic Analysis

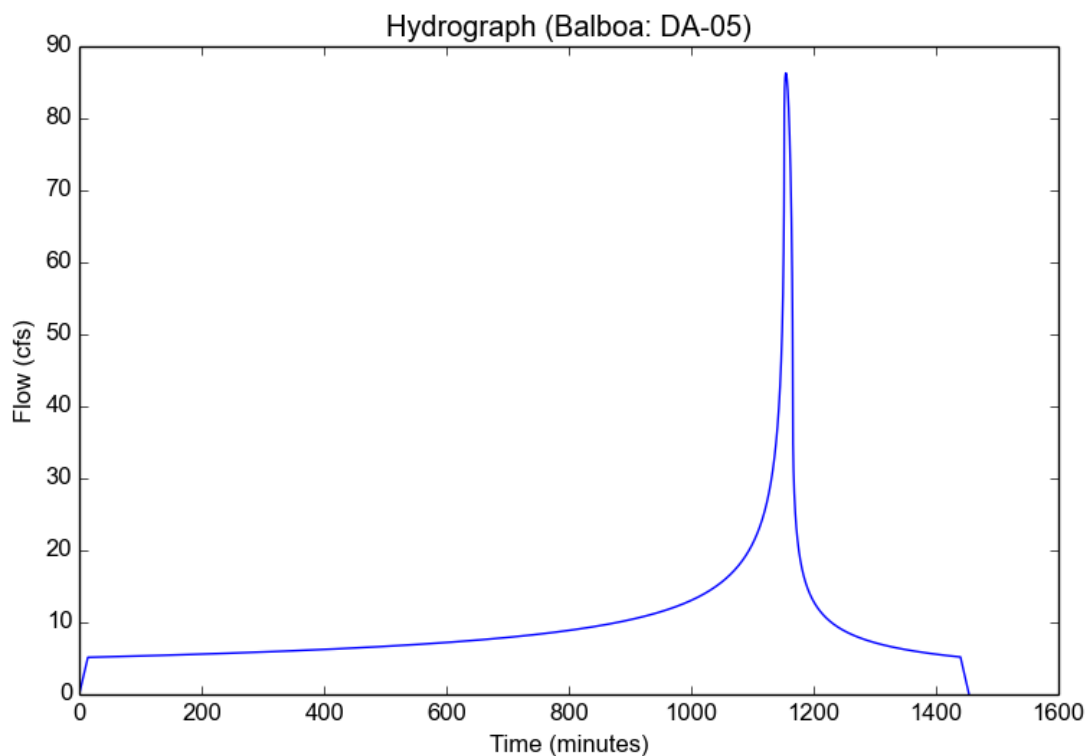
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.9871
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.8684
Undeveloped Runoff Coefficient (Cu)	0.7944
Developed Runoff Coefficient (Cd)	0.8986
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	86.2986
Burned Peak Flow Rate (cfs)	86.2986
24-Hr Clear Runoff Volume (ac-ft)	19.2529
24-Hr Clear Runoff Volume (cu-ft)	838656.9373



Peak Flow Hydrologic Analysis

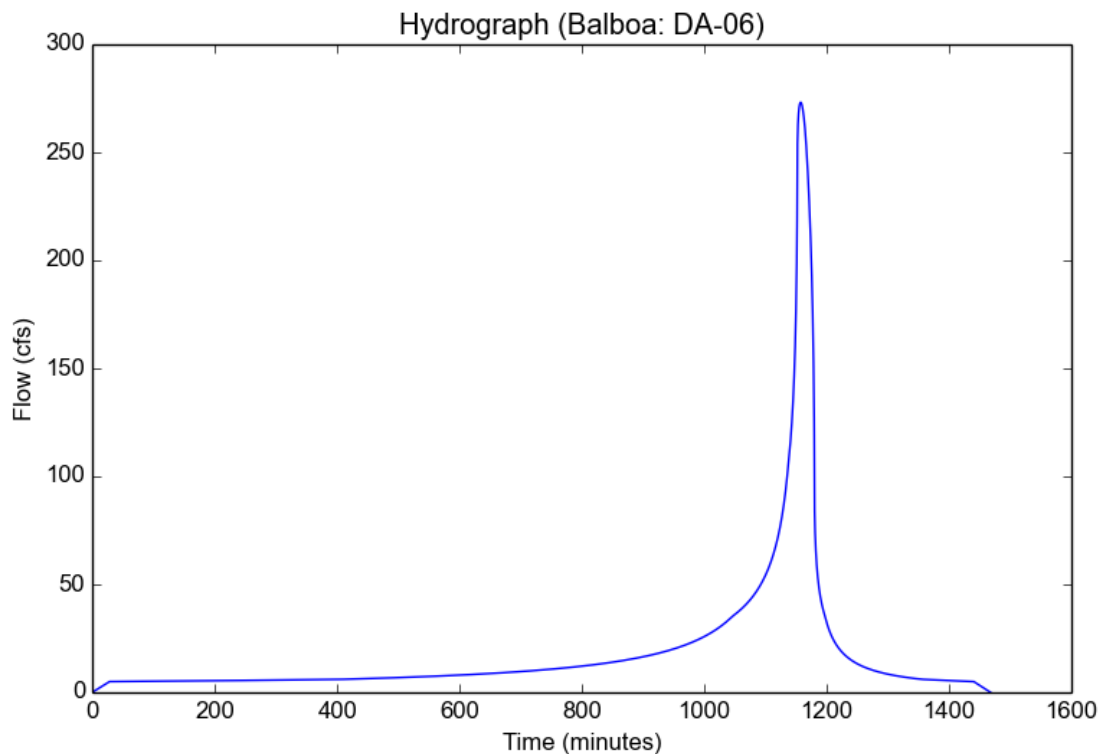
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0806
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	2.0709
Undeveloped Runoff Coefficient (Cu)	0.7382
Developed Runoff Coefficient (Cd)	0.7512
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	273.1703
Burned Peak Flow Rate (cfs)	273.1703
24-Hr Clear Runoff Volume (ac-ft)	37.8111
24-Hr Clear Runoff Volume (cu-ft)	1647052.6785



Peak Flow Hydrologic Analysis

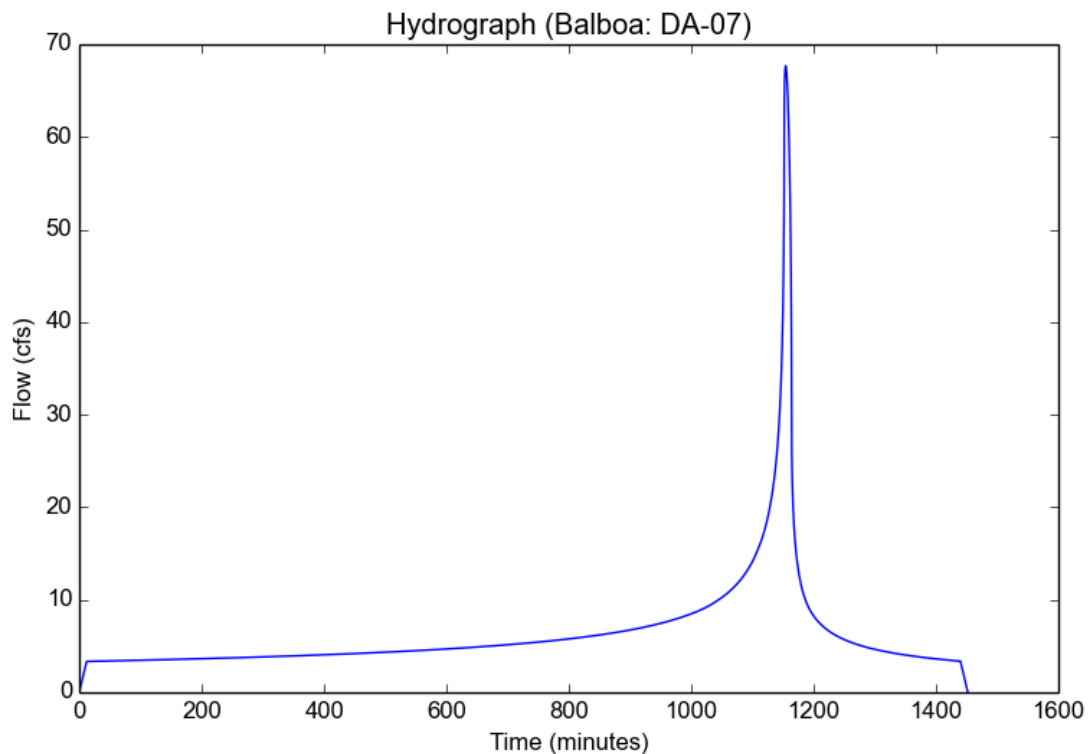
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.8288
Soil Type	63
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.8
Peak Intensity (in/hr)	3.0839
Undeveloped Runoff Coefficient (Cu)	0.6939
Developed Runoff Coefficient (Cd)	0.8647
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	67.6807
Burned Peak Flow Rate (cfs)	67.6807
24-Hr Clear Runoff Volume (ac-ft)	12.7403
24-Hr Clear Runoff Volume (cu-ft)	554968.3329



Peak Flow Hydrologic Analysis

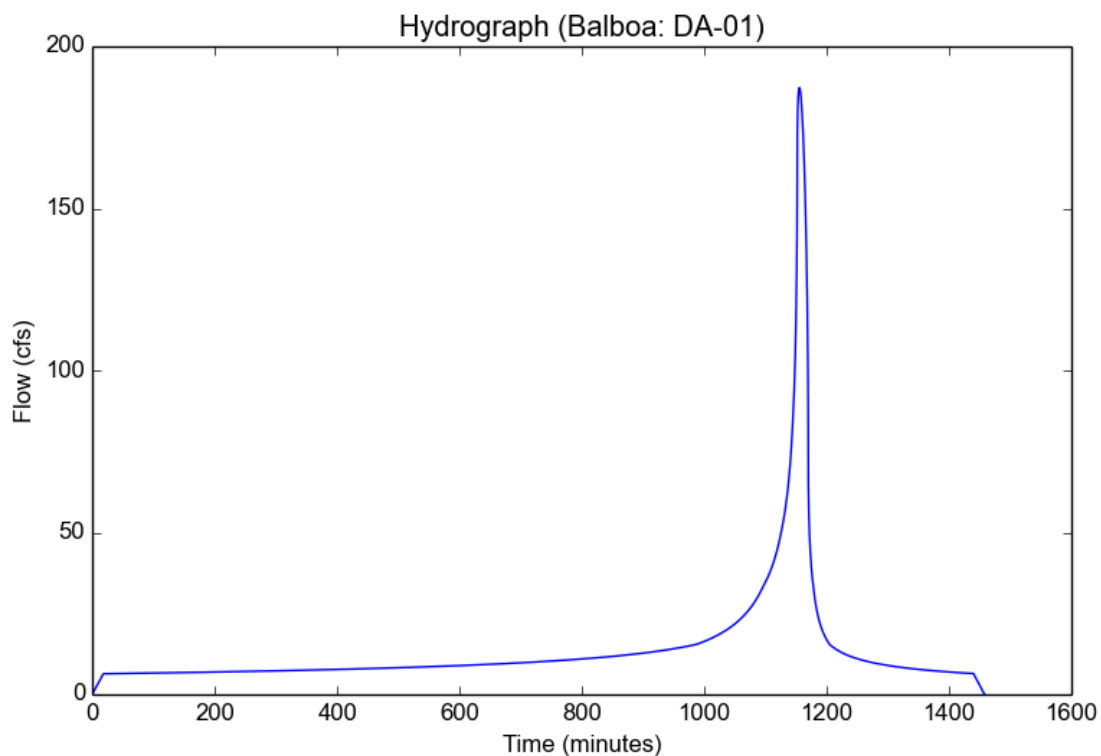
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.3466
Soil Type	63
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.8598
Undeveloped Runoff Coefficient (Cu)	0.6758
Developed Runoff Coefficient (Cd)	0.7535
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	187.2714
Burned Peak Flow Rate (cfs)	187.2714
24-Hr Clear Runoff Volume (ac-ft)	27.9736
24-Hr Clear Runoff Volume (cu-ft)	1218529.0631



Peak Flow Hydrologic Analysis

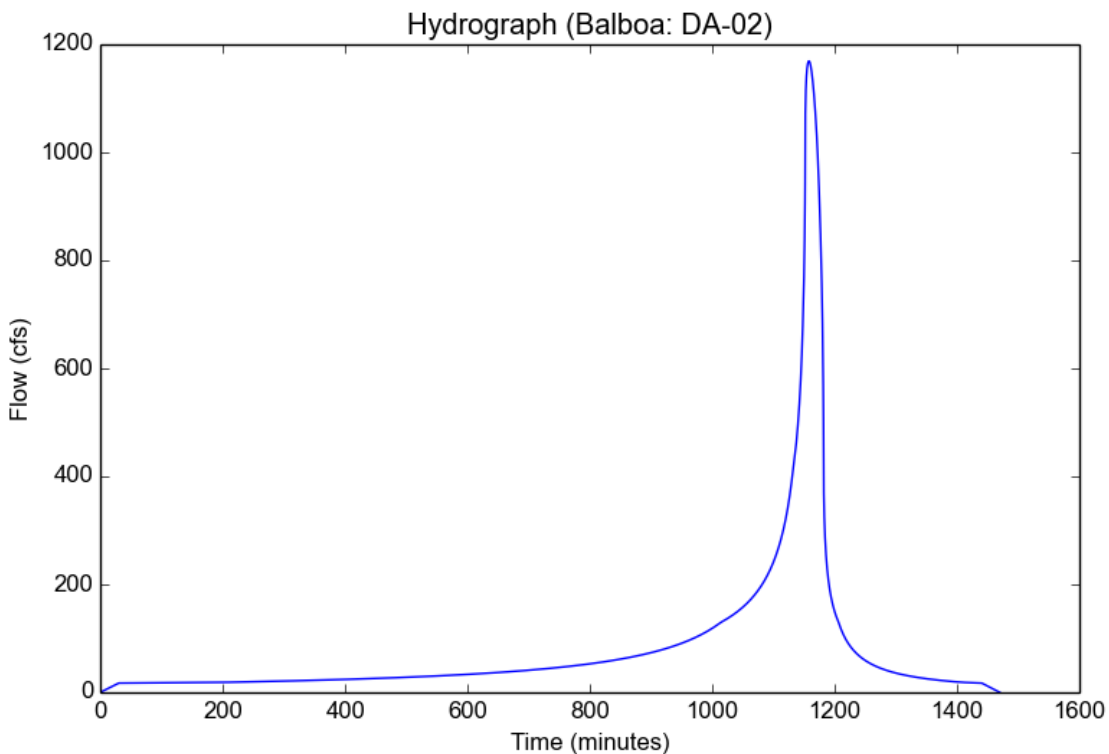
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.2494
Undeveloped Runoff Coefficient (Cu)	0.7508
Developed Runoff Coefficient (Cd)	0.7562
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1169.2221
Burned Peak Flow Rate (cfs)	1169.2221
24-Hr Clear Runoff Volume (ac-ft)	164.8343
24-Hr Clear Runoff Volume (cu-ft)	7180183.0335



Peak Flow Hydrologic Analysis

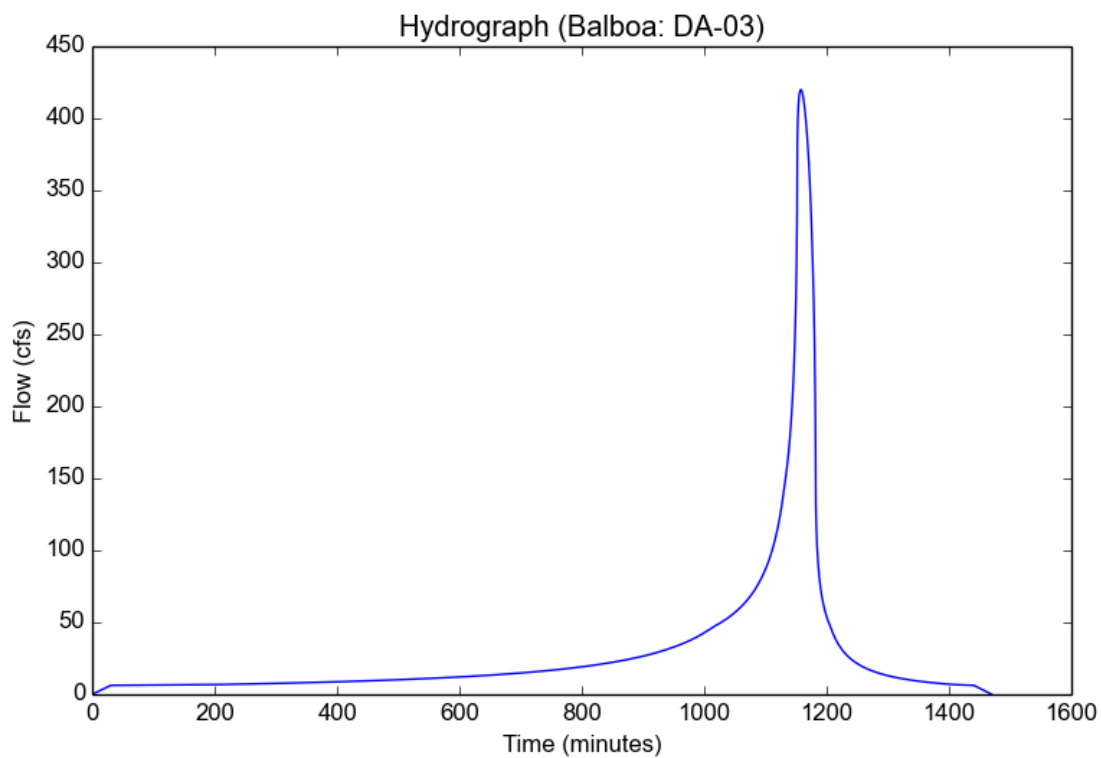
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0385
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.2494
Undeveloped Runoff Coefficient (Cu)	0.7508
Developed Runoff Coefficient (Cd)	0.7565
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	419.9854
Burned Peak Flow Rate (cfs)	419.9854
24-Hr Clear Runoff Volume (ac-ft)	59.4426
24-Hr Clear Runoff Volume (cu-ft)	2589318.5226



Peak Flow Hydrologic Analysis

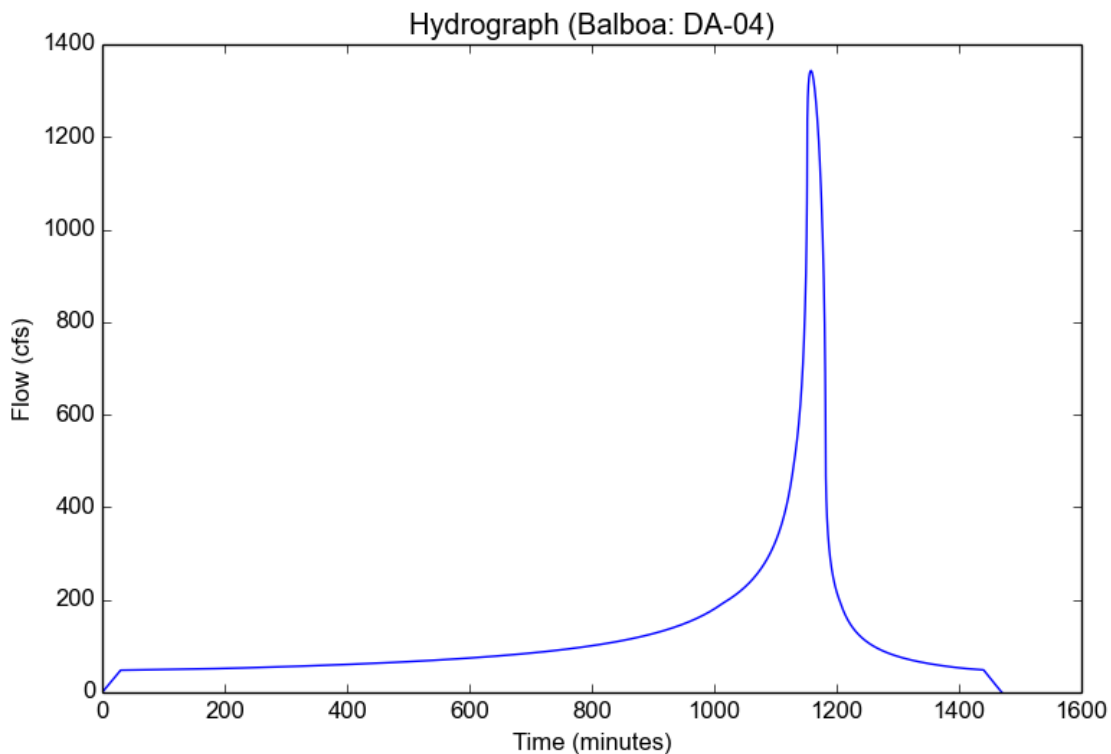
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.2843
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.2494
Undeveloped Runoff Coefficient (Cu)	0.7508
Developed Runoff Coefficient (Cd)	0.7932
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1343.3573
Burned Peak Flow Rate (cfs)	1343.3573
24-Hr Clear Runoff Volume (ac-ft)	260.275
24-Hr Clear Runoff Volume (cu-ft)	11337578.0766



Peak Flow Hydrologic Analysis

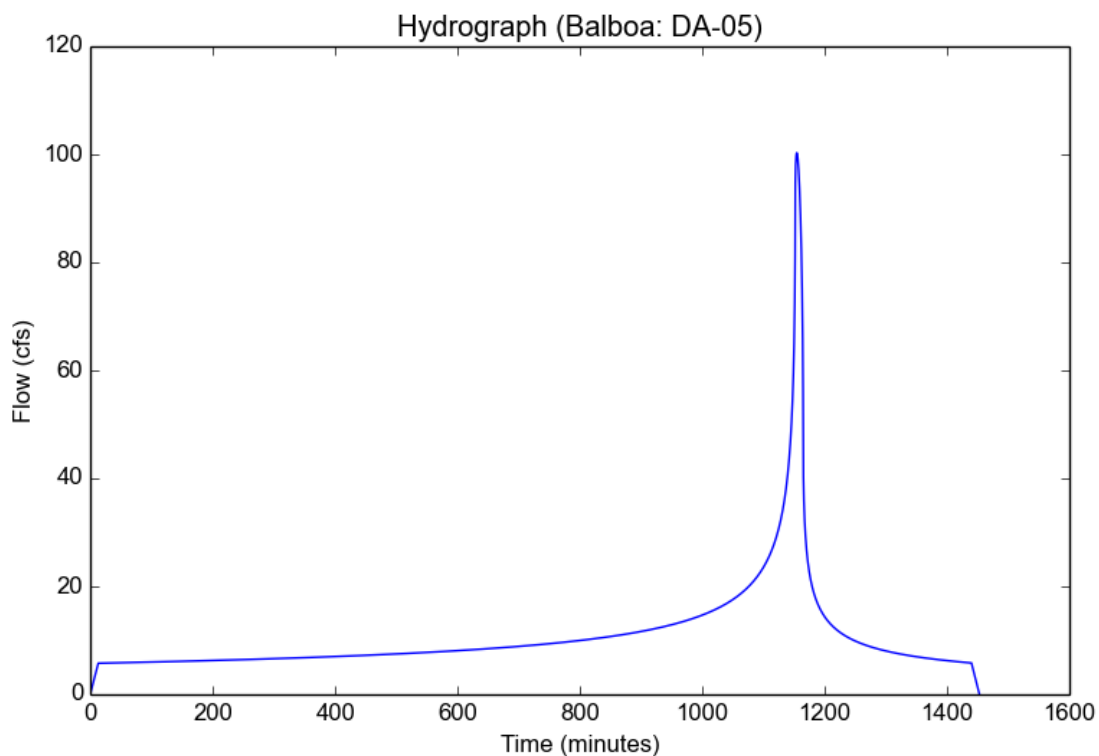
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.9871
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	3.3324
Undeveloped Runoff Coefficient (Cu)	0.8166
Developed Runoff Coefficient (Cd)	0.8989
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	100.2909
Burned Peak Flow Rate (cfs)	100.2909
24-Hr Clear Runoff Volume (ac-ft)	21.61
24-Hr Clear Runoff Volume (cu-ft)	941329.4919



Peak Flow Hydrologic Analysis

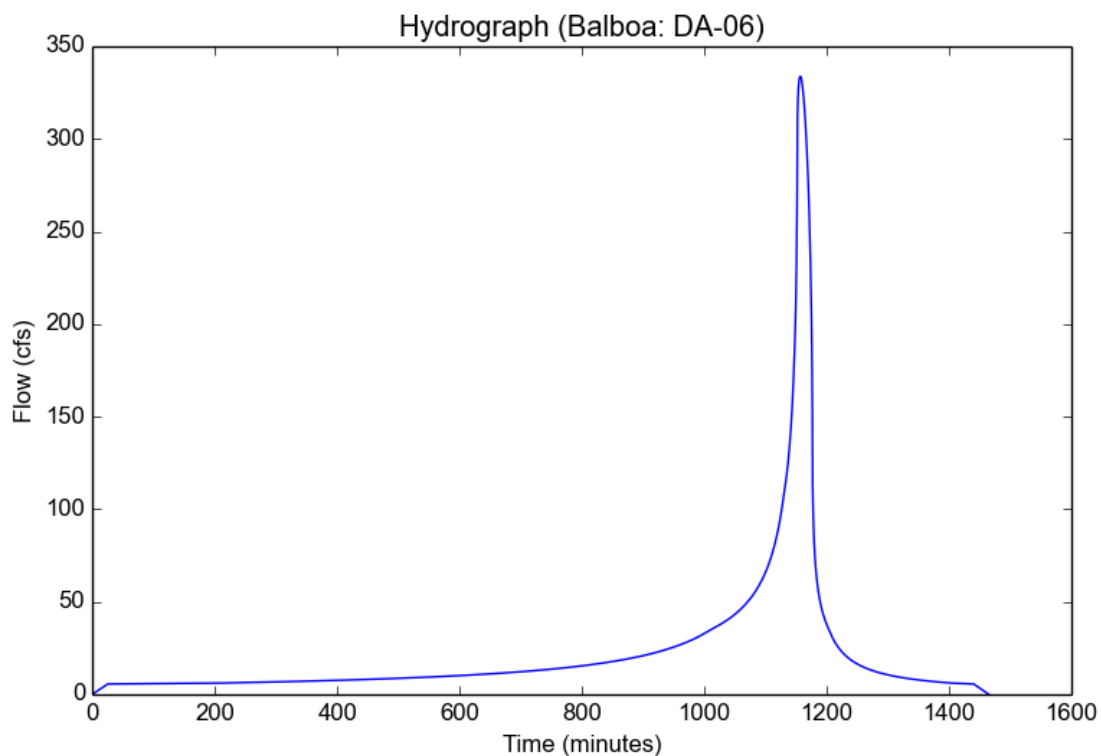
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.0806
Soil Type	64
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	2.4506
Undeveloped Runoff Coefficient (Cu)	0.765
Developed Runoff Coefficient (Cd)	0.7759
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	333.8545
Burned Peak Flow Rate (cfs)	333.8545
24-Hr Clear Runoff Volume (ac-ft)	45.4784
24-Hr Clear Runoff Volume (cu-ft)	1981039.1237



Peak Flow Hydrologic Analysis

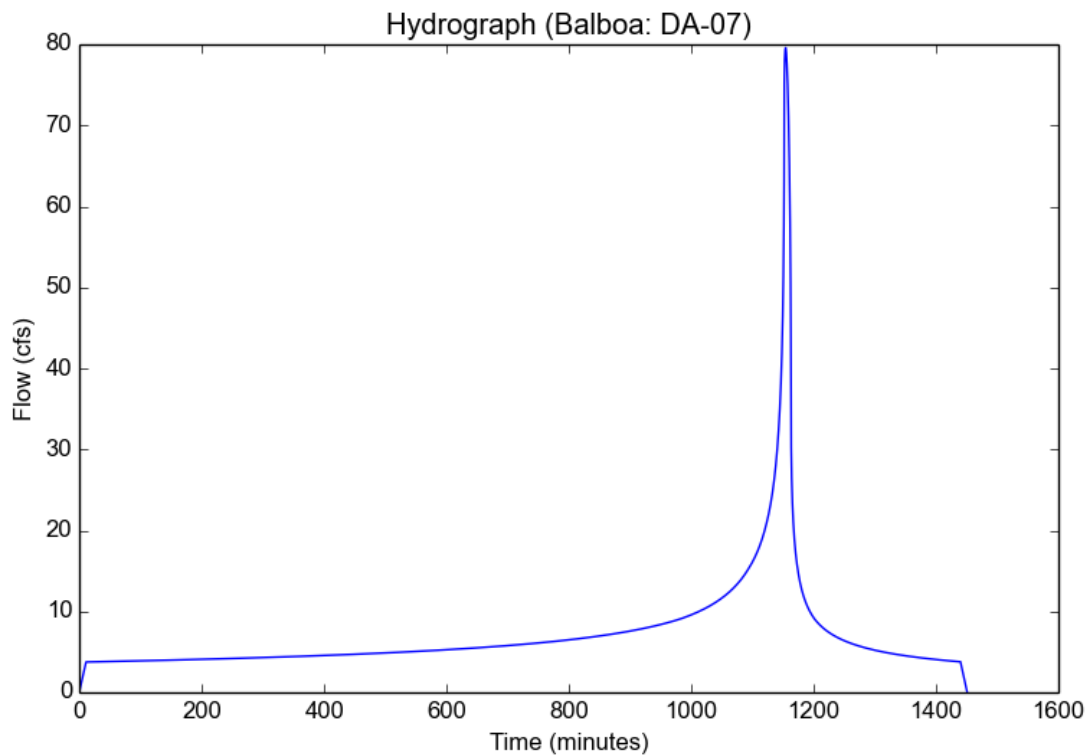
File location: C:/Users/Watearth - Will Hahn/Desktop/Balboa Report - Proposed Condition.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	7.8
Percent Impervious	0.8288
Soil Type	63
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.7516
Peak Intensity (in/hr)	3.6046
Undeveloped Runoff Coefficient (Cu)	0.7242
Developed Runoff Coefficient (Cd)	0.8699
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	79.5823
Burned Peak Flow Rate (cfs)	79.5823
24-Hr Clear Runoff Volume (ac-ft)	14.3367
24-Hr Clear Runoff Volume (cu-ft)	624505.3099



Peak Flow Hydrologic Analysis

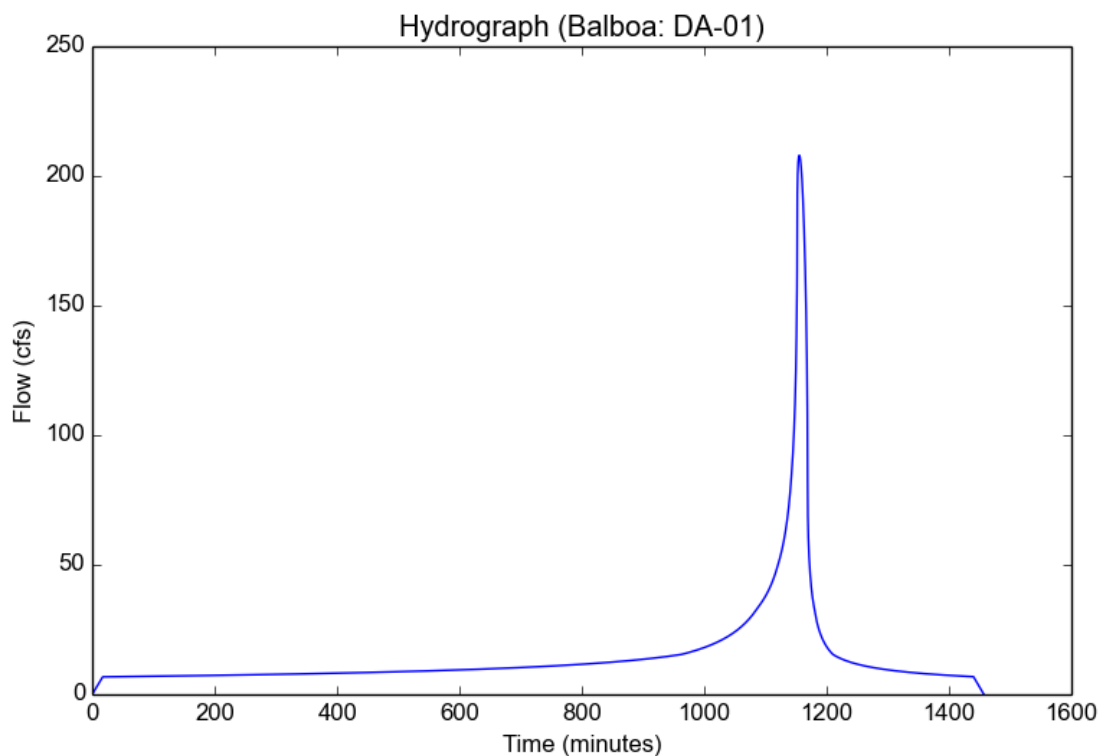
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-01
Area (ac)	86.91
Flow Path Length (ft)	3872.0
Flow Path Slope (vft/hft)	0.027
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.3466
Soil Type	63
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	3.1209
Undeveloped Runoff Coefficient (Cu)	0.6961
Developed Runoff Coefficient (Cd)	0.7668
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	207.9717
Burned Peak Flow Rate (cfs)	207.9717
24-Hr Clear Runoff Volume (ac-ft)	30.0686
24-Hr Clear Runoff Volume (cu-ft)	1309788.6552



Peak Flow Hydrologic Analysis

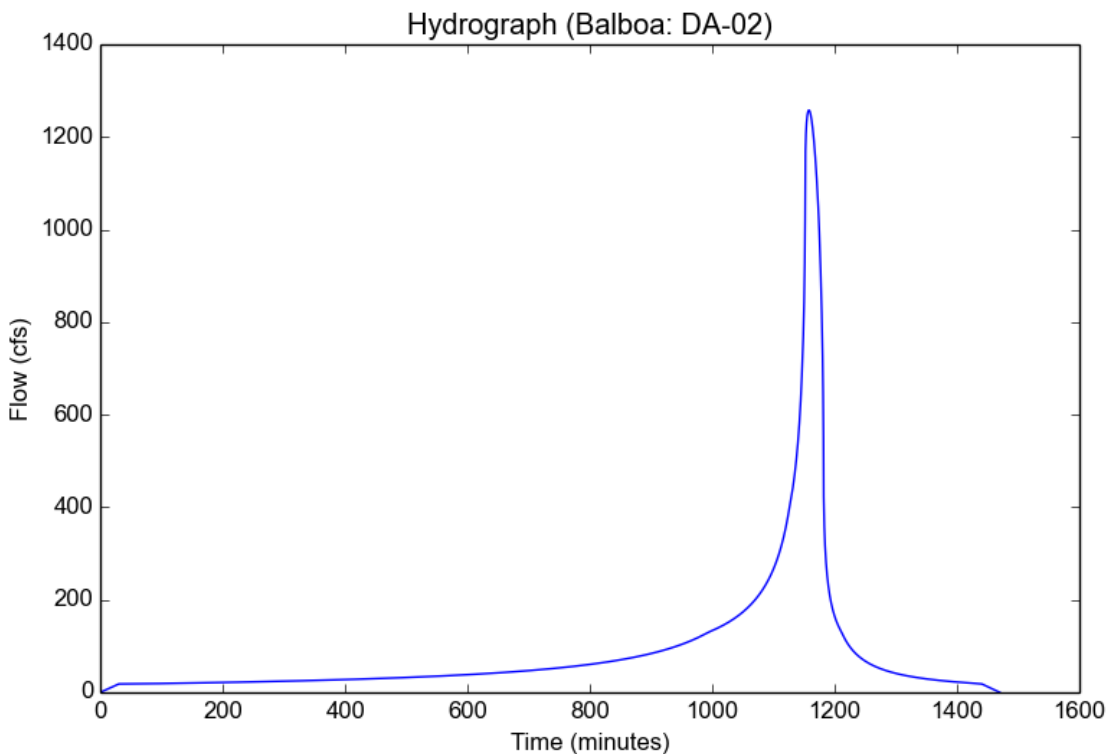
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-02
Area (ac)	687.42
Flow Path Length (ft)	15134.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.036
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	2.3897
Undeveloped Runoff Coefficient (Cu)	0.7607
Developed Runoff Coefficient (Cd)	0.7657
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1257.8318
Burned Peak Flow Rate (cfs)	1257.8318
24-Hr Clear Runoff Volume (ac-ft)	182.7914
24-Hr Clear Runoff Volume (cu-ft)	7962392.279



Peak Flow Hydrologic Analysis

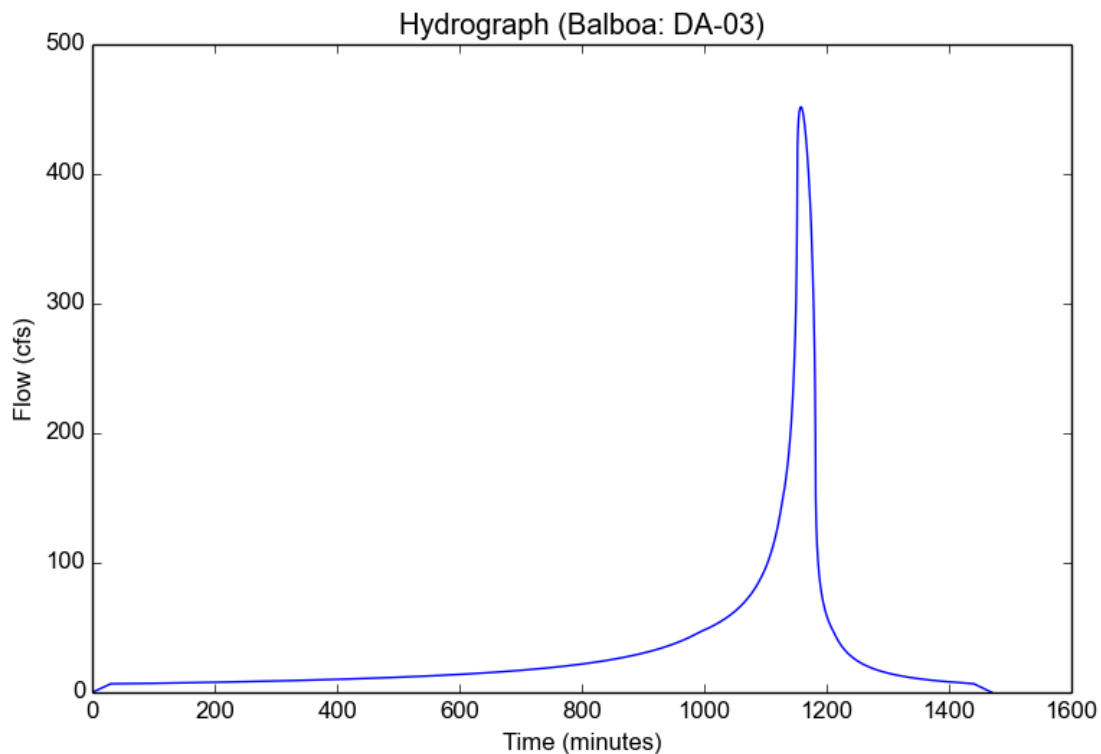
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-03
Area (ac)	246.8
Flow Path Length (ft)	12463.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.0385
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	2.3897
Undeveloped Runoff Coefficient (Cu)	0.7607
Developed Runoff Coefficient (Cd)	0.766
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	451.7967
Burned Peak Flow Rate (cfs)	451.7967
24-Hr Clear Runoff Volume (ac-ft)	65.8989
24-Hr Clear Runoff Volume (cu-ft)	2870554.0727



Peak Flow Hydrologic Analysis

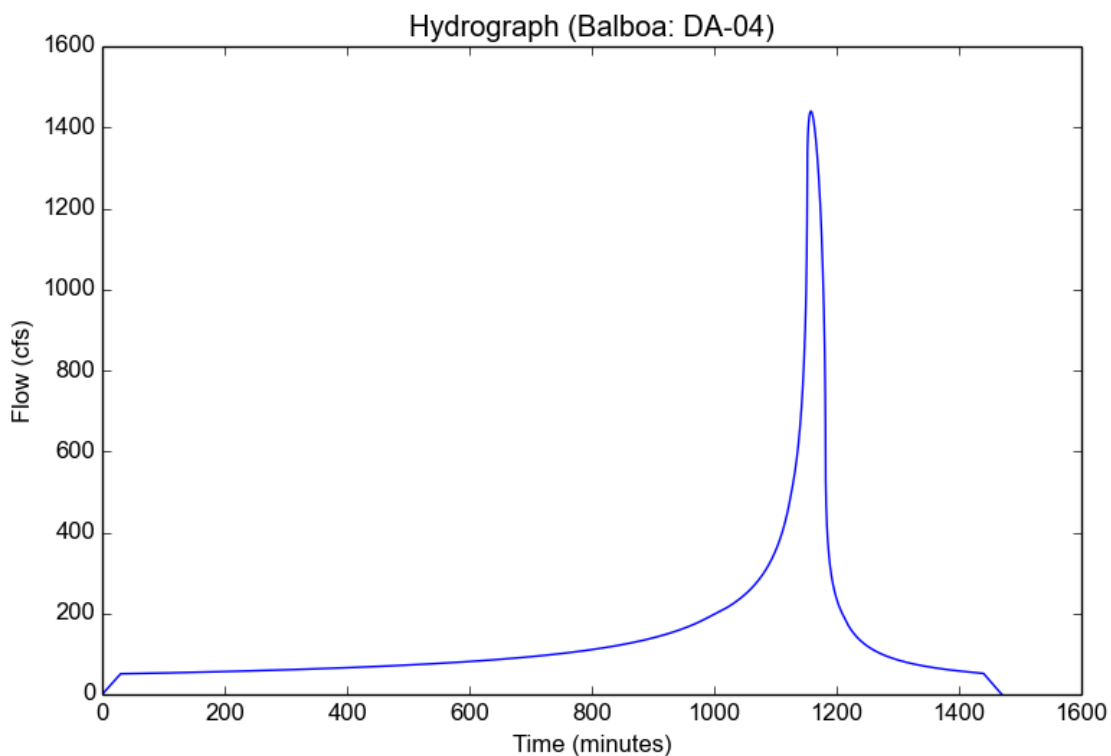
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-04
Area (ac)	752.91
Flow Path Length (ft)	10473.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.2843
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	2.3897
Undeveloped Runoff Coefficient (Cu)	0.7607
Developed Runoff Coefficient (Cd)	0.8003
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1439.9044
Burned Peak Flow Rate (cfs)	1439.9044
24-Hr Clear Runoff Volume (ac-ft)	282.7528
24-Hr Clear Runoff Volume (cu-ft)	12316709.795



Peak Flow Hydrologic Analysis

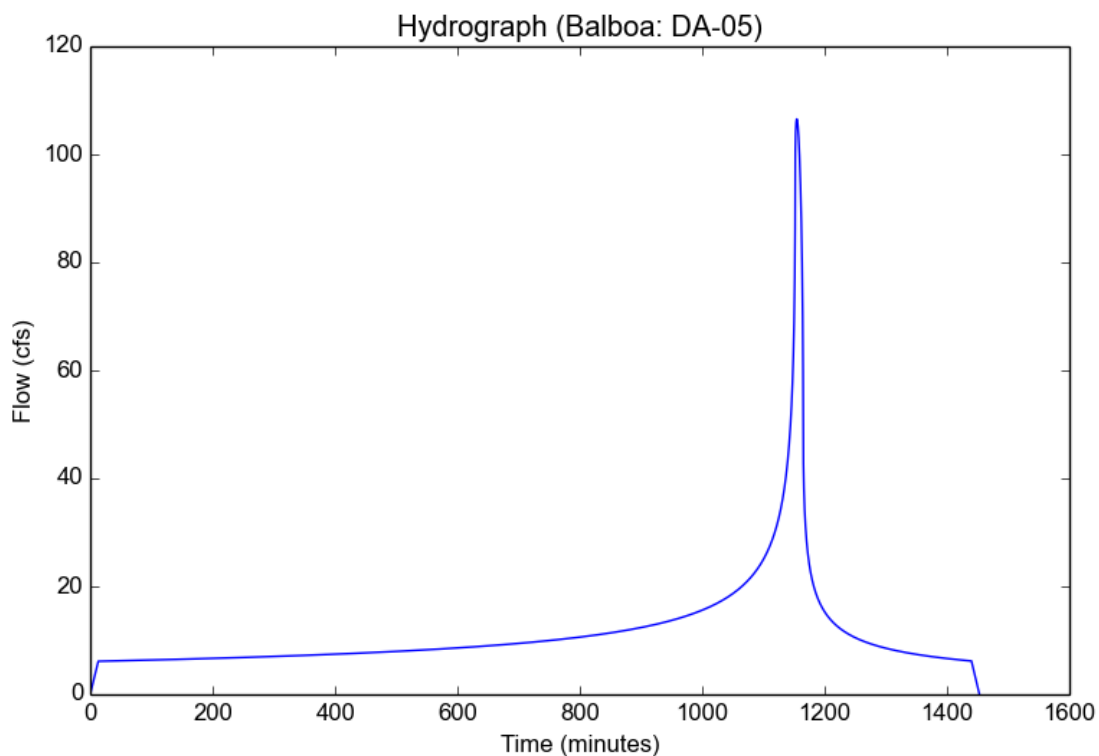
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-05
Area (ac)	33.48
Flow Path Length (ft)	2625.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.9871
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	3.5403
Undeveloped Runoff Coefficient (Cu)	0.8246
Developed Runoff Coefficient (Cd)	0.899
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	106.5602
Burned Peak Flow Rate (cfs)	106.5602
24-Hr Clear Runoff Volume (ac-ft)	22.9632
24-Hr Clear Runoff Volume (cu-ft)	1000275.5639



Peak Flow Hydrologic Analysis

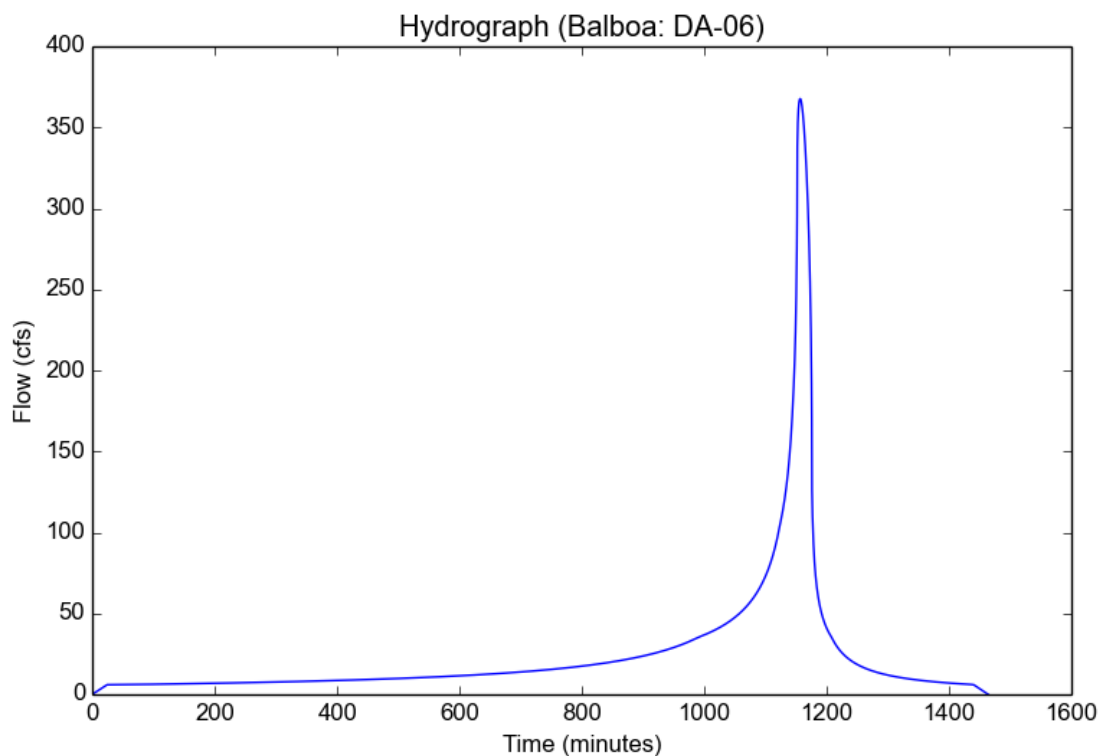
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Balboa
Subarea ID	DA-06
Area (ac)	175.59
Flow Path Length (ft)	7107.0
Flow Path Slope (vft/hft)	0.035
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.0806
Soil Type	64
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	2.6539
Undeveloped Runoff Coefficient (Cu)	0.7793
Developed Runoff Coefficient (Cd)	0.789
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	367.694
Burned Peak Flow Rate (cfs)	367.694
24-Hr Clear Runoff Volume (ac-ft)	50.203
24-Hr Clear Runoff Volume (cu-ft)	2186842.758



Peak Flow Hydrologic Analysis

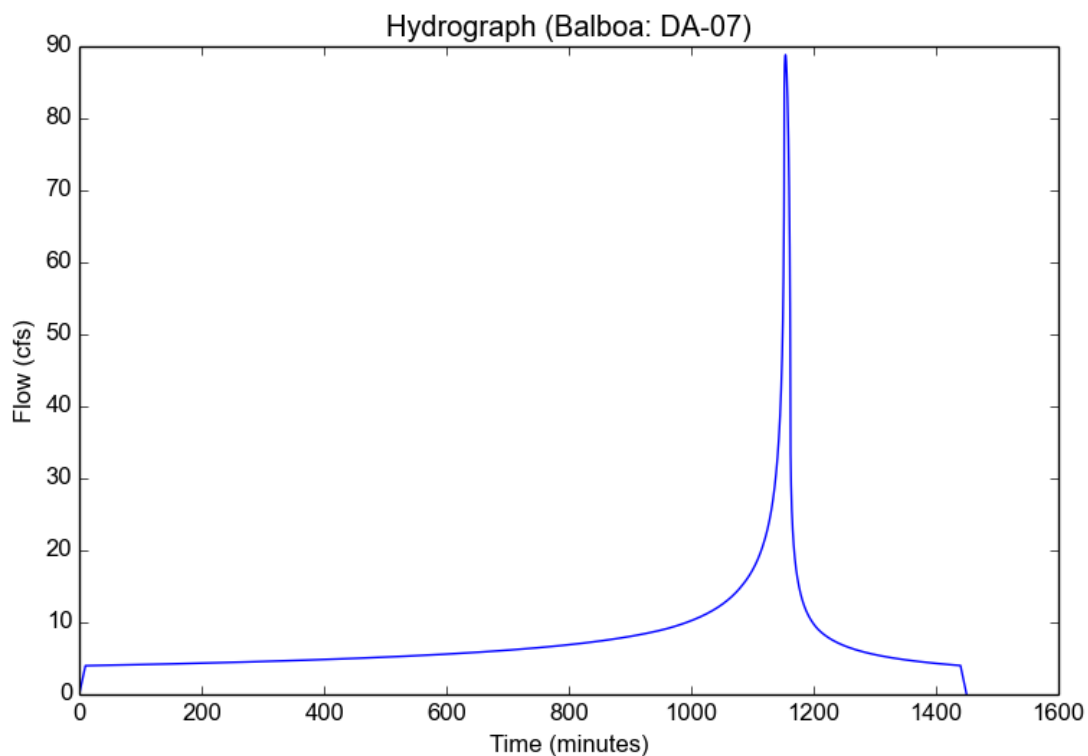
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Input Parameters

Project Name	Balboa
Subarea ID	DA-07
Area (ac)	25.38
Flow Path Length (ft)	2148.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	9.2976
Percent Impervious	0.8288
Soil Type	63
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	9.2976
Peak Intensity (in/hr)	4.0049
Undeveloped Runoff Coefficient (Cu)	0.7474
Developed Runoff Coefficient (Cd)	0.8739
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	88.8246
Burned Peak Flow Rate (cfs)	88.8246
24-Hr Clear Runoff Volume (ac-ft)	15.2576
24-Hr Clear Runoff Volume (cu-ft)	664618.9793



Peak Flow Hydrologic Analysis

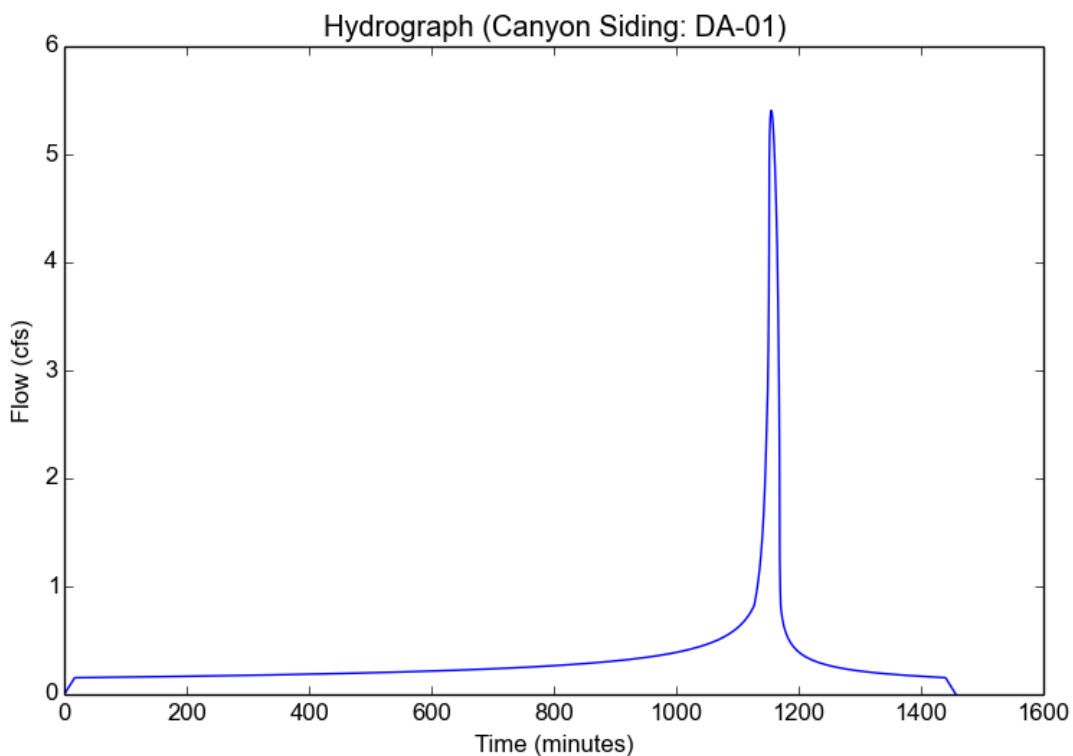
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-01
Area (ac)	10.52
Flow Path Length (ft)	976.0
Flow Path Slope (vft/hft)	0.094
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.180613567
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.9093
Undeveloped Runoff Coefficient (Cu)	0.4914
Developed Runoff Coefficient (Cd)	0.5652
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	5.4069
Burned Peak Flow Rate (cfs)	5.4069
24-Hr Clear Runoff Volume (ac-ft)	0.6536
24-Hr Clear Runoff Volume (cu-ft)	28472.0693



Peak Flow Hydrologic Analysis

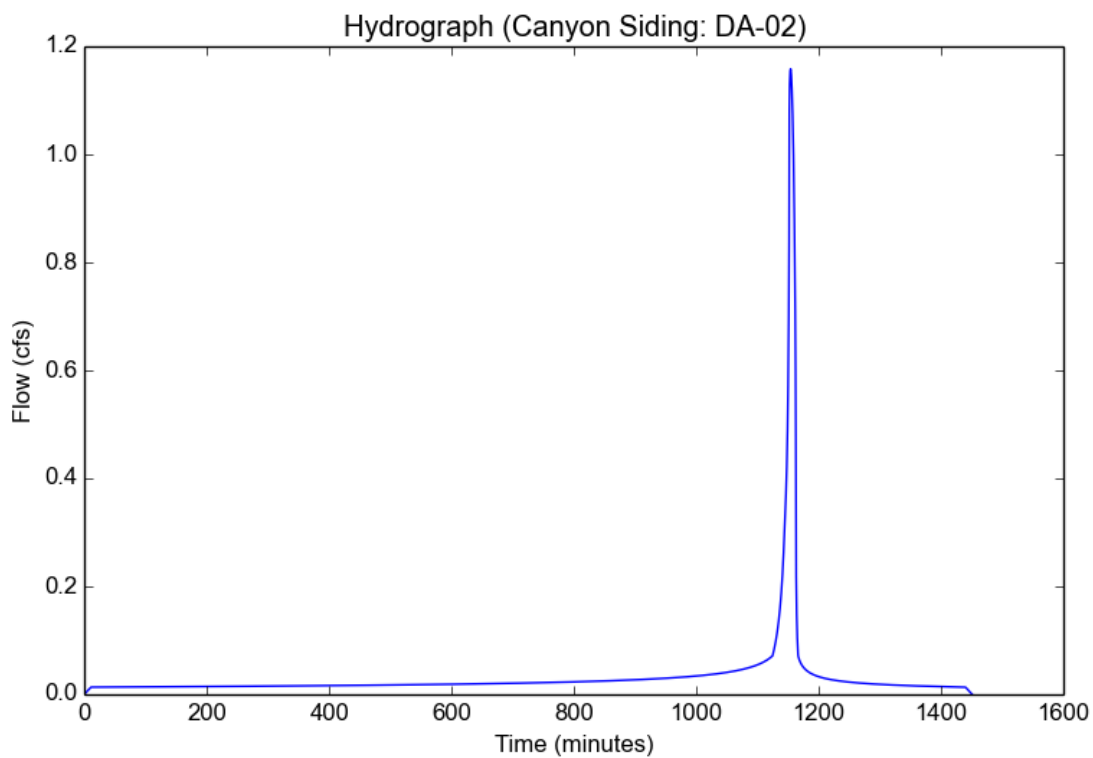
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-02
Area (ac)	1.89
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.15
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.022686757
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	1.1158
Undeveloped Runoff Coefficient (Cu)	0.5411
Developed Runoff Coefficient (Cd)	0.5492
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	1.1582
Burned Peak Flow Rate (cfs)	1.1582
24-Hr Clear Runoff Volume (ac-ft)	0.0672
24-Hr Clear Runoff Volume (cu-ft)	2925.3346



Peak Flow Hydrologic Analysis

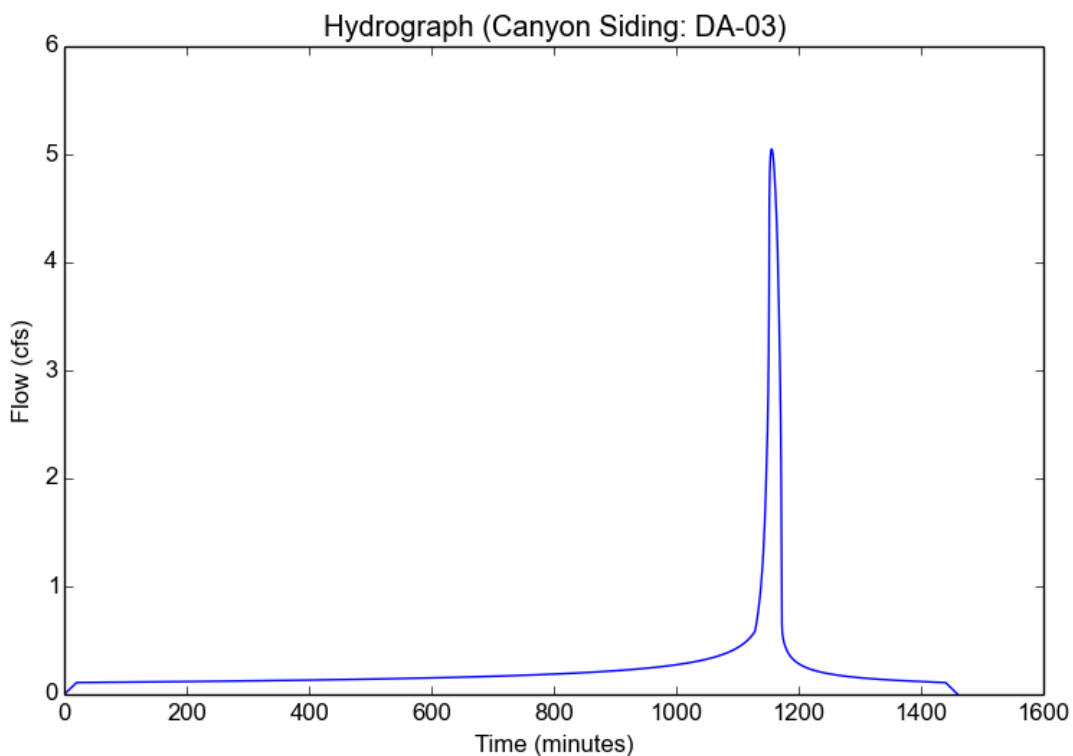
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-03
Area (ac)	12.03
Flow Path Length (ft)	1176.0
Flow Path Slope (vft/hft)	0.109
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.064263505
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.8424
Undeveloped Runoff Coefficient (Cu)	0.4707
Developed Runoff Coefficient (Cd)	0.4983
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	5.0501
Burned Peak Flow Rate (cfs)	5.0501
24-Hr Clear Runoff Volume (ac-ft)	0.5079
24-Hr Clear Runoff Volume (cu-ft)	22123.374



Peak Flow Hydrologic Analysis

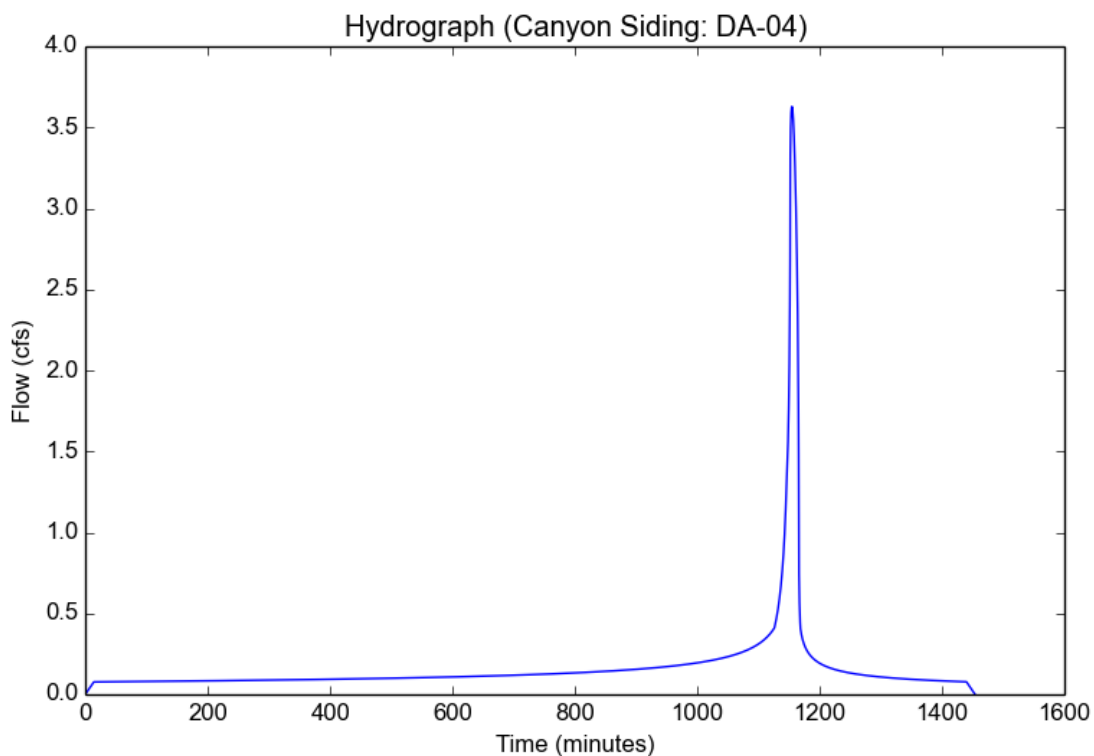
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-04
Area (ac)	6.44
Flow Path Length (ft)	927.0
Flow Path Slope (vft/hft)	0.223
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.123940231
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.9962
Undeveloped Runoff Coefficient (Cu)	0.5183
Developed Runoff Coefficient (Cd)	0.5656
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	3.6288
Burned Peak Flow Rate (cfs)	3.6288
24-Hr Clear Runoff Volume (ac-ft)	0.3389
24-Hr Clear Runoff Volume (cu-ft)	14764.5606



Peak Flow Hydrologic Analysis

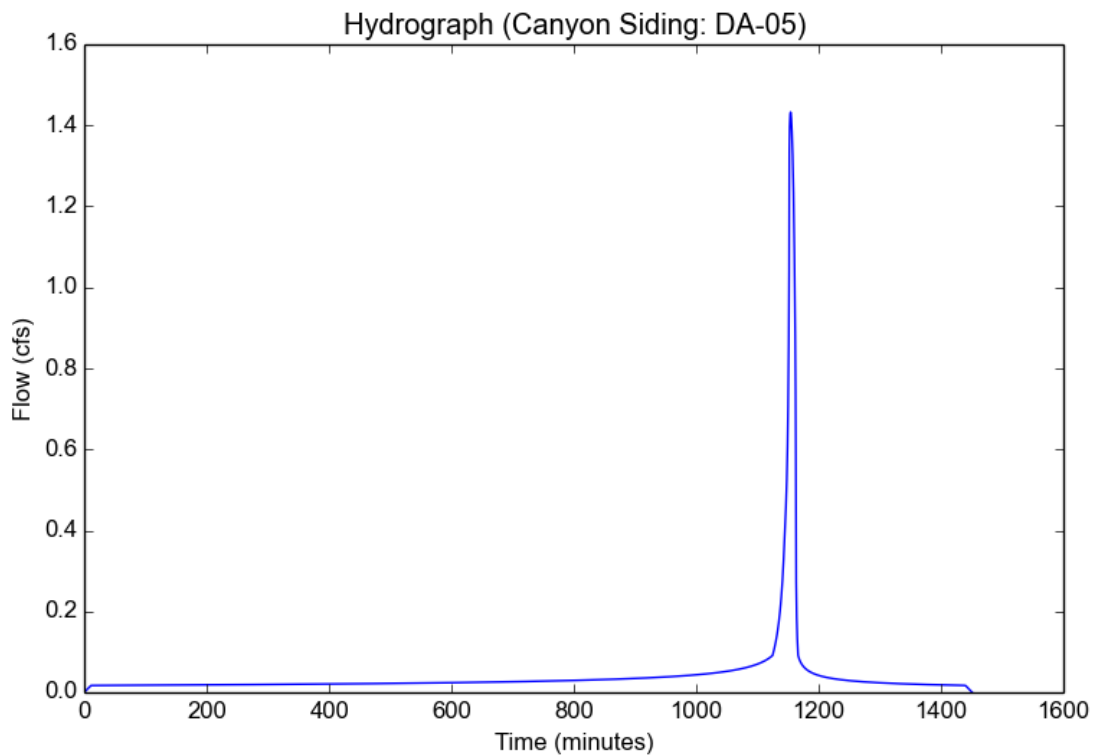
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-05
Area (ac)	2.33
Flow Path Length (ft)	622.0
Flow Path Slope (vft/hft)	0.248
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.027818059
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	1.1158
Undeveloped Runoff Coefficient (Cu)	0.5411
Developed Runoff Coefficient (Cd)	0.5511
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	1.4327
Burned Peak Flow Rate (cfs)	1.4327
24-Hr Clear Runoff Volume (ac-ft)	0.0848
24-Hr Clear Runoff Volume (cu-ft)	3694.8053



Peak Flow Hydrologic Analysis

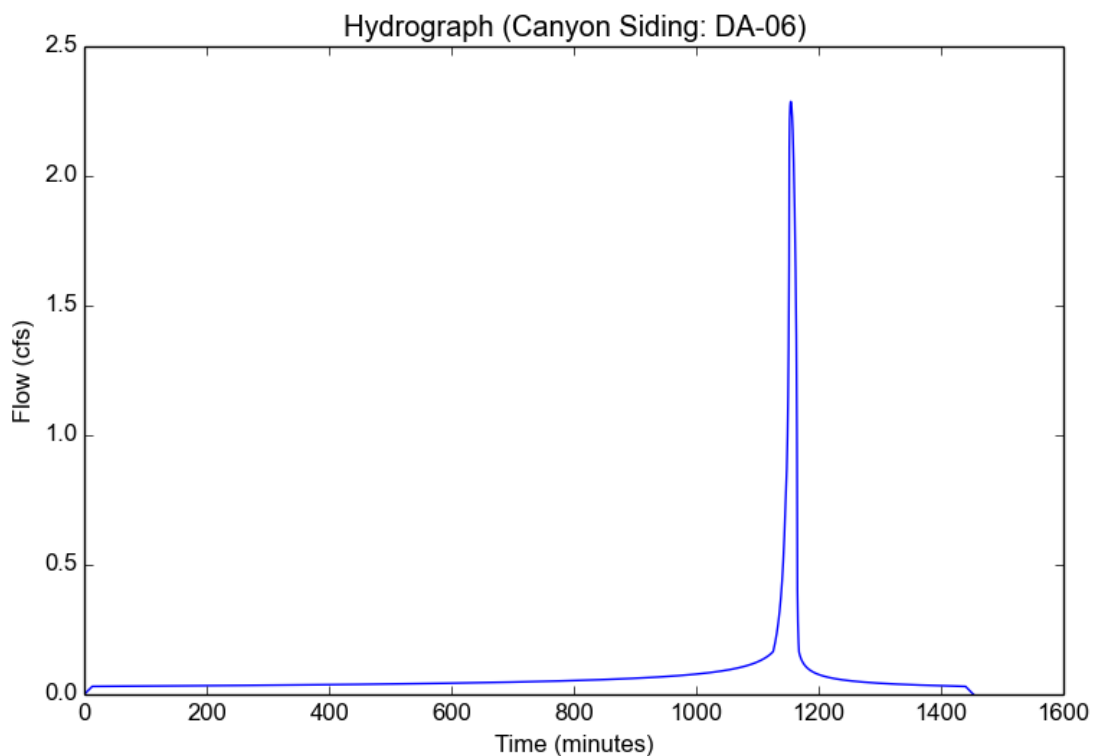
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-06
Area (ac)	4.13
Flow Path Length (ft)	792.0
Flow Path Slope (vft/hft)	0.24
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.030867097
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	1.0315
Undeveloped Runoff Coefficient (Cu)	0.5254
Developed Runoff Coefficient (Cd)	0.5369
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	2.2874
Burned Peak Flow Rate (cfs)	2.2874
24-Hr Clear Runoff Volume (ac-ft)	0.1522
24-Hr Clear Runoff Volume (cu-ft)	6631.2571



Peak Flow Hydrologic Analysis

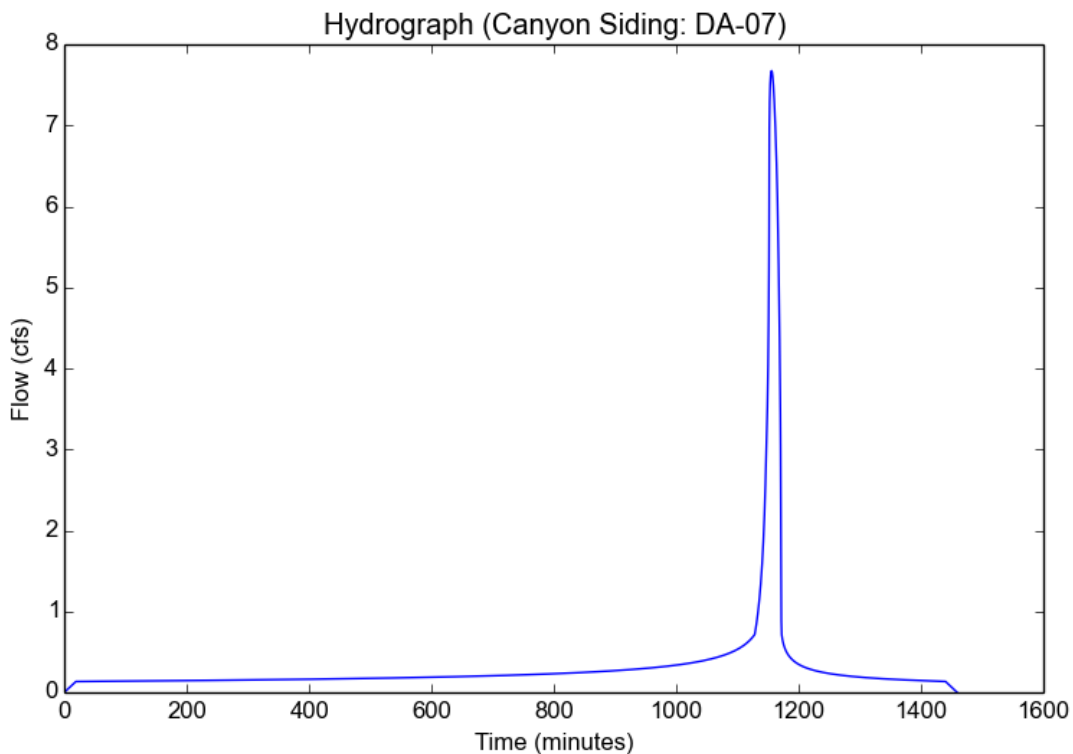
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-07
Area (ac)	18.18
Flow Path Length (ft)	1244.0
Flow Path Slope (vft/hft)	0.208
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.028608006
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.863
Undeveloped Runoff Coefficient (Cu)	0.4771
Developed Runoff Coefficient (Cd)	0.4892
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	7.6749
Burned Peak Flow Rate (cfs)	7.6749
24-Hr Clear Runoff Volume (ac-ft)	0.6579
24-Hr Clear Runoff Volume (cu-ft)	28660.0411



Peak Flow Hydrologic Analysis

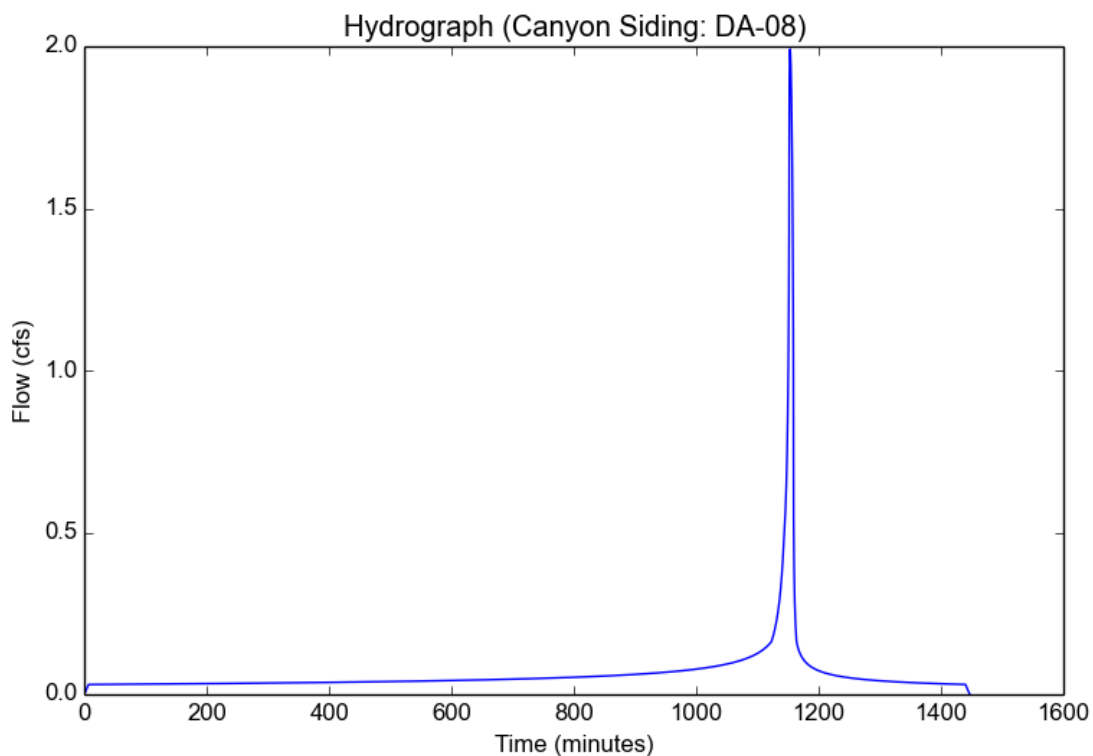
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-08
Area (ac)	2.26
Flow Path Length (ft)	472.0
Flow Path Slope (vft/hft)	0.438
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.156010454
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	1.3799
Undeveloped Runoff Coefficient (Cu)	0.5904
Developed Runoff Coefficient (Cd)	0.6387
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	1.9917
Burned Peak Flow Rate (cfs)	1.9917
24-Hr Clear Runoff Volume (ac-ft)	0.1318
24-Hr Clear Runoff Volume (cu-ft)	5740.8736



Peak Flow Hydrologic Analysis

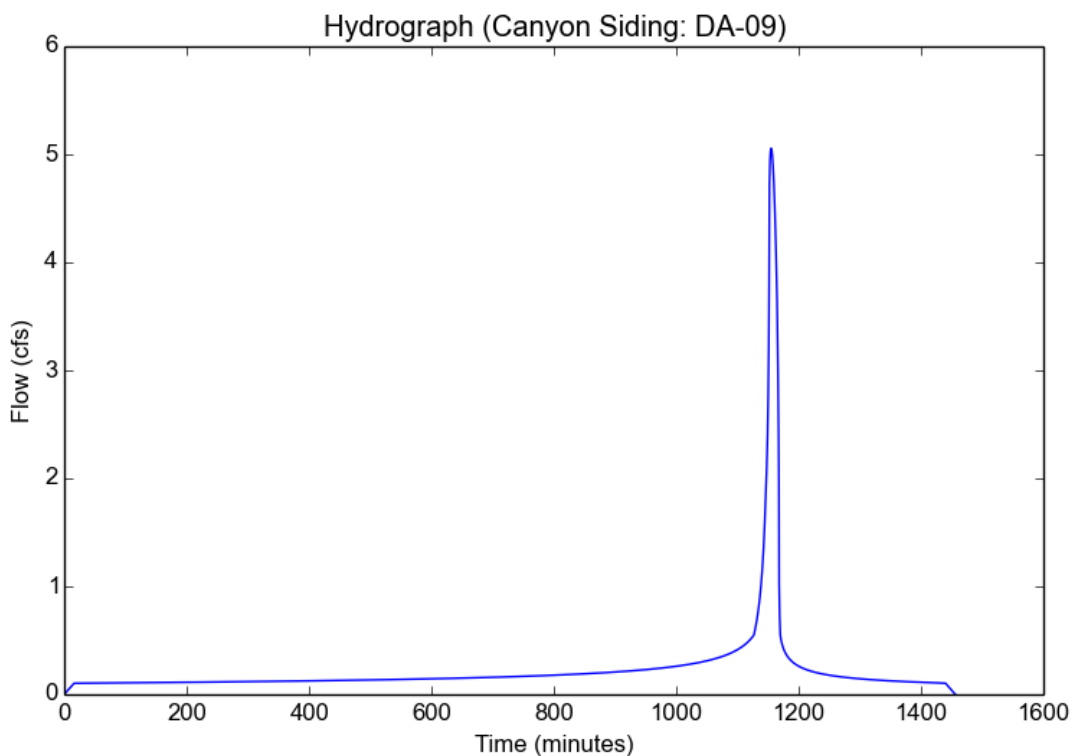
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-09
Area (ac)	10.11
Flow Path Length (ft)	1025.0
Flow Path Slope (vft/hft)	0.202
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.087673207
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.9356
Undeveloped Runoff Coefficient (Cu)	0.4996
Developed Runoff Coefficient (Cd)	0.5347
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	5.0574
Burned Peak Flow Rate (cfs)	5.0574
24-Hr Clear Runoff Volume (ac-ft)	0.4688
24-Hr Clear Runoff Volume (cu-ft)	20420.2818



Peak Flow Hydrologic Analysis

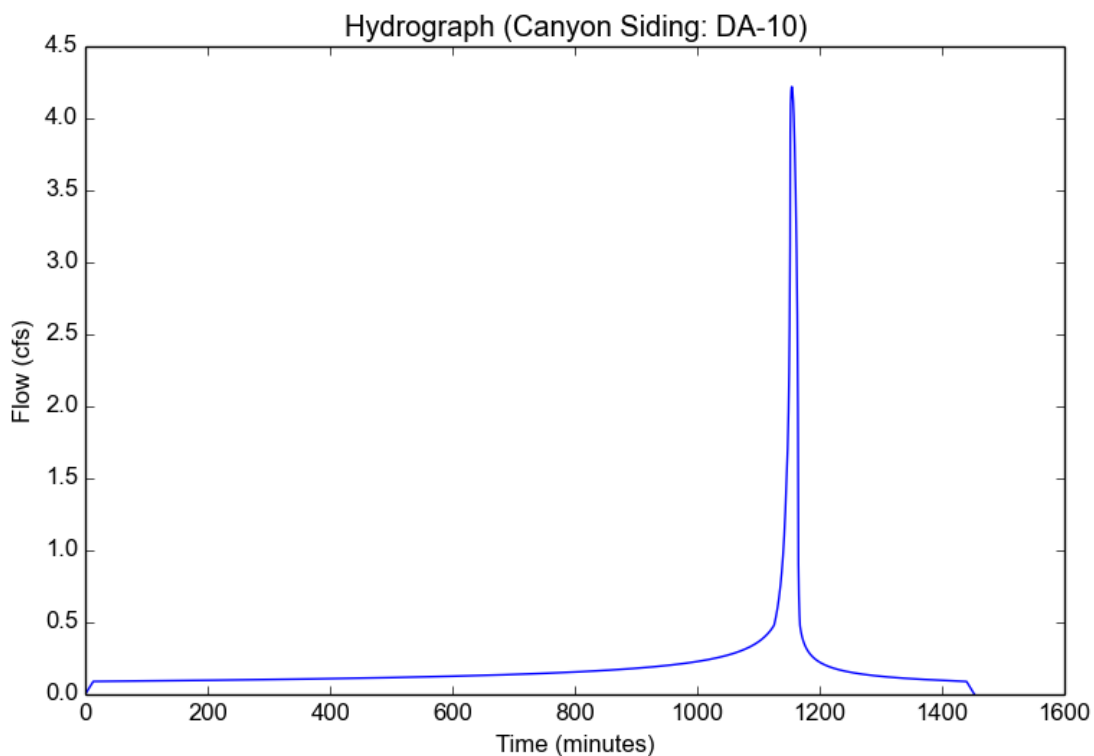
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-10
Area (ac)	7.08
Flow Path Length (ft)	887.0
Flow Path Slope (vft/hft)	0.226
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.140092863
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	1.0315
Undeveloped Runoff Coefficient (Cu)	0.5254
Developed Runoff Coefficient (Cd)	0.5779
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	4.2201
Burned Peak Flow Rate (cfs)	4.2201
24-Hr Clear Runoff Volume (ac-ft)	0.3923
24-Hr Clear Runoff Volume (cu-ft)	17090.3968



Peak Flow Hydrologic Analysis

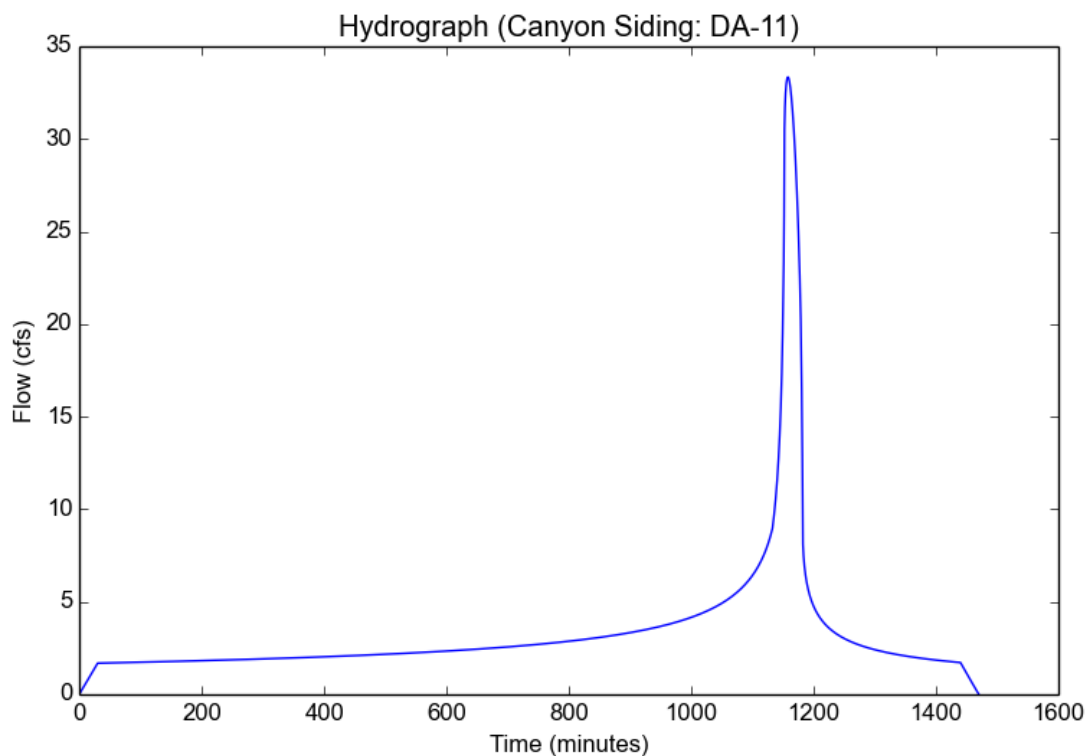
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-11
Area (ac)	87.33
Flow Path Length (ft)	4047.0
Flow Path Slope (vft/hft)	0.101
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.276140604
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.6963
Undeveloped Runoff Coefficient (Cu)	0.4142
Developed Runoff Coefficient (Cd)	0.5484
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	33.343
Burned Peak Flow Rate (cfs)	33.343
24-Hr Clear Runoff Volume (ac-ft)	6.7994
24-Hr Clear Runoff Volume (cu-ft)	296183.1262



Peak Flow Hydrologic Analysis

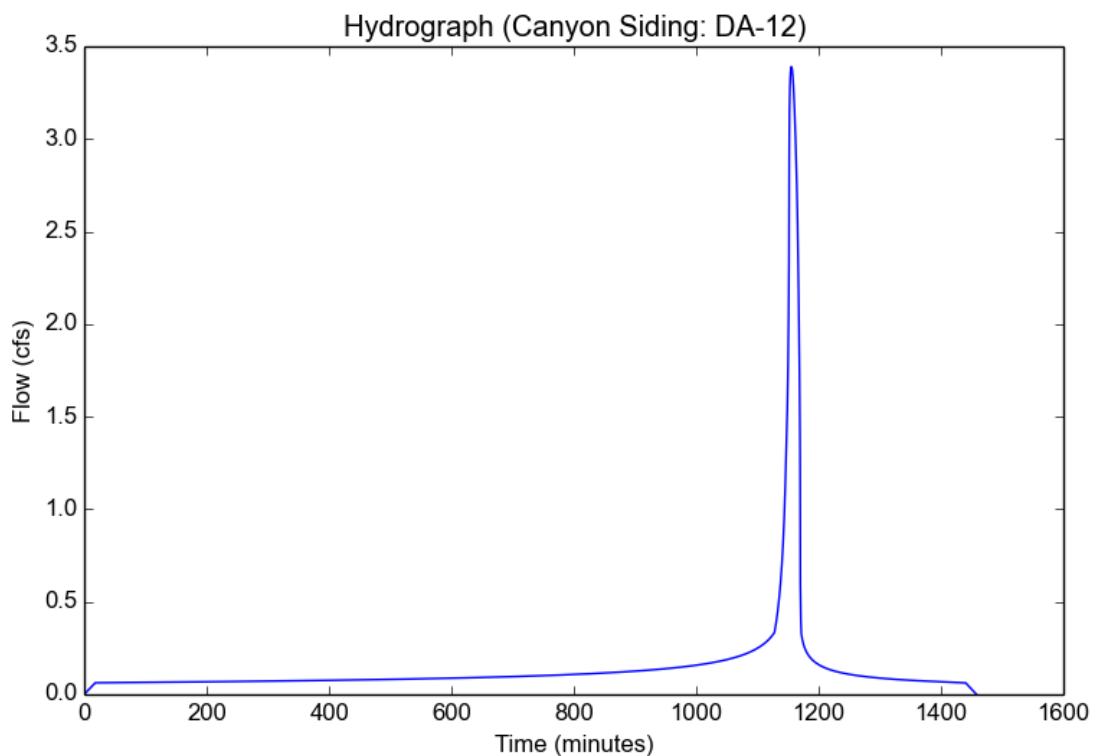
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-12
Area (ac)	7.61
Flow Path Length (ft)	1189.0
Flow Path Slope (vft/hft)	0.193
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.046514217
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.8852
Undeveloped Runoff Coefficient (Cu)	0.484
Developed Runoff Coefficient (Cd)	0.5033
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	3.3905
Burned Peak Flow Rate (cfs)	3.3905
24-Hr Clear Runoff Volume (ac-ft)	0.2989
24-Hr Clear Runoff Volume (cu-ft)	13020.8132



Peak Flow Hydrologic Analysis

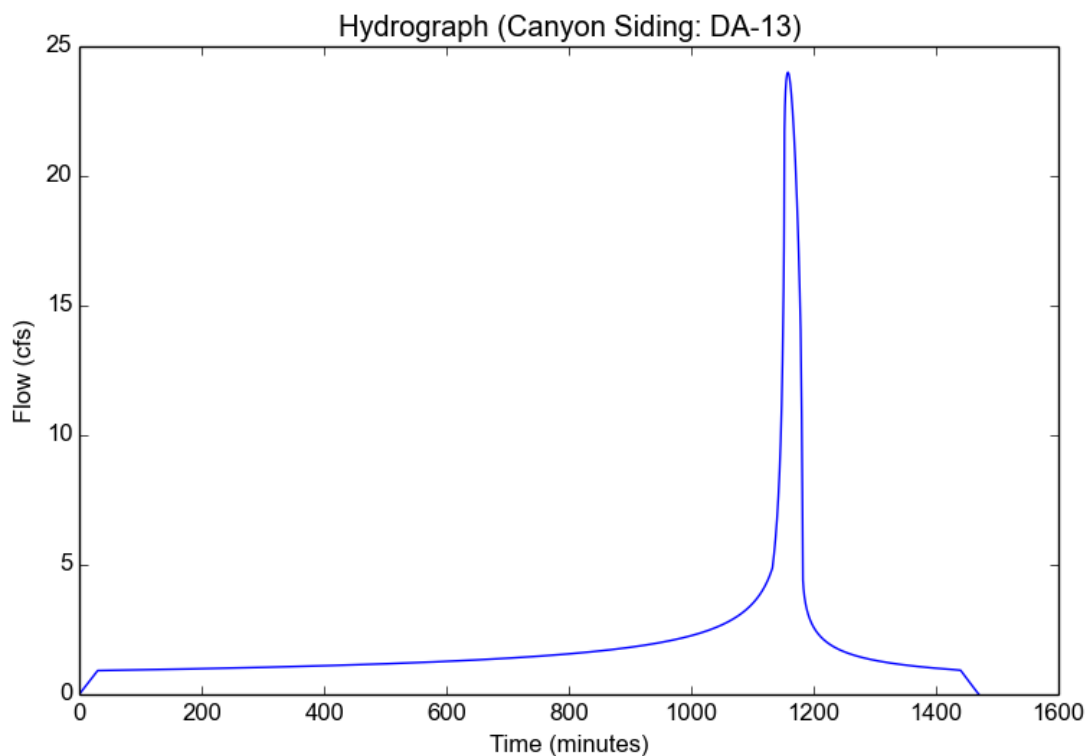
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-13
Area (ac)	71.28
Flow Path Length (ft)	4280.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.142666804
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.6963
Undeveloped Runoff Coefficient (Cu)	0.4142
Developed Runoff Coefficient (Cd)	0.4835
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	23.997
Burned Peak Flow Rate (cfs)	23.997
24-Hr Clear Runoff Volume (ac-ft)	3.9247
24-Hr Clear Runoff Volume (cu-ft)	170961.9395



Peak Flow Hydrologic Analysis

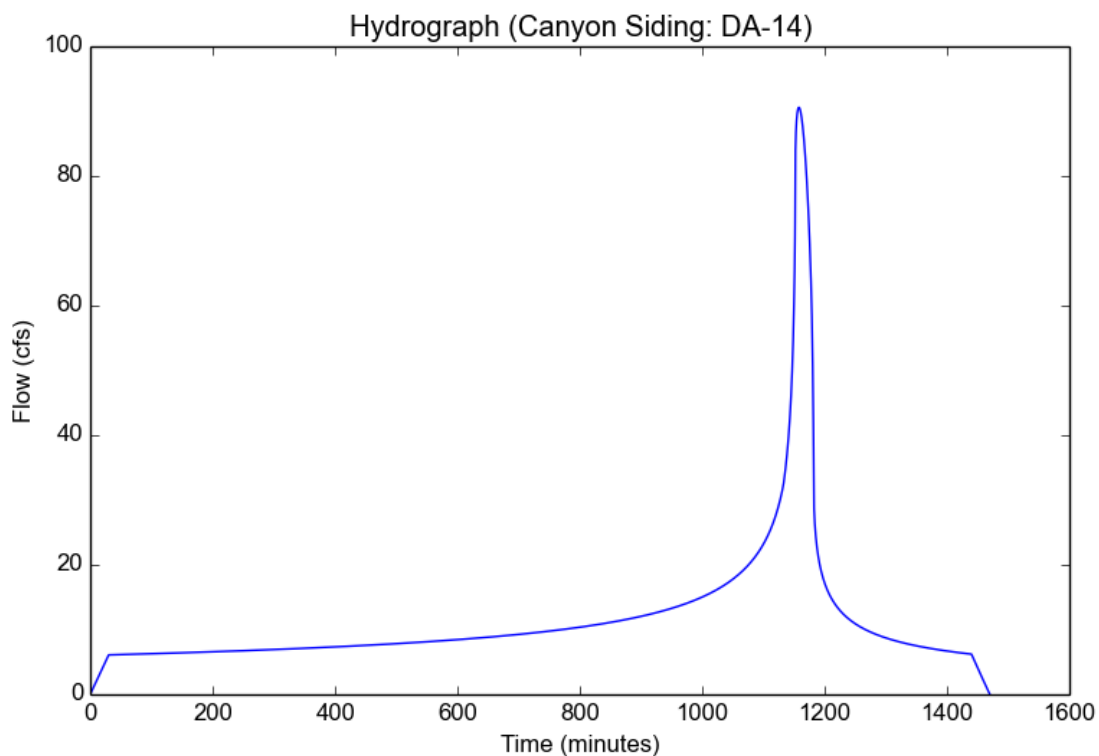
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-14
Area (ac)	194.19
Flow Path Length (ft)	6555.0
Flow Path Slope (vft/hft)	0.047
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.526484739
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.6963
Undeveloped Runoff Coefficient (Cu)	0.4142
Developed Runoff Coefficient (Cd)	0.67
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	90.5864
Burned Peak Flow Rate (cfs)	90.5864
24-Hr Clear Runoff Volume (ac-ft)	23.423
24-Hr Clear Runoff Volume (cu-ft)	1020307.5528



Peak Flow Hydrologic Analysis

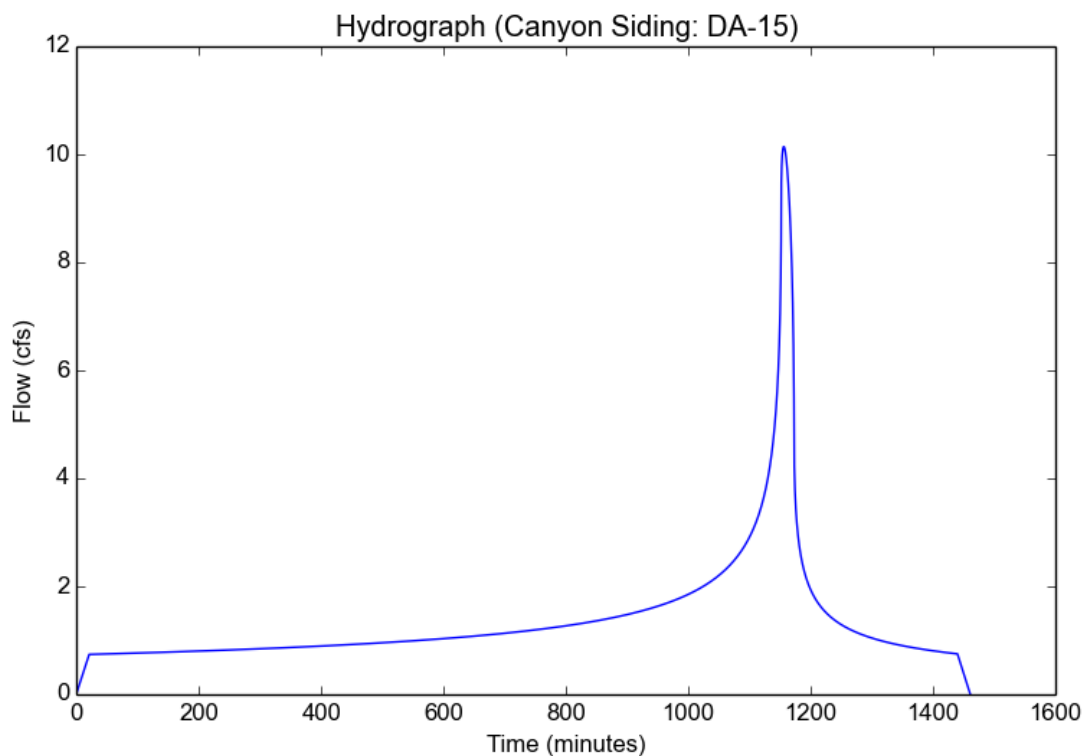
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-15
Area (ac)	13.69
Flow Path Length (ft)	2174.0
Flow Path Slope (vft/hft)	0.069
50-yr Rainfall Depth (in)	7.0
Percent Impervious	1.0
Soil Type	97
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.709
Peak Intensity (in/hr)	0.8234
Undeveloped Runoff Coefficient (Cu)	0.4648
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	10.1445
Burned Peak Flow Rate (cfs)	10.1445
24-Hr Clear Runoff Volume (ac-ft)	2.7585
24-Hr Clear Runoff Volume (cu-ft)	120159.9924



Peak Flow Hydrologic Analysis

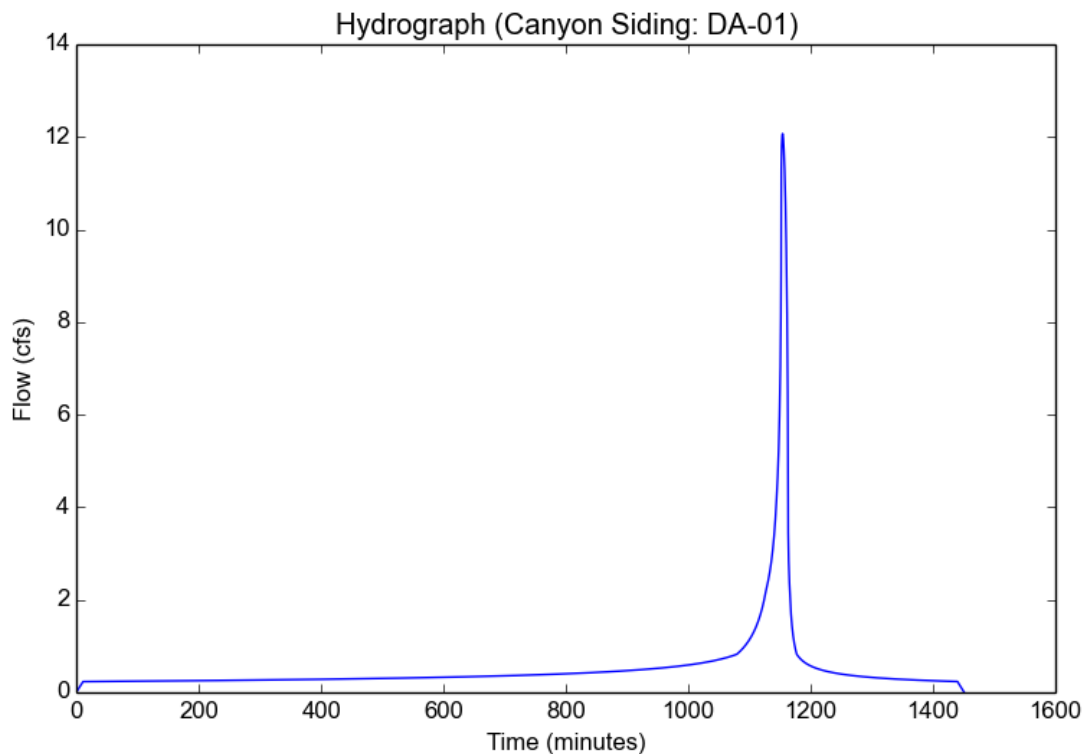
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-01
Area (ac)	10.52
Flow Path Length (ft)	976.0
Flow Path Slope (vft/hft)	0.094
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.180613567
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.6837
Undeveloped Runoff Coefficient (Cu)	0.6333
Developed Runoff Coefficient (Cd)	0.6815
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	12.0708
Burned Peak Flow Rate (cfs)	12.0708
24-Hr Clear Runoff Volume (ac-ft)	1.0677
24-Hr Clear Runoff Volume (cu-ft)	46509.2902



Peak Flow Hydrologic Analysis

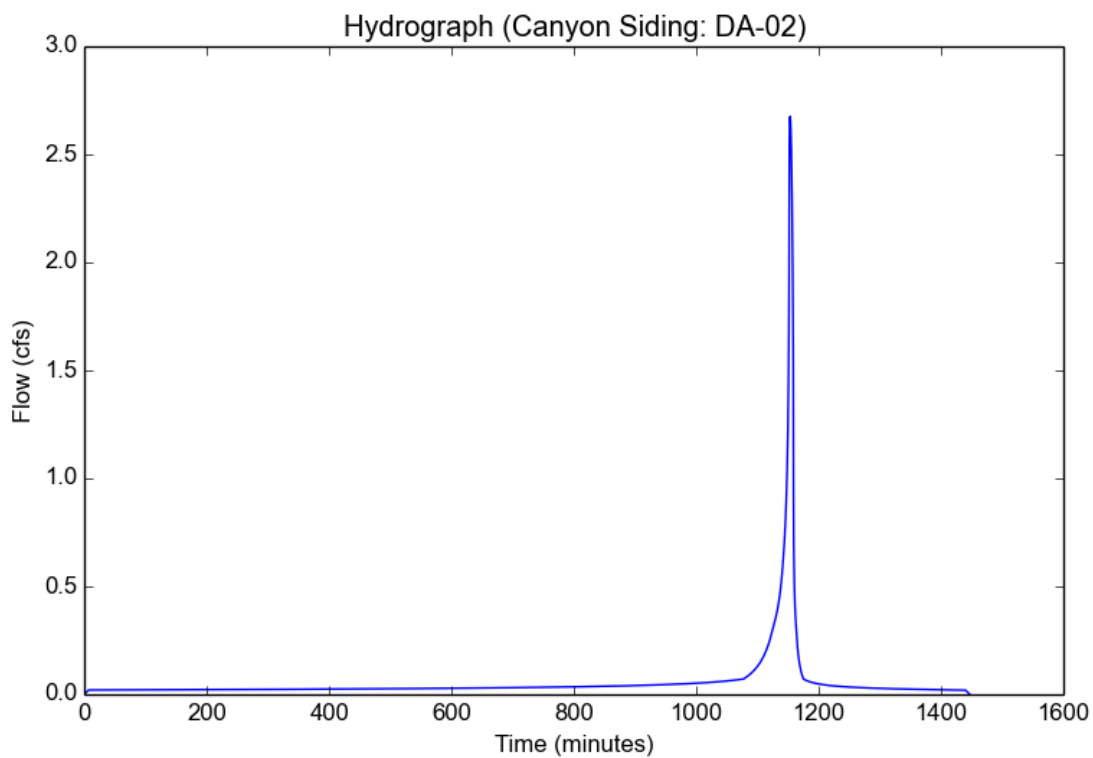
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-02
Area (ac)	1.89
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.15
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.022686757
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	2.0823
Undeveloped Runoff Coefficient (Cu)	0.6747
Developed Runoff Coefficient (Cd)	0.6798
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	2.6754
Burned Peak Flow Rate (cfs)	2.6754
24-Hr Clear Runoff Volume (ac-ft)	0.1185
24-Hr Clear Runoff Volume (cu-ft)	5160.6348



Peak Flow Hydrologic Analysis

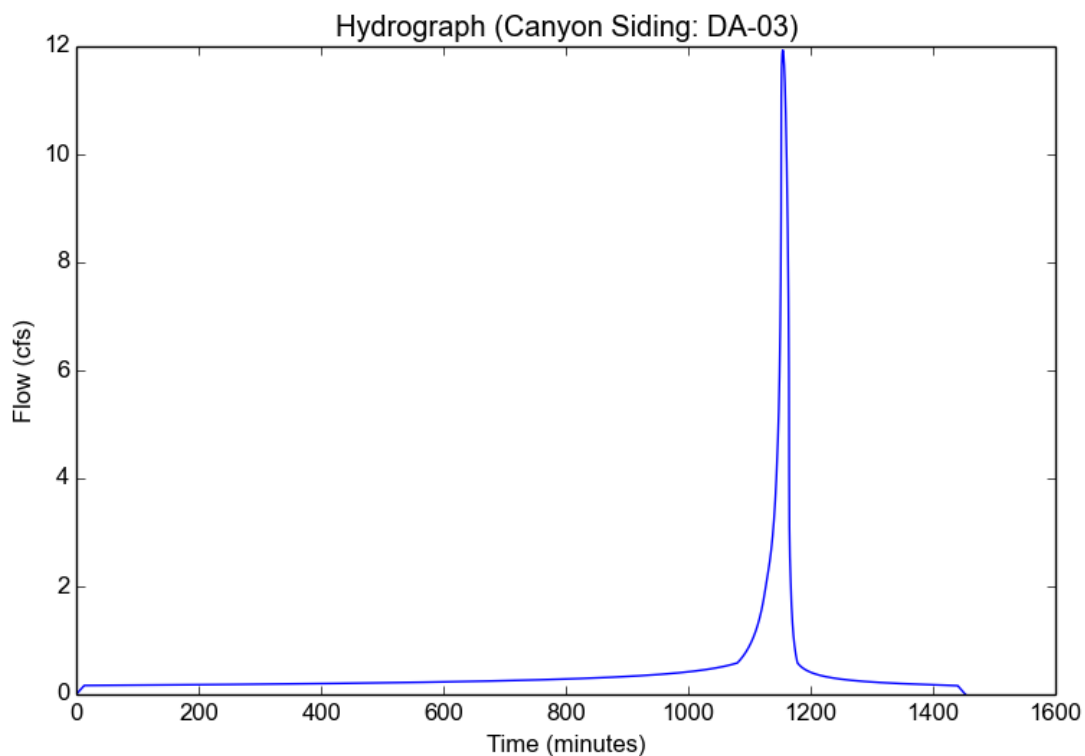
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-03
Area (ac)	12.03
Flow Path Length (ft)	1176.0
Flow Path Slope (vft/hft)	0.109
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.064263505
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.5566
Undeveloped Runoff Coefficient (Cu)	0.6191
Developed Runoff Coefficient (Cd)	0.6372
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	11.9316
Burned Peak Flow Rate (cfs)	11.9316
24-Hr Clear Runoff Volume (ac-ft)	0.8739
24-Hr Clear Runoff Volume (cu-ft)	38066.9905



Peak Flow Hydrologic Analysis

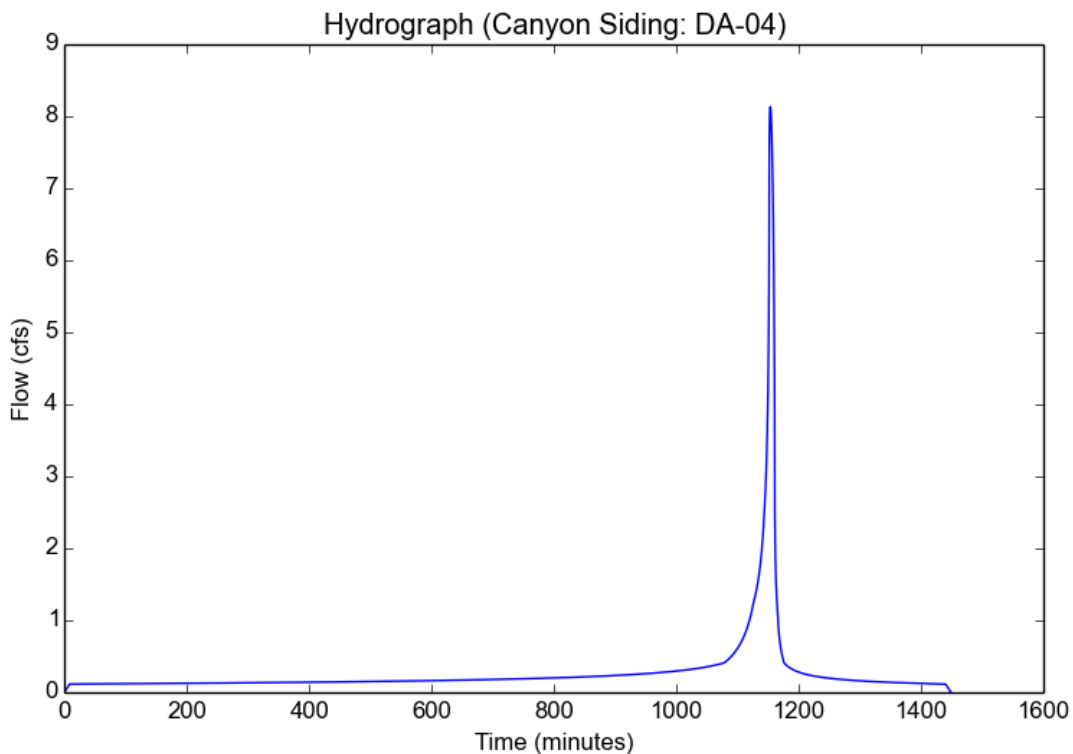
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-04
Area (ac)	6.44
Flow Path Length (ft)	927.0
Flow Path Slope (vft/hft)	0.223
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.123940231
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.8503
Undeveloped Runoff Coefficient (Cu)	0.6519
Developed Runoff Coefficient (Cd)	0.6826
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	8.1339
Burned Peak Flow Rate (cfs)	8.1339
24-Hr Clear Runoff Volume (ac-ft)	0.564
24-Hr Clear Runoff Volume (cu-ft)	24566.6302



Peak Flow Hydrologic Analysis

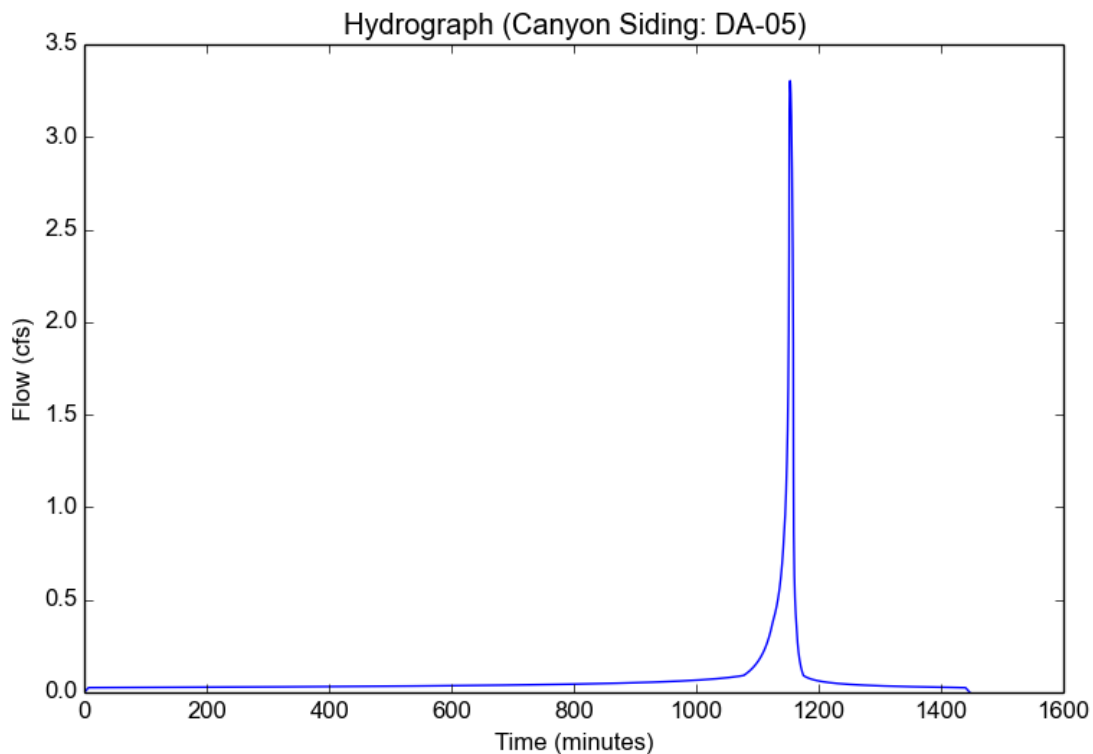
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-05
Area (ac)	2.33
Flow Path Length (ft)	622.0
Flow Path Slope (vft/hft)	0.248
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.027818059
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	2.0823
Undeveloped Runoff Coefficient (Cu)	0.6747
Developed Runoff Coefficient (Cd)	0.681
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	3.3039
Burned Peak Flow Rate (cfs)	3.3039
24-Hr Clear Runoff Volume (ac-ft)	0.149
24-Hr Clear Runoff Volume (cu-ft)	6490.6829



Peak Flow Hydrologic Analysis

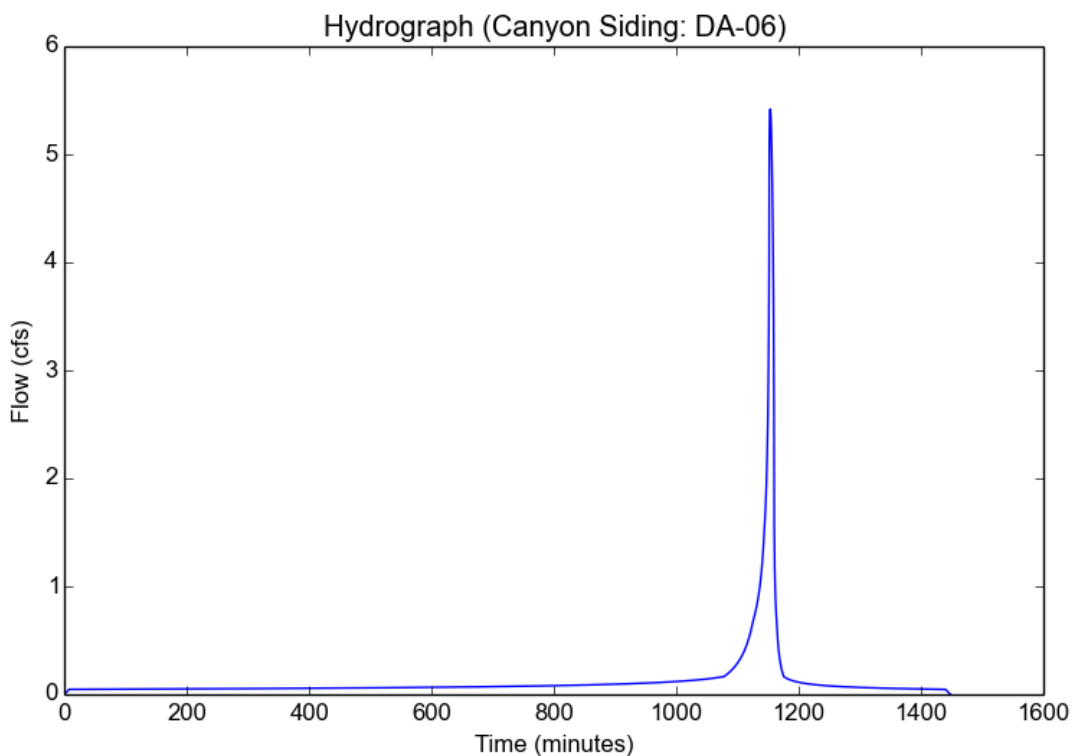
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-06
Area (ac)	4.13
Flow Path Length (ft)	792.0
Flow Path Slope (vft/hft)	0.24
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.030867097
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.9556
Undeveloped Runoff Coefficient (Cu)	0.6636
Developed Runoff Coefficient (Cd)	0.6709
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	5.4185
Burned Peak Flow Rate (cfs)	5.4185
24-Hr Clear Runoff Volume (ac-ft)	0.267
24-Hr Clear Runoff Volume (cu-ft)	11628.7382



Peak Flow Hydrologic Analysis

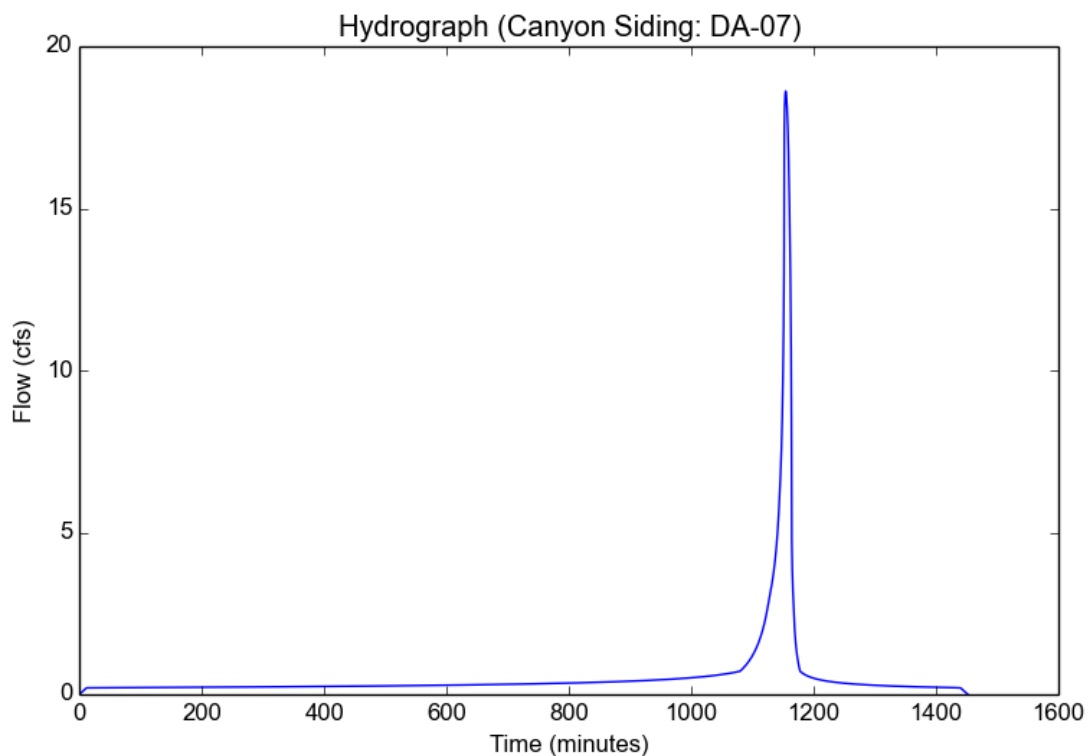
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-07
Area (ac)	18.18
Flow Path Length (ft)	1244.0
Flow Path Slope (vft/hft)	0.208
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.028608006
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.6163
Undeveloped Runoff Coefficient (Cu)	0.6258
Developed Runoff Coefficient (Cd)	0.6336
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	18.6182
Burned Peak Flow Rate (cfs)	18.6182
24-Hr Clear Runoff Volume (ac-ft)	1.1612
24-Hr Clear Runoff Volume (cu-ft)	50579.8594



Peak Flow Hydrologic Analysis

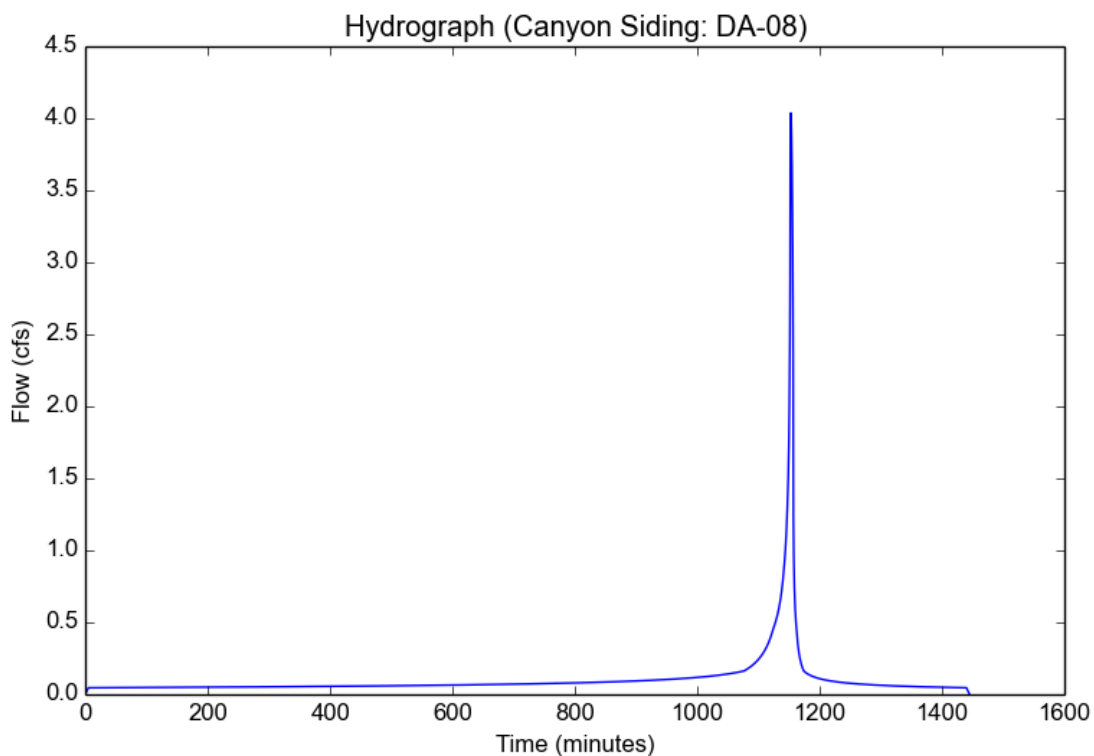
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-08
Area (ac)	2.26
Flow Path Length (ft)	472.0
Flow Path Slope (vft/hft)	0.438
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.156010454
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	2.439
Undeveloped Runoff Coefficient (Cu)	0.7014
Developed Runoff Coefficient (Cd)	0.7324
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.0372
Burned Peak Flow Rate (cfs)	4.0372
24-Hr Clear Runoff Volume (ac-ft)	0.2163
24-Hr Clear Runoff Volume (cu-ft)	9421.8349



Peak Flow Hydrologic Analysis

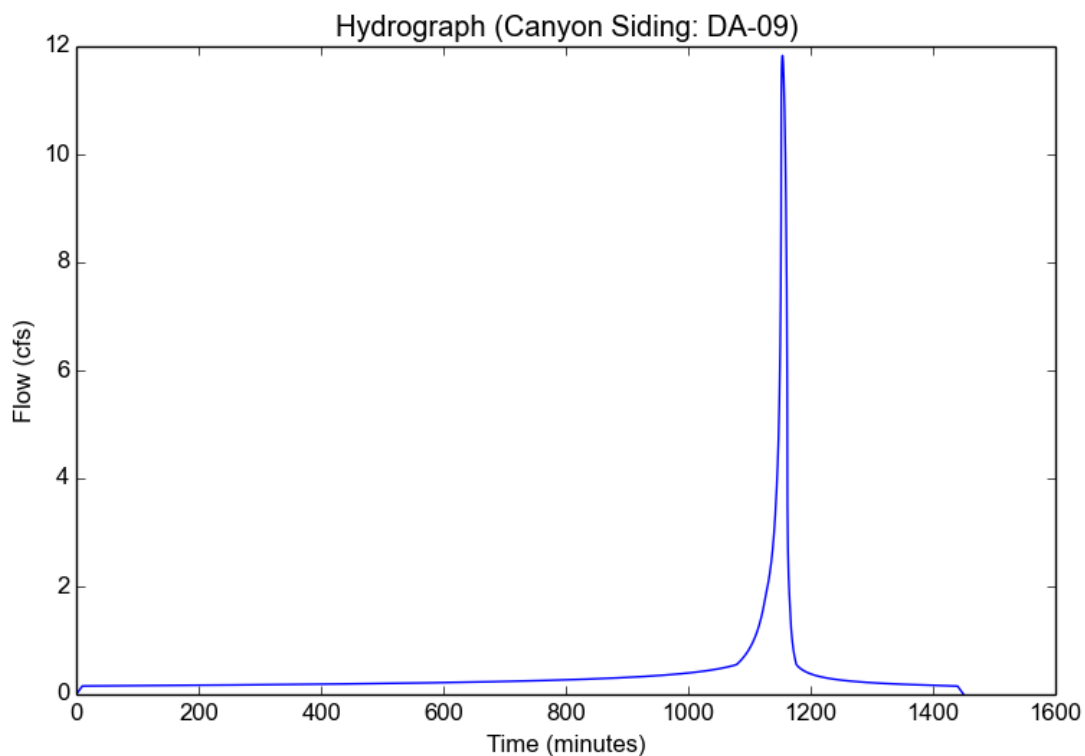
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-09
Area (ac)	10.11
Flow Path Length (ft)	1025.0
Flow Path Slope (vft/hft)	0.202
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.087673207
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.7609
Undeveloped Runoff Coefficient (Cu)	0.6419
Developed Runoff Coefficient (Cd)	0.6645
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	11.8302
Burned Peak Flow Rate (cfs)	11.8302
24-Hr Clear Runoff Volume (ac-ft)	0.7942
24-Hr Clear Runoff Volume (cu-ft)	34597.113



Peak Flow Hydrologic Analysis

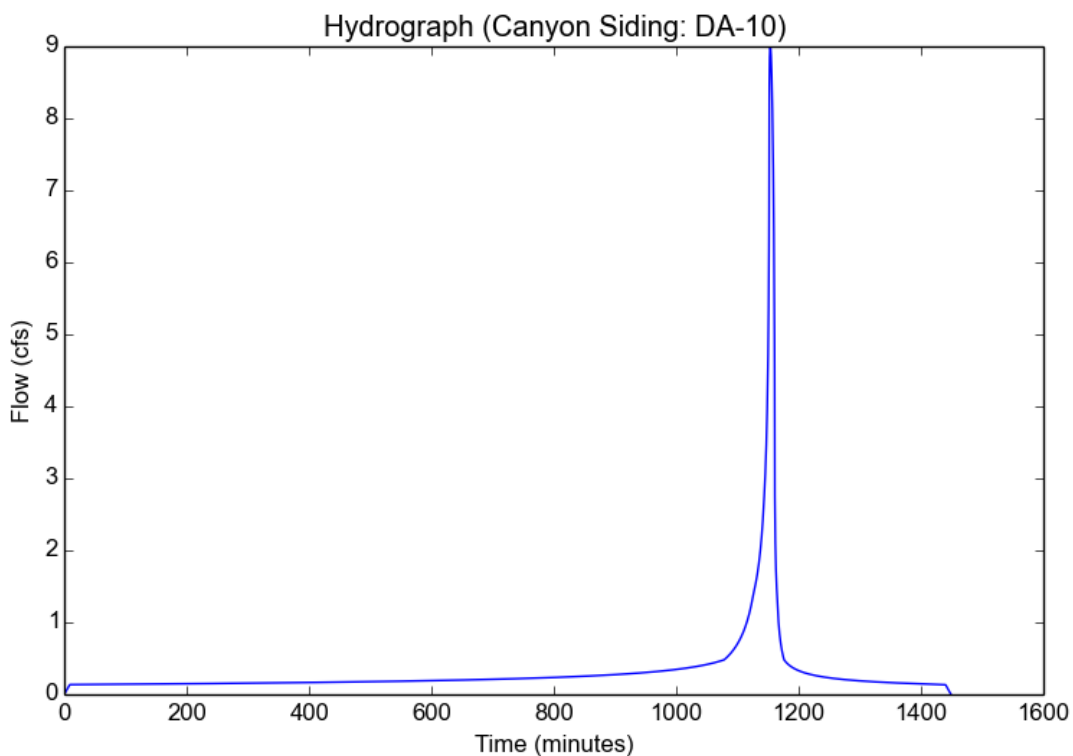
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-10
Area (ac)	7.08
Flow Path Length (ft)	887.0
Flow Path Slope (vft/hft)	0.226
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.140092863
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.8503
Undeveloped Runoff Coefficient (Cu)	0.6519
Developed Runoff Coefficient (Cd)	0.6866
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	8.9947
Burned Peak Flow Rate (cfs)	8.9947
24-Hr Clear Runoff Volume (ac-ft)	0.6483
24-Hr Clear Runoff Volume (cu-ft)	28239.0818



Peak Flow Hydrologic Analysis

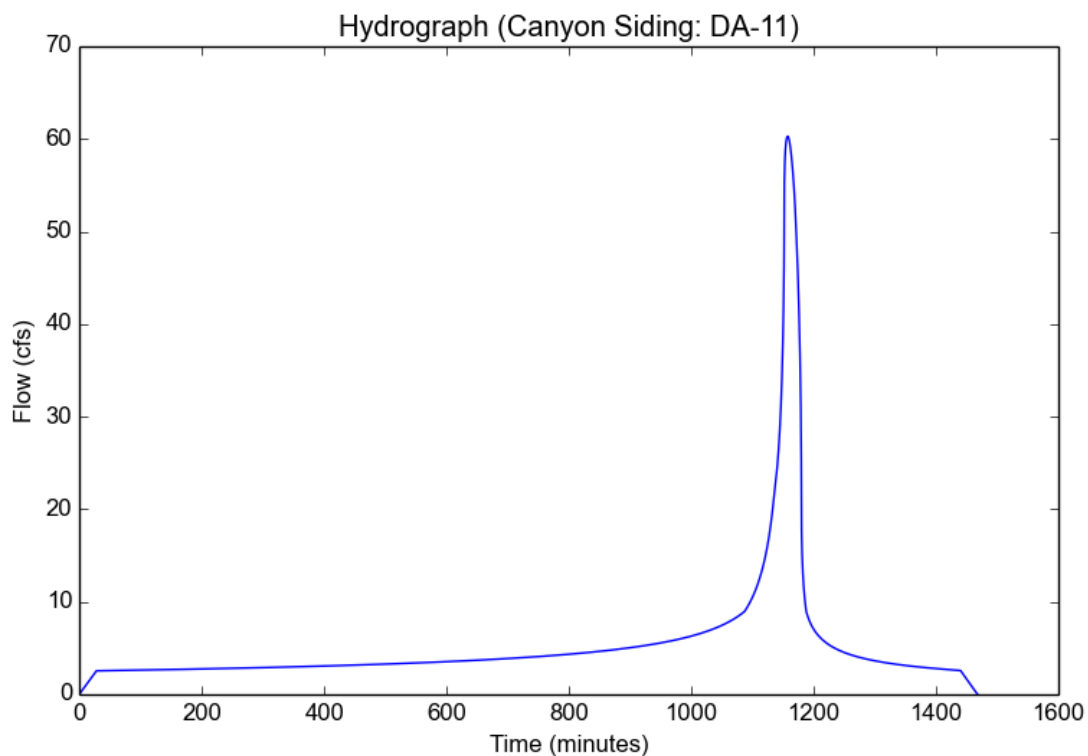
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-11
Area (ac)	87.33
Flow Path Length (ft)	4047.0
Flow Path Slope (vft/hft)	0.101
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.276140604
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.0853
Undeveloped Runoff Coefficient (Cu)	0.5354
Developed Runoff Coefficient (Cd)	0.6361
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	60.2908
Burned Peak Flow Rate (cfs)	60.2908
24-Hr Clear Runoff Volume (ac-ft)	10.8749
24-Hr Clear Runoff Volume (cu-ft)	473712.7921



Peak Flow Hydrologic Analysis

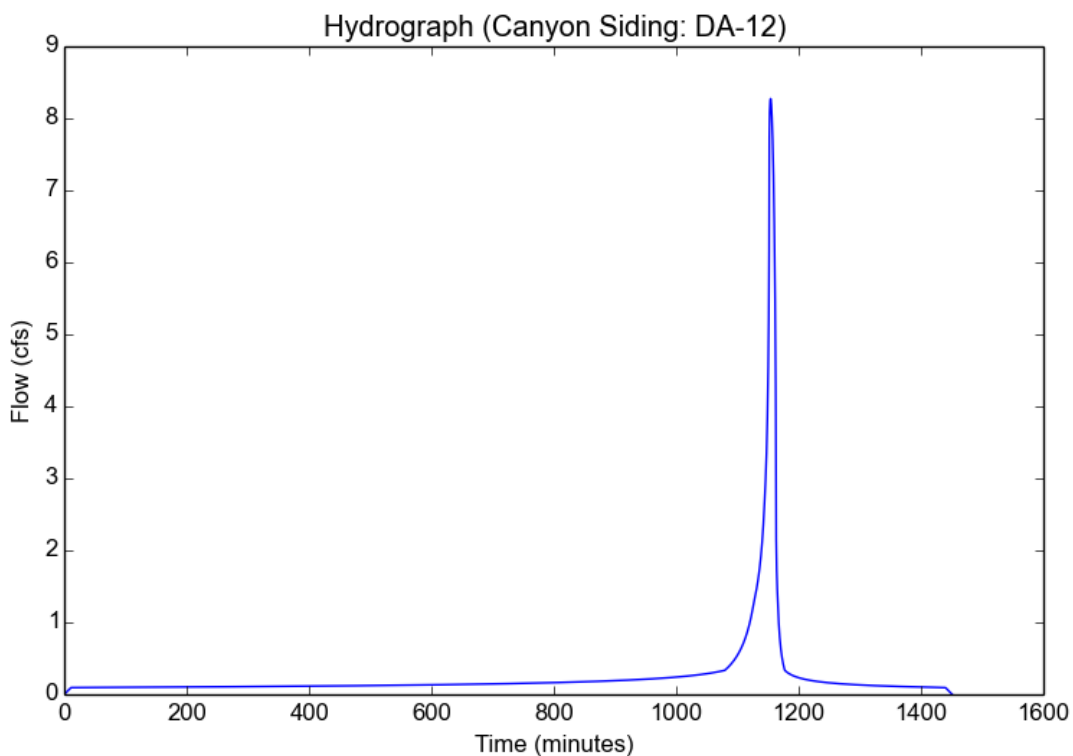
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-12
Area (ac)	7.61
Flow Path Length (ft)	1189.0
Flow Path Slope (vft/hft)	0.193
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.046514217
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.6837
Undeveloped Runoff Coefficient (Cu)	0.6333
Developed Runoff Coefficient (Cd)	0.6457
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	8.2735
Burned Peak Flow Rate (cfs)	8.2735
24-Hr Clear Runoff Volume (ac-ft)	0.5201
24-Hr Clear Runoff Volume (cu-ft)	22654.1908



Peak Flow Hydrologic Analysis

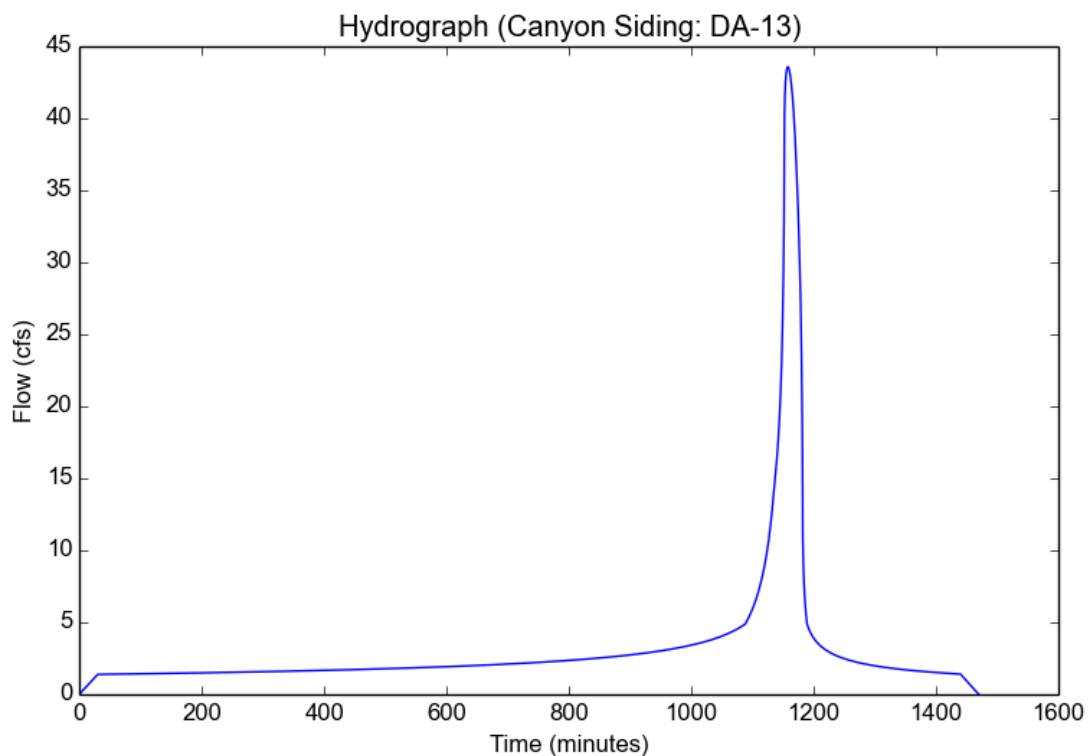
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-13
Area (ac)	71.28
Flow Path Length (ft)	4280.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.142666804
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.0507
Undeveloped Runoff Coefficient (Cu)	0.529
Developed Runoff Coefficient (Cd)	0.5819
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	43.5806
Burned Peak Flow Rate (cfs)	43.5806
24-Hr Clear Runoff Volume (ac-ft)	6.5127
24-Hr Clear Runoff Volume (cu-ft)	283694.0216



Peak Flow Hydrologic Analysis

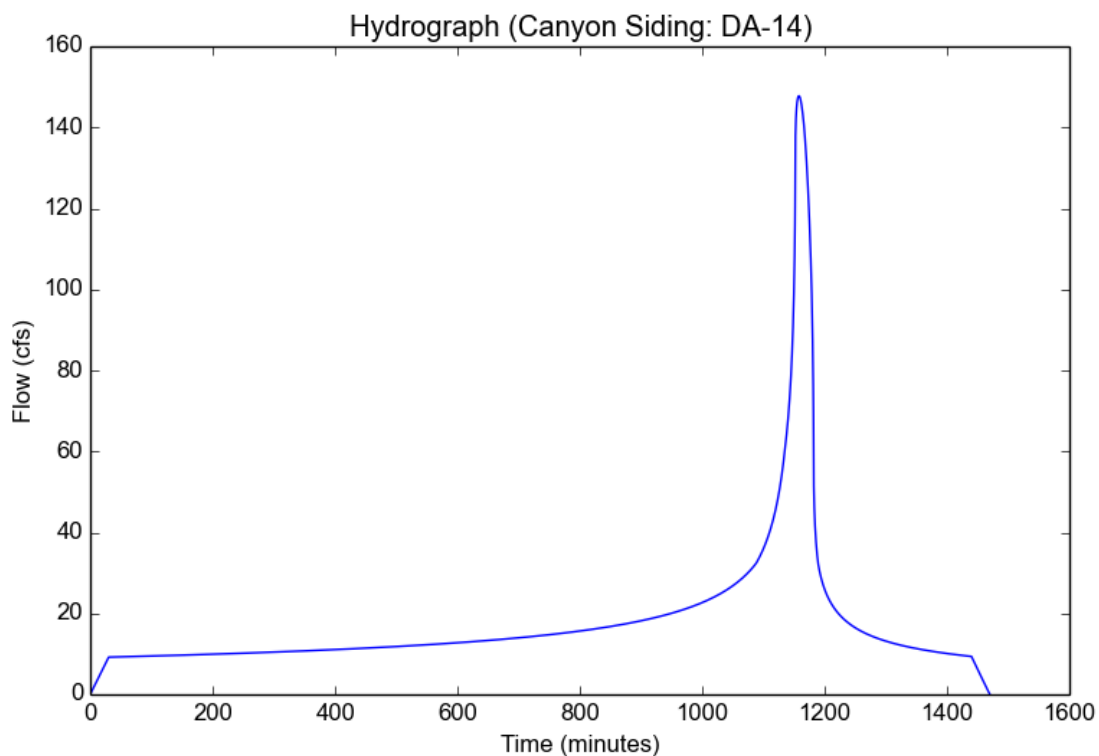
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-14
Area (ac)	194.19
Flow Path Length (ft)	6555.0
Flow Path Slope (vft/hft)	0.047
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.526484739
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.0507
Undeveloped Runoff Coefficient (Cu)	0.529
Developed Runoff Coefficient (Cd)	0.7243
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	147.7854
Burned Peak Flow Rate (cfs)	147.7854
24-Hr Clear Runoff Volume (ac-ft)	36.2343
24-Hr Clear Runoff Volume (cu-ft)	1578366.5766



Peak Flow Hydrologic Analysis

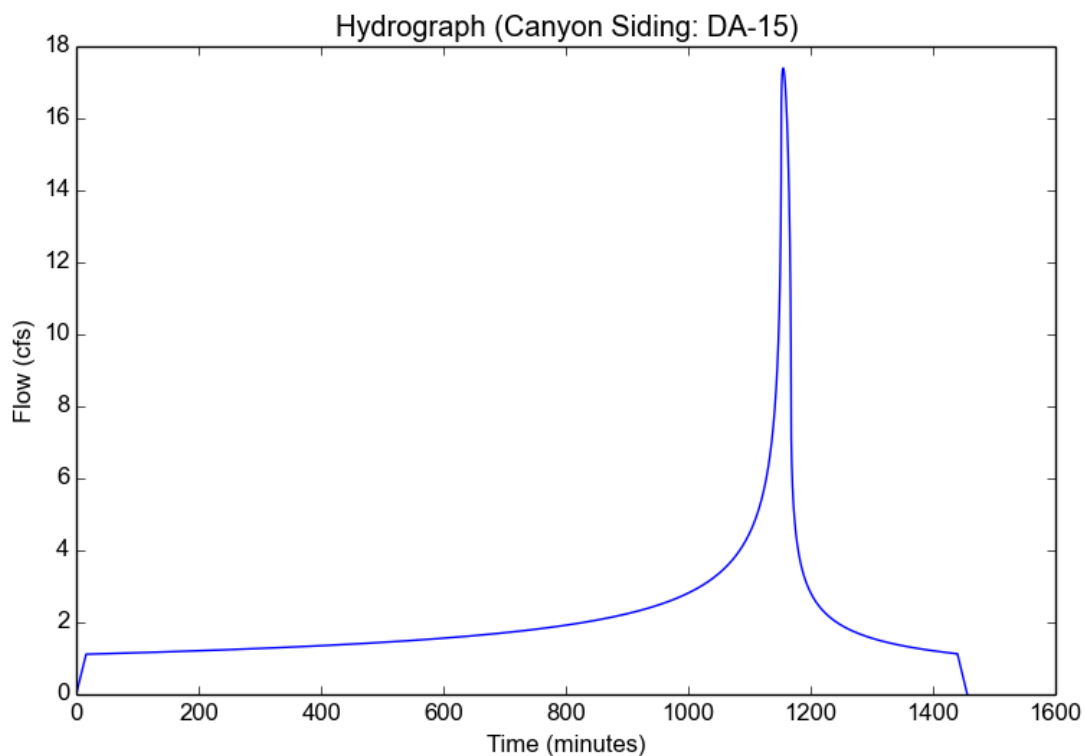
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-15
Area (ac)	13.69
Flow Path Length (ft)	2174.0
Flow Path Slope (vft/hft)	0.069
50-yr Rainfall Depth (in)	7.0
Percent Impervious	1.0
Soil Type	97
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	4.088
Peak Intensity (in/hr)	1.4119
Undeveloped Runoff Coefficient (Cu)	0.5964
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	17.3956
Burned Peak Flow Rate (cfs)	17.3956
24-Hr Clear Runoff Volume (ac-ft)	4.1627
24-Hr Clear Runoff Volume (cu-ft)	181326.2796



Peak Flow Hydrologic Analysis

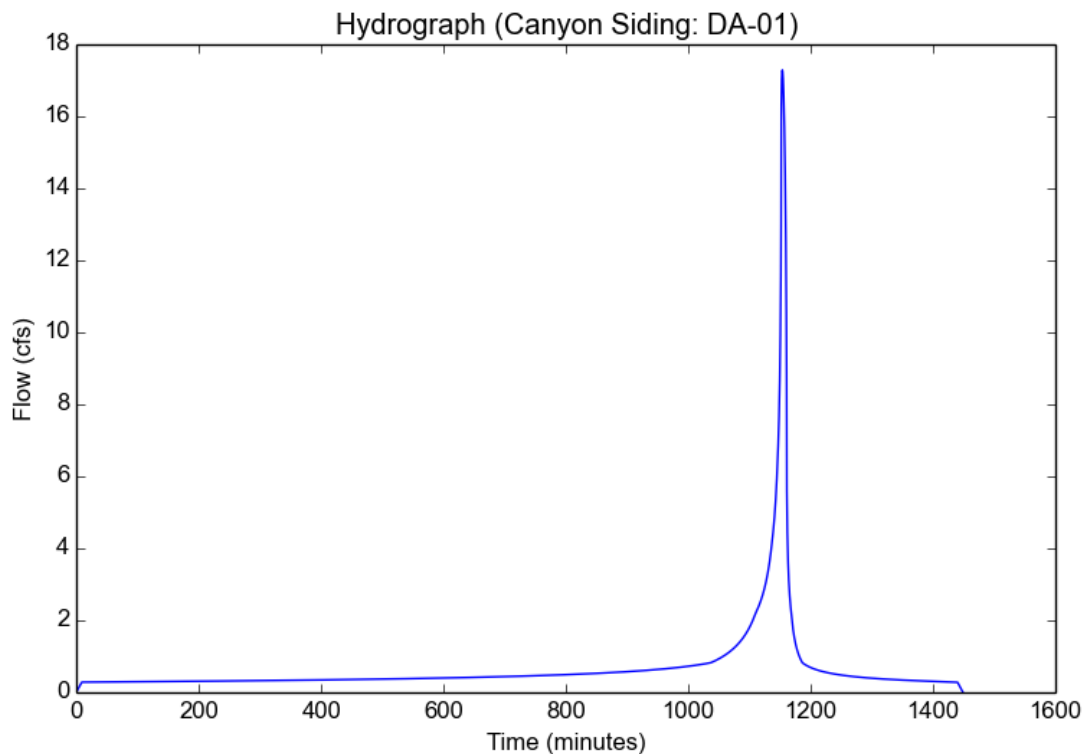
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-01
Area (ac)	10.52
Flow Path Length (ft)	976.0
Flow Path Slope (vft/hft)	0.094
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.180613567
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.2622
Undeveloped Runoff Coefficient (Cu)	0.6882
Developed Runoff Coefficient (Cd)	0.7264
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	17.2879
Burned Peak Flow Rate (cfs)	17.2879
24-Hr Clear Runoff Volume (ac-ft)	1.3711
24-Hr Clear Runoff Volume (cu-ft)	59725.7151



Peak Flow Hydrologic Analysis

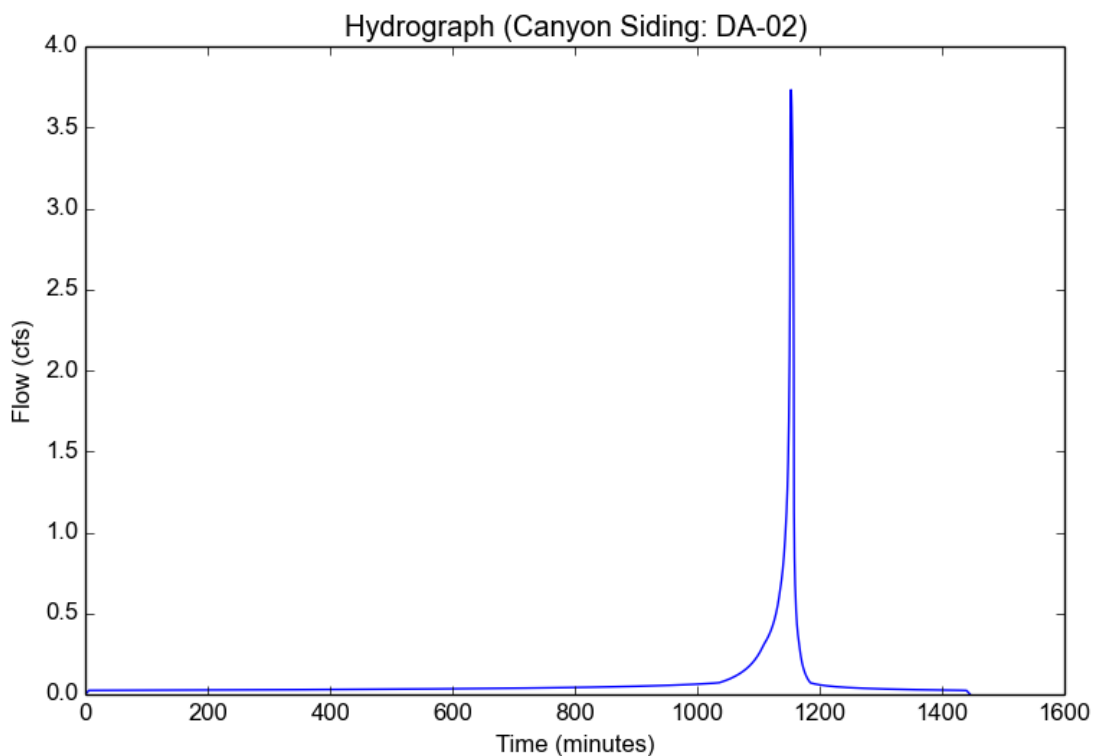
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-02
Area (ac)	1.89
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.15
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.022686757
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.7371
Undeveloped Runoff Coefficient (Cu)	0.7173
Developed Runoff Coefficient (Cd)	0.7214
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	3.7319
Burned Peak Flow Rate (cfs)	3.7319
24-Hr Clear Runoff Volume (ac-ft)	0.1587
24-Hr Clear Runoff Volume (cu-ft)	6912.7603



Peak Flow Hydrologic Analysis

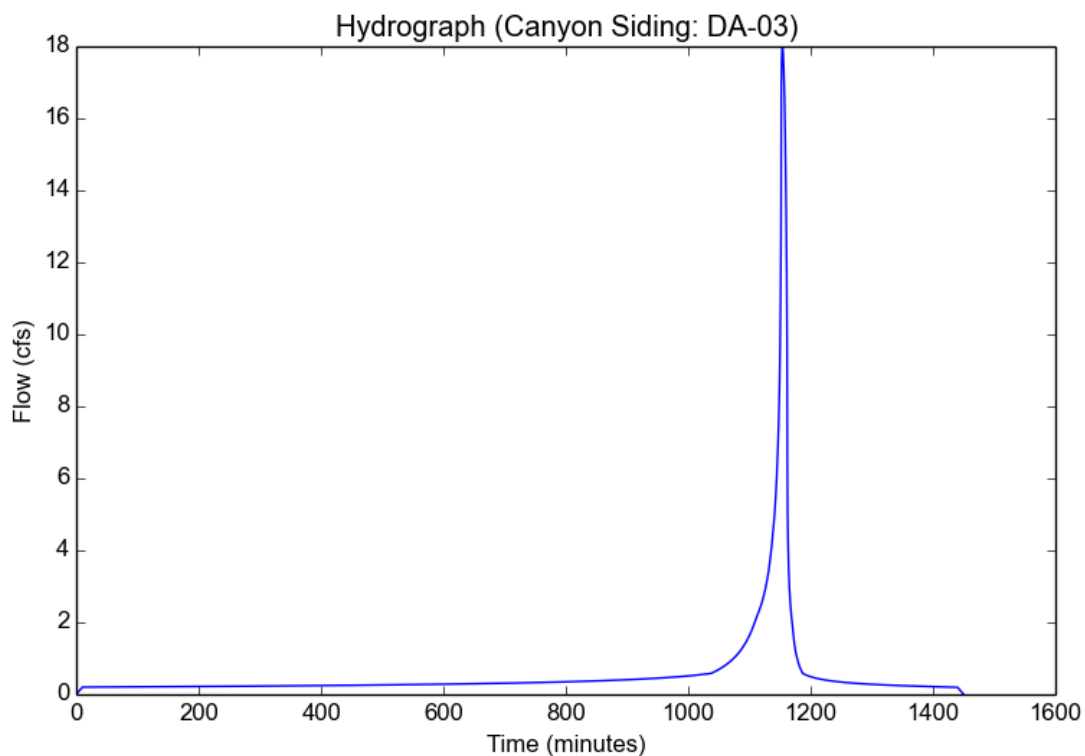
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-03
Area (ac)	12.03
Flow Path Length (ft)	1176.0
Flow Path Slope (vft/hft)	0.109
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.064263505
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.1529
Undeveloped Runoff Coefficient (Cu)	0.68
Developed Runoff Coefficient (Cd)	0.6941
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	17.9775
Burned Peak Flow Rate (cfs)	17.9775
24-Hr Clear Runoff Volume (ac-ft)	1.1549
24-Hr Clear Runoff Volume (cu-ft)	50309.1806



Peak Flow Hydrologic Analysis

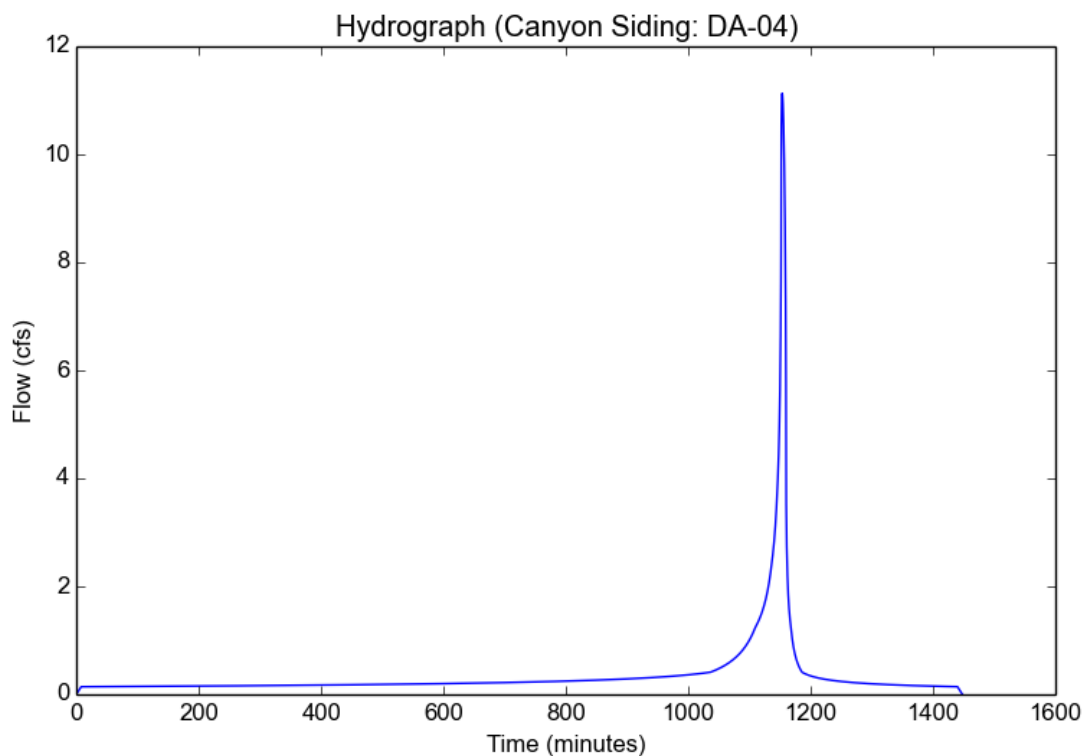
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-04
Area (ac)	6.44
Flow Path Length (ft)	927.0
Flow Path Slope (vft/hft)	0.223
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.123940231
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.3909
Undeveloped Runoff Coefficient (Cu)	0.6978
Developed Runoff Coefficient (Cd)	0.7229
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	11.1308
Burned Peak Flow Rate (cfs)	11.1308
24-Hr Clear Runoff Volume (ac-ft)	0.7322
24-Hr Clear Runoff Volume (cu-ft)	31892.4743



Peak Flow Hydrologic Analysis

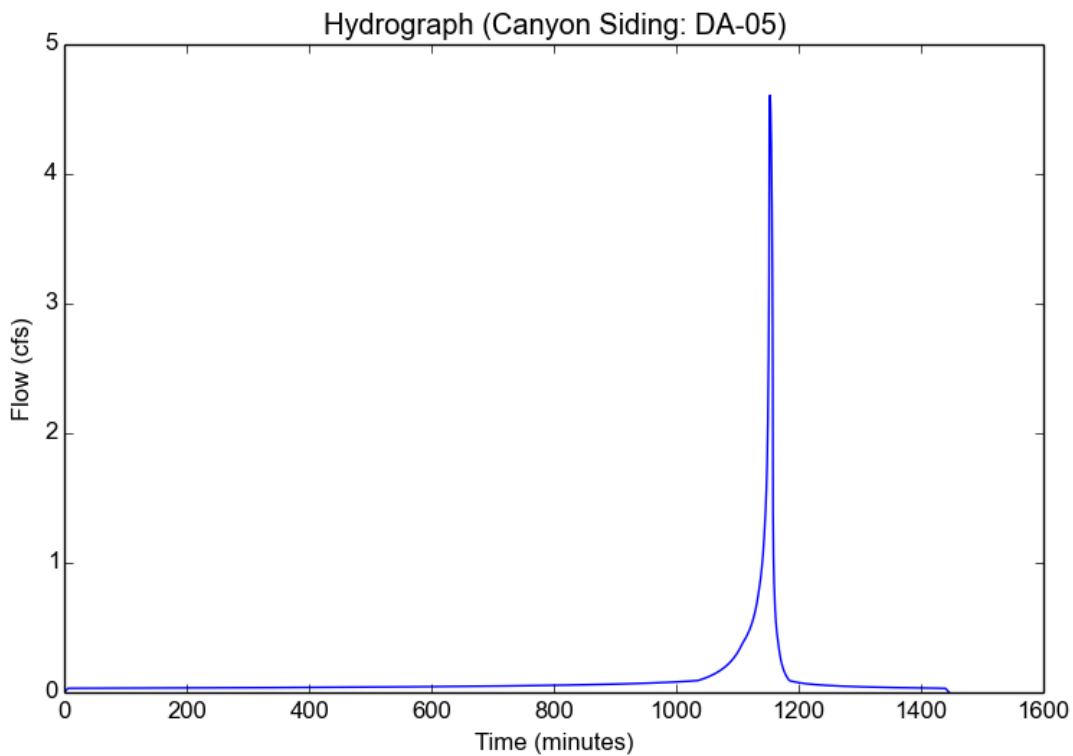
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-05
Area (ac)	2.33
Flow Path Length (ft)	622.0
Flow Path Slope (vft/hft)	0.248
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.027818059
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.7371
Undeveloped Runoff Coefficient (Cu)	0.7173
Developed Runoff Coefficient (Cd)	0.7224
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	4.6067
Burned Peak Flow Rate (cfs)	4.6067
24-Hr Clear Runoff Volume (ac-ft)	0.1992
24-Hr Clear Runoff Volume (cu-ft)	8675.4387



Peak Flow Hydrologic Analysis

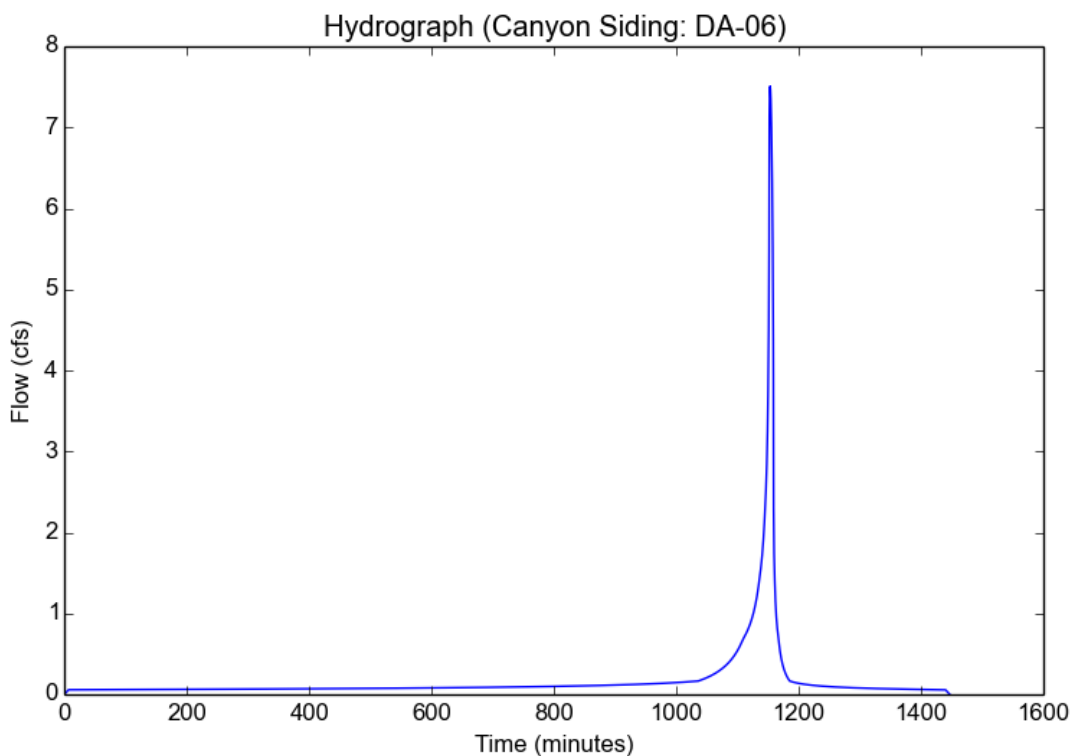
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-06
Area (ac)	4.13
Flow Path Length (ft)	792.0
Flow Path Slope (vft/hft)	0.24
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.030867097
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.5458
Undeveloped Runoff Coefficient (Cu)	0.7082
Developed Runoff Coefficient (Cd)	0.7141
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	7.5082
Burned Peak Flow Rate (cfs)	7.5082
24-Hr Clear Runoff Volume (ac-ft)	0.3566
24-Hr Clear Runoff Volume (cu-ft)	15532.2017



Peak Flow Hydrologic Analysis

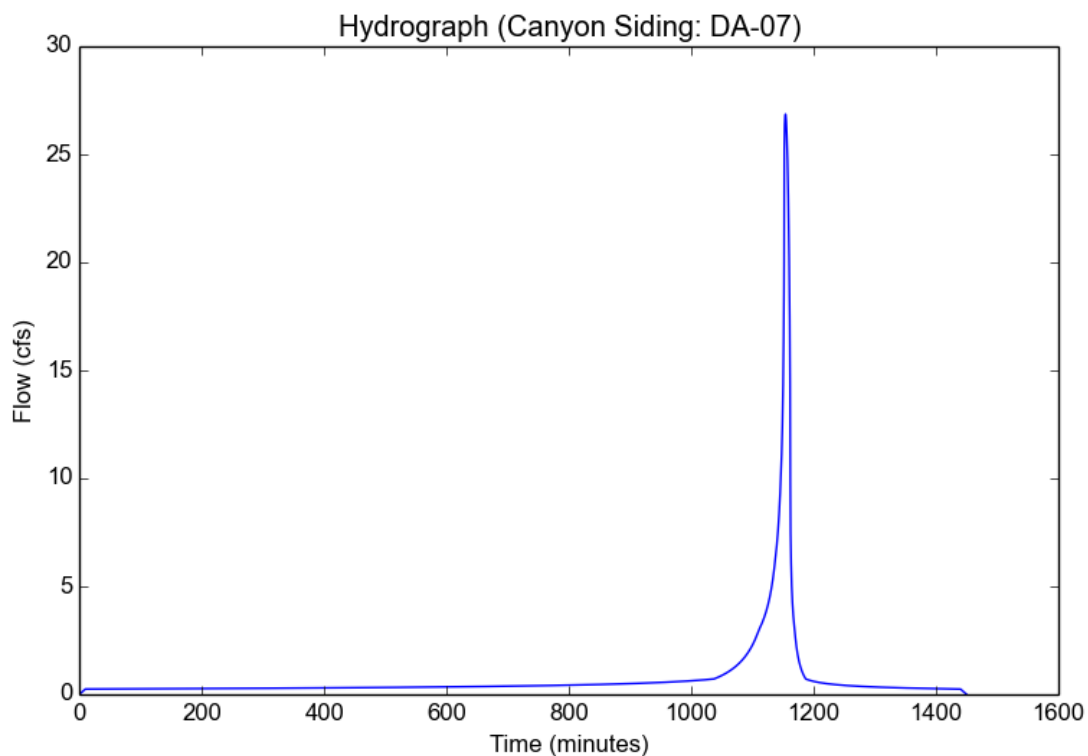
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-07
Area (ac)	18.18
Flow Path Length (ft)	1244.0
Flow Path Slope (vft/hft)	0.208
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.028608006
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.1529
Undeveloped Runoff Coefficient (Cu)	0.68
Developed Runoff Coefficient (Cd)	0.6863
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	26.861
Burned Peak Flow Rate (cfs)	26.861
24-Hr Clear Runoff Volume (ac-ft)	1.5544
24-Hr Clear Runoff Volume (cu-ft)	67707.513



Peak Flow Hydrologic Analysis

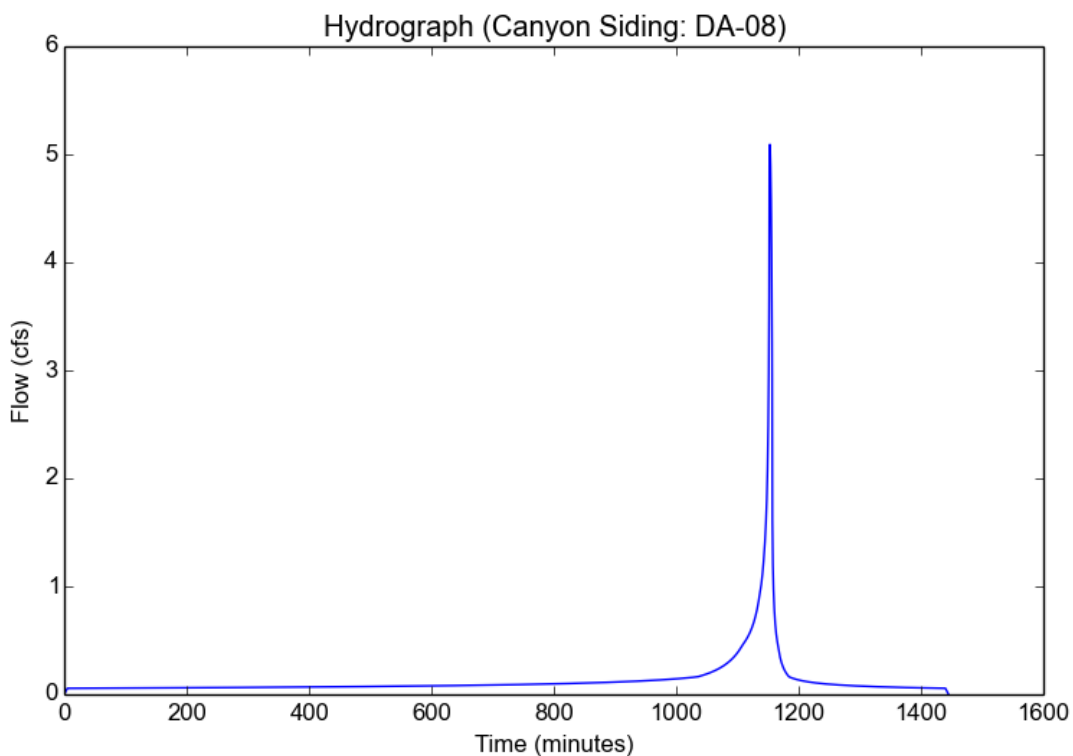
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-08
Area (ac)	2.26
Flow Path Length (ft)	472.0
Flow Path Slope (vft/hft)	0.438
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.156010454
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.9819
Undeveloped Runoff Coefficient (Cu)	0.7289
Developed Runoff Coefficient (Cd)	0.7556
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.0921
Burned Peak Flow Rate (cfs)	5.0921
24-Hr Clear Runoff Volume (ac-ft)	0.2786
24-Hr Clear Runoff Volume (cu-ft)	12134.4152



Peak Flow Hydrologic Analysis

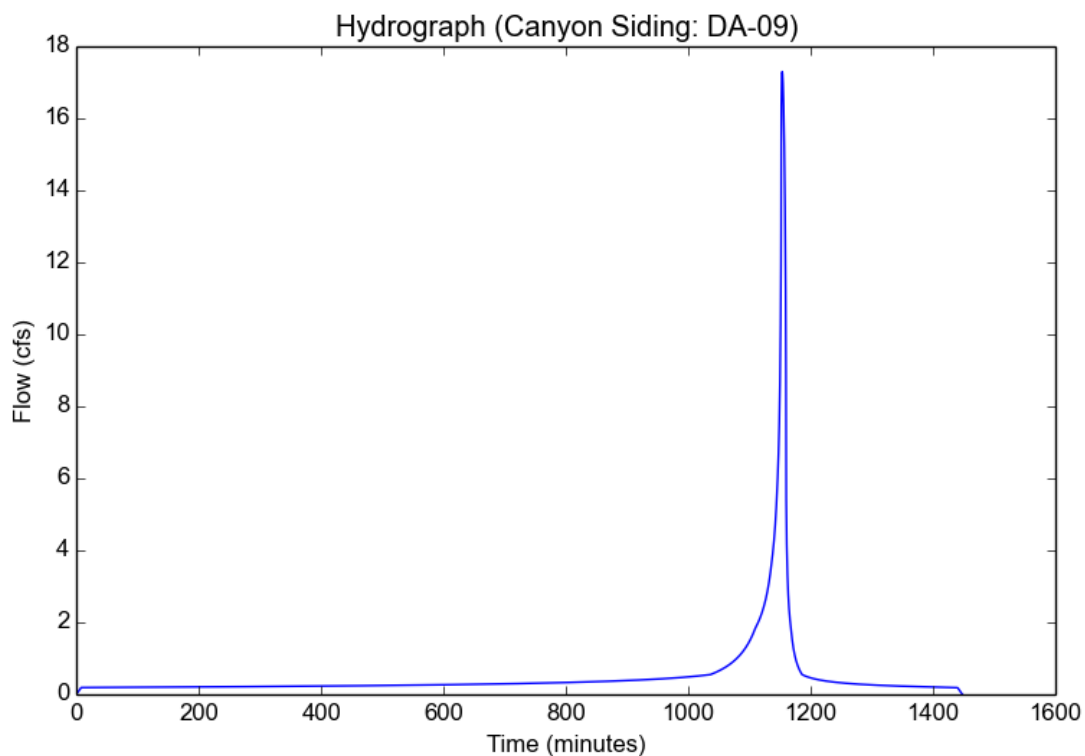
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-09
Area (ac)	10.11
Flow Path Length (ft)	1025.0
Flow Path Slope (vft/hft)	0.202
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.087673207
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.3909
Undeveloped Runoff Coefficient (Cu)	0.6978
Developed Runoff Coefficient (Cd)	0.7156
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	17.2967
Burned Peak Flow Rate (cfs)	17.2967
24-Hr Clear Runoff Volume (ac-ft)	1.0414
24-Hr Clear Runoff Volume (cu-ft)	45362.3779



Peak Flow Hydrologic Analysis

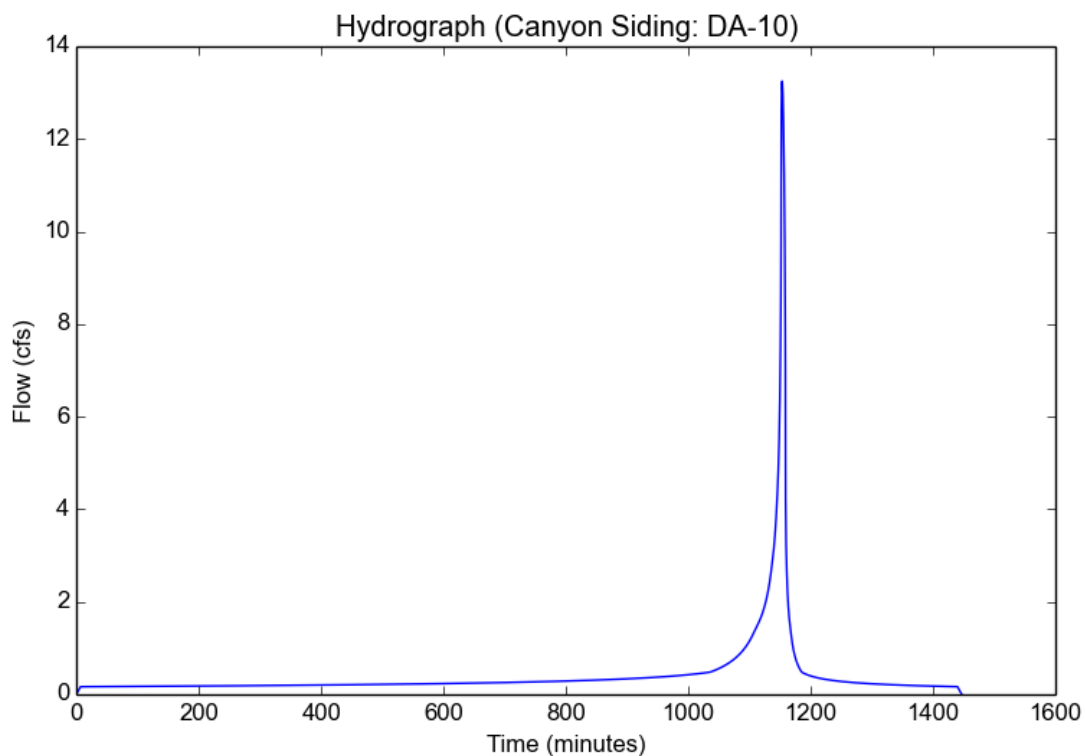
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-10
Area (ac)	7.08
Flow Path Length (ft)	887.0
Flow Path Slope (vft/hft)	0.226
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.140092863
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.5458
Undeveloped Runoff Coefficient (Cu)	0.7082
Developed Runoff Coefficient (Cd)	0.7351
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	13.2488
Burned Peak Flow Rate (cfs)	13.2488
24-Hr Clear Runoff Volume (ac-ft)	0.839
24-Hr Clear Runoff Volume (cu-ft)	36547.2944



Peak Flow Hydrologic Analysis

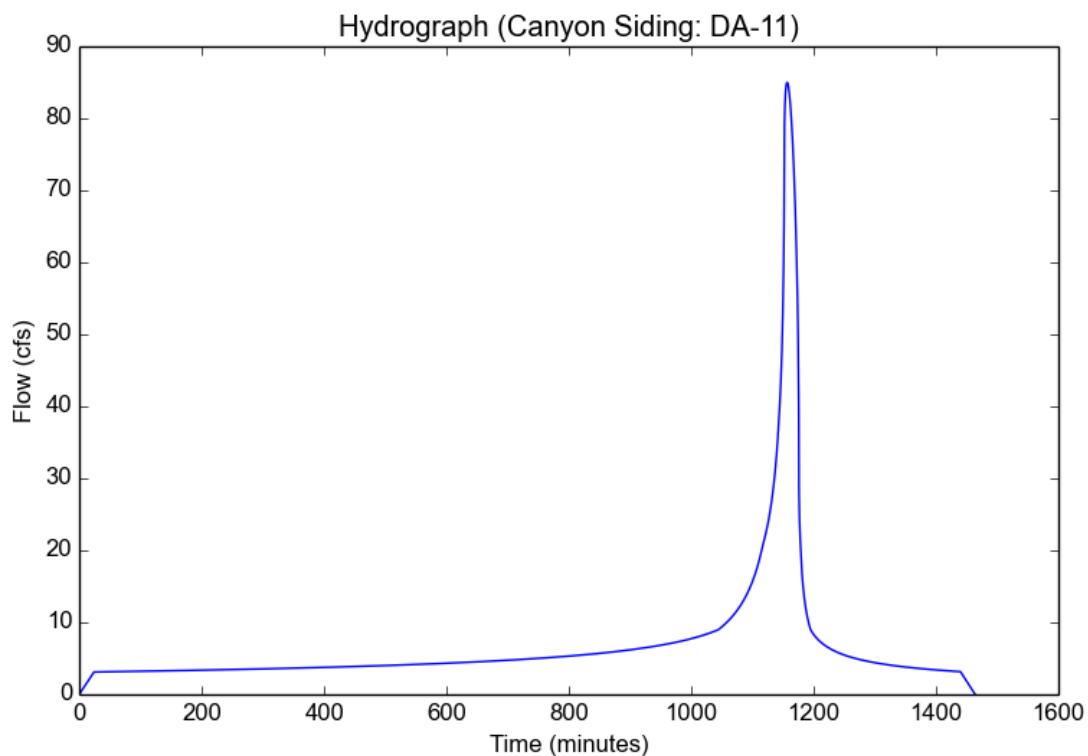
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-11
Area (ac)	87.33
Flow Path Length (ft)	4047.0
Flow Path Slope (vft/hft)	0.101
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.276140604
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	1.4266
Undeveloped Runoff Coefficient (Cu)	0.5991
Developed Runoff Coefficient (Cd)	0.6822
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	84.9954
Burned Peak Flow Rate (cfs)	84.9954
24-Hr Clear Runoff Volume (ac-ft)	13.7846
24-Hr Clear Runoff Volume (cu-ft)	600458.2238



Peak Flow Hydrologic Analysis

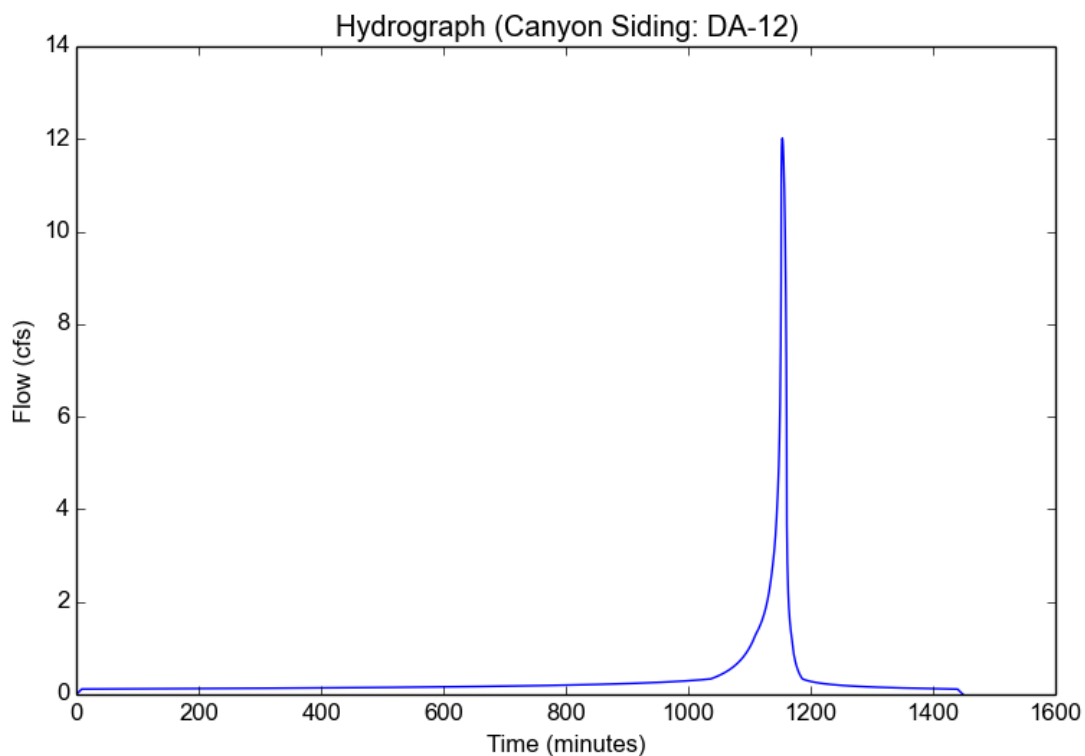
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-12
Area (ac)	7.61
Flow Path Length (ft)	1189.0
Flow Path Slope (vft/hft)	0.193
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.046514217
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	2.2622
Undeveloped Runoff Coefficient (Cu)	0.6882
Developed Runoff Coefficient (Cd)	0.698
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	12.0168
Burned Peak Flow Rate (cfs)	12.0168
24-Hr Clear Runoff Volume (ac-ft)	0.6912
24-Hr Clear Runoff Volume (cu-ft)	30107.3559



Peak Flow Hydrologic Analysis

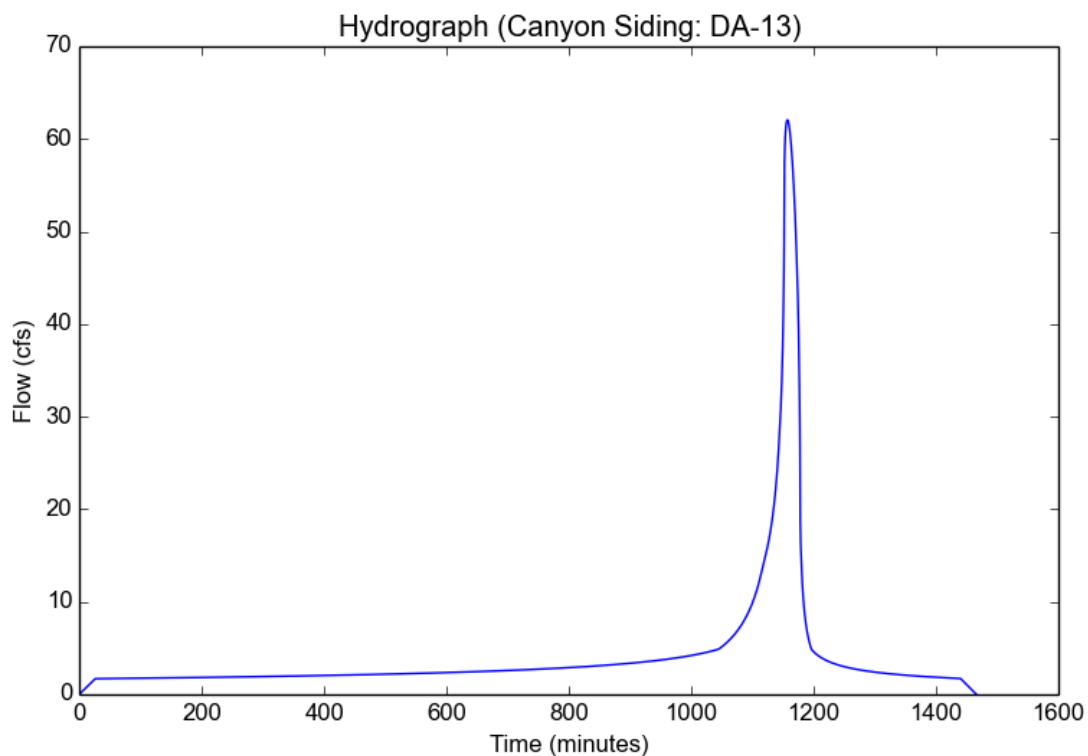
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-13
Area (ac)	71.28
Flow Path Length (ft)	4280.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.142666804
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	1.374
Undeveloped Runoff Coefficient (Cu)	0.5893
Developed Runoff Coefficient (Cd)	0.6336
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	62.0546
Burned Peak Flow Rate (cfs)	62.0546
24-Hr Clear Runoff Volume (ac-ft)	8.4317
24-Hr Clear Runoff Volume (cu-ft)	367285.0617



Peak Flow Hydrologic Analysis

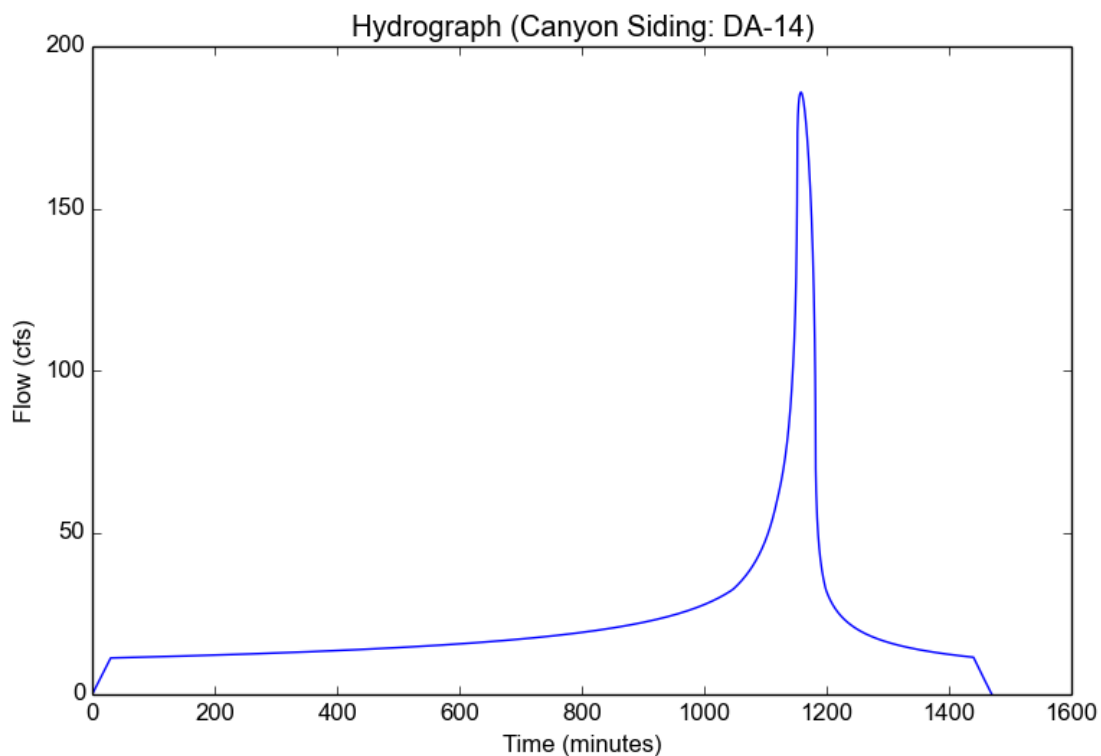
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-14
Area (ac)	194.19
Flow Path Length (ft)	6555.0
Flow Path Slope (vft/hft)	0.047
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.526484739
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	1.2846
Undeveloped Runoff Coefficient (Cu)	0.5726
Developed Runoff Coefficient (Cd)	0.745
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	185.8393
Burned Peak Flow Rate (cfs)	185.8393
24-Hr Clear Runoff Volume (ac-ft)	44.9864
24-Hr Clear Runoff Volume (cu-ft)	1959607.0008



Peak Flow Hydrologic Analysis

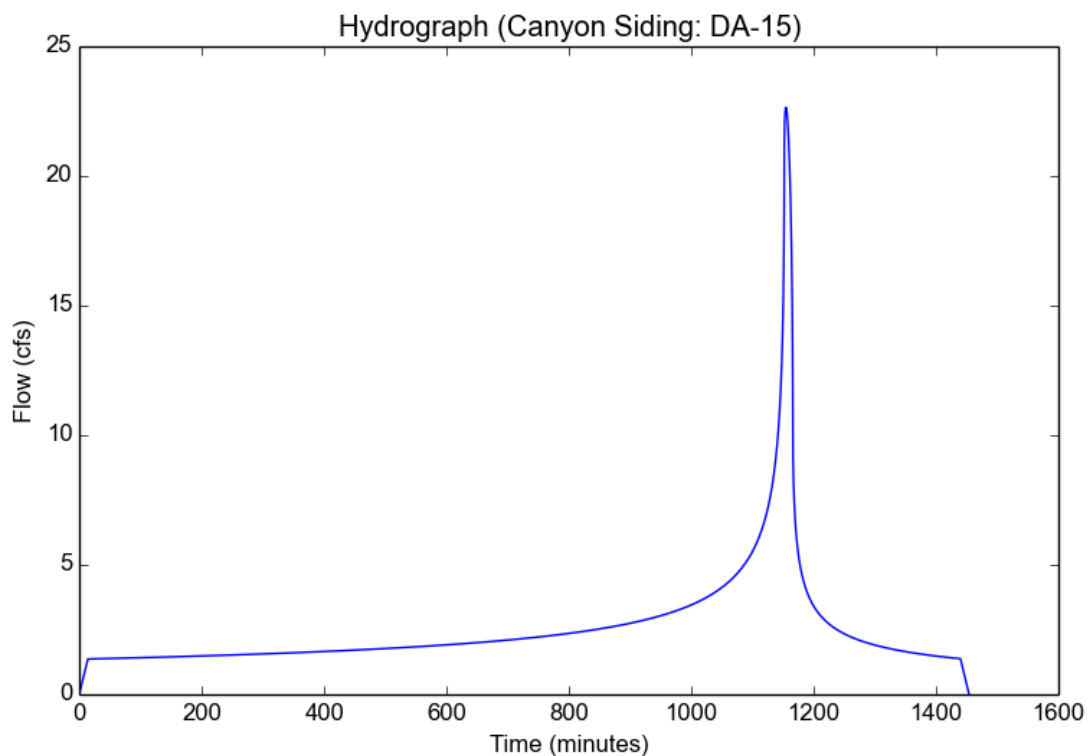
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-15
Area (ac)	13.69
Flow Path Length (ft)	2174.0
Flow Path Slope (vft/hft)	0.069
50-yr Rainfall Depth (in)	7.0
Percent Impervious	1.0
Soil Type	97
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.998
Peak Intensity (in/hr)	1.838
Undeveloped Runoff Coefficient (Cu)	0.6505
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	22.6455
Burned Peak Flow Rate (cfs)	22.6455
24-Hr Clear Runoff Volume (ac-ft)	5.0893
24-Hr Clear Runoff Volume (cu-ft)	221689.8373



Peak Flow Hydrologic Analysis

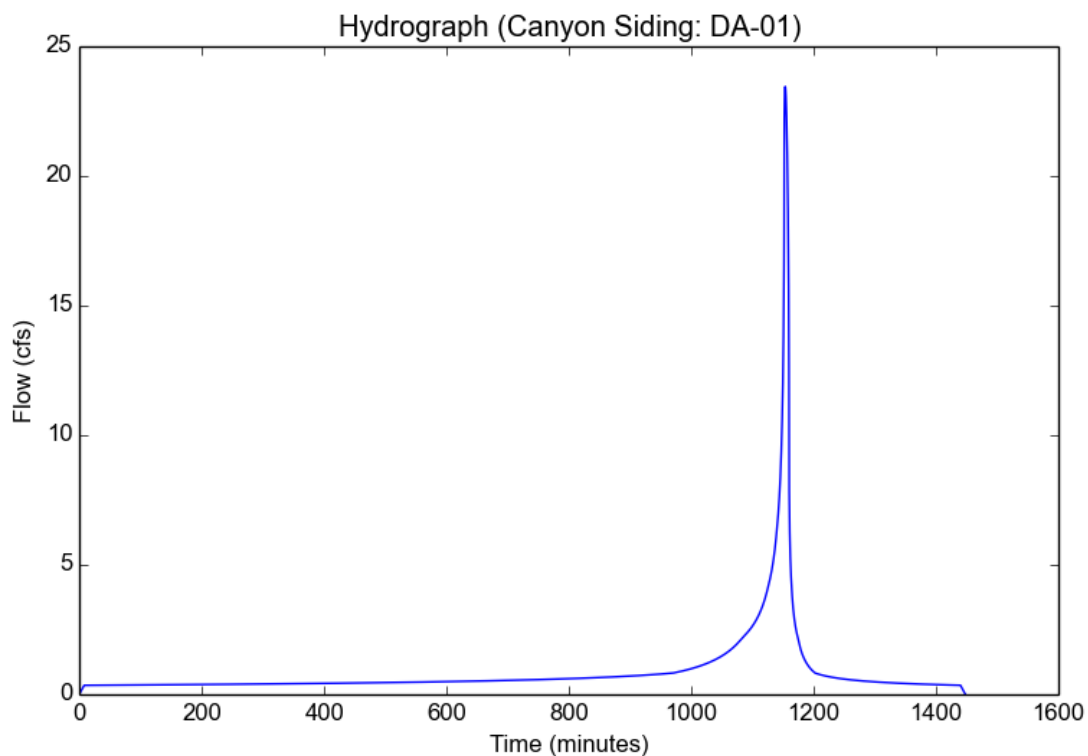
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-01
Area (ac)	10.52
Flow Path Length (ft)	976.0
Flow Path Slope (vft/hft)	0.094
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.180613567
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	2.9401
Undeveloped Runoff Coefficient (Cu)	0.7269
Developed Runoff Coefficient (Cd)	0.7582
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	23.4501
Burned Peak Flow Rate (cfs)	23.4501
24-Hr Clear Runoff Volume (ac-ft)	1.7884
24-Hr Clear Runoff Volume (cu-ft)	77903.0381



Peak Flow Hydrologic Analysis

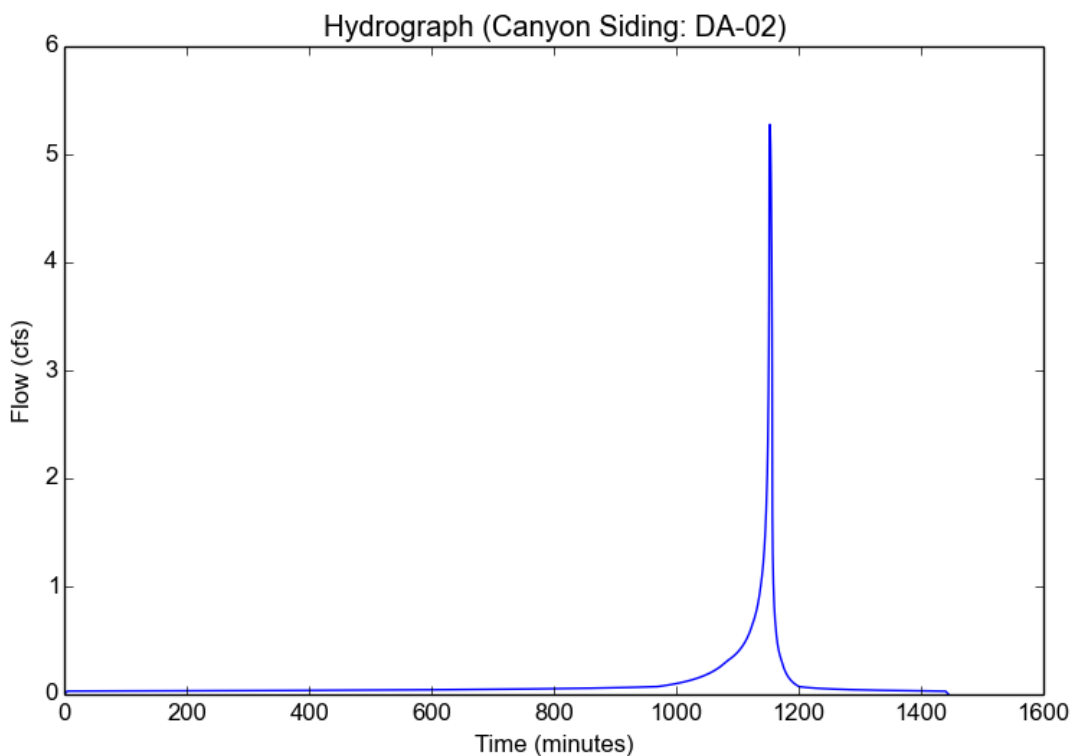
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-02
Area (ac)	1.89
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.15
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.022686757
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	3.6669
Undeveloped Runoff Coefficient (Cu)	0.7583
Developed Runoff Coefficient (Cd)	0.7615
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.2778
Burned Peak Flow Rate (cfs)	5.2778
24-Hr Clear Runoff Volume (ac-ft)	0.2171
24-Hr Clear Runoff Volume (cu-ft)	9455.7281



Peak Flow Hydrologic Analysis

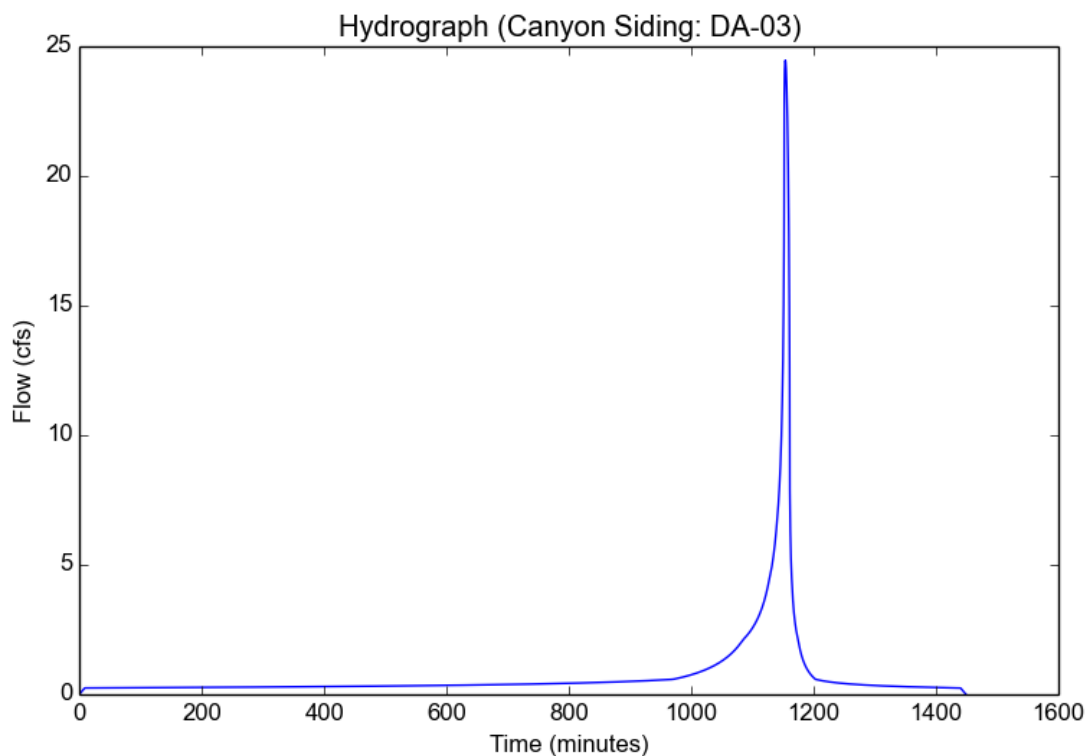
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-03
Area (ac)	12.03
Flow Path Length (ft)	1176.0
Flow Path Slope (vft/hft)	0.109
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.064263505
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	2.7817
Undeveloped Runoff Coefficient (Cu)	0.7194
Developed Runoff Coefficient (Cd)	0.731
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	24.4625
Burned Peak Flow Rate (cfs)	24.4625
24-Hr Clear Runoff Volume (ac-ft)	1.5542
24-Hr Clear Runoff Volume (cu-ft)	67698.8331



Peak Flow Hydrologic Analysis

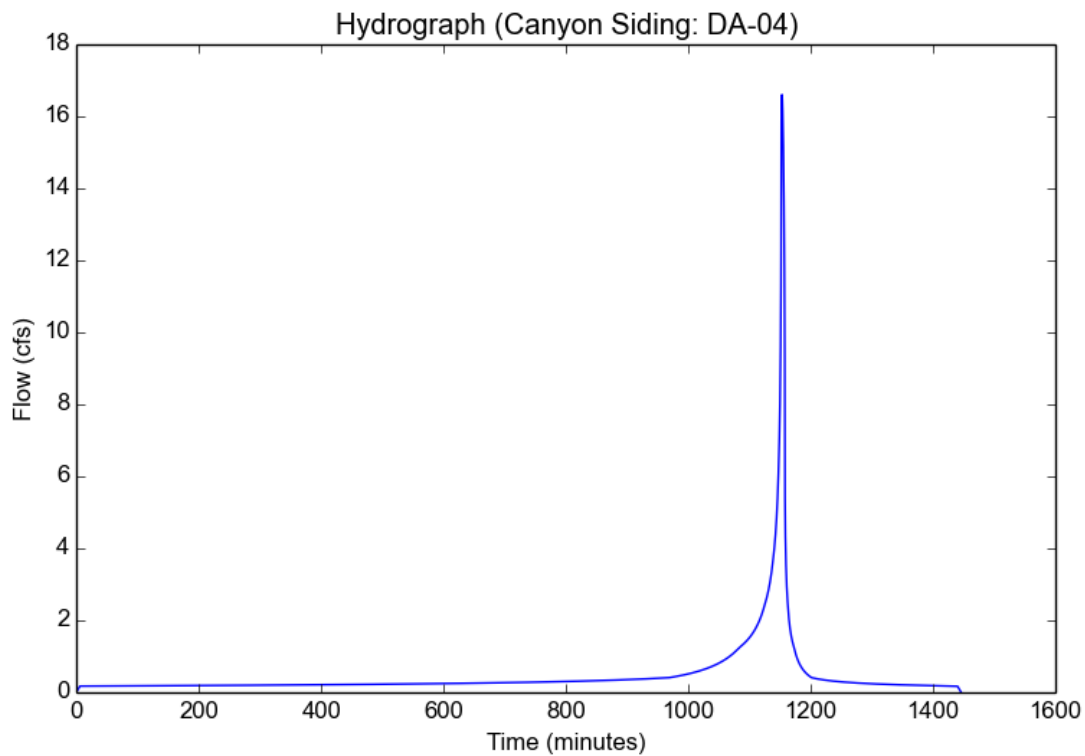
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-04
Area (ac)	6.44
Flow Path Length (ft)	927.0
Flow Path Slope (vft/hft)	0.223
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.123940231
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	3.3657
Undeveloped Runoff Coefficient (Cu)	0.7471
Developed Runoff Coefficient (Cd)	0.7661
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	16.6049
Burned Peak Flow Rate (cfs)	16.6049
24-Hr Clear Runoff Volume (ac-ft)	0.9676
24-Hr Clear Runoff Volume (cu-ft)	42149.078



Peak Flow Hydrologic Analysis

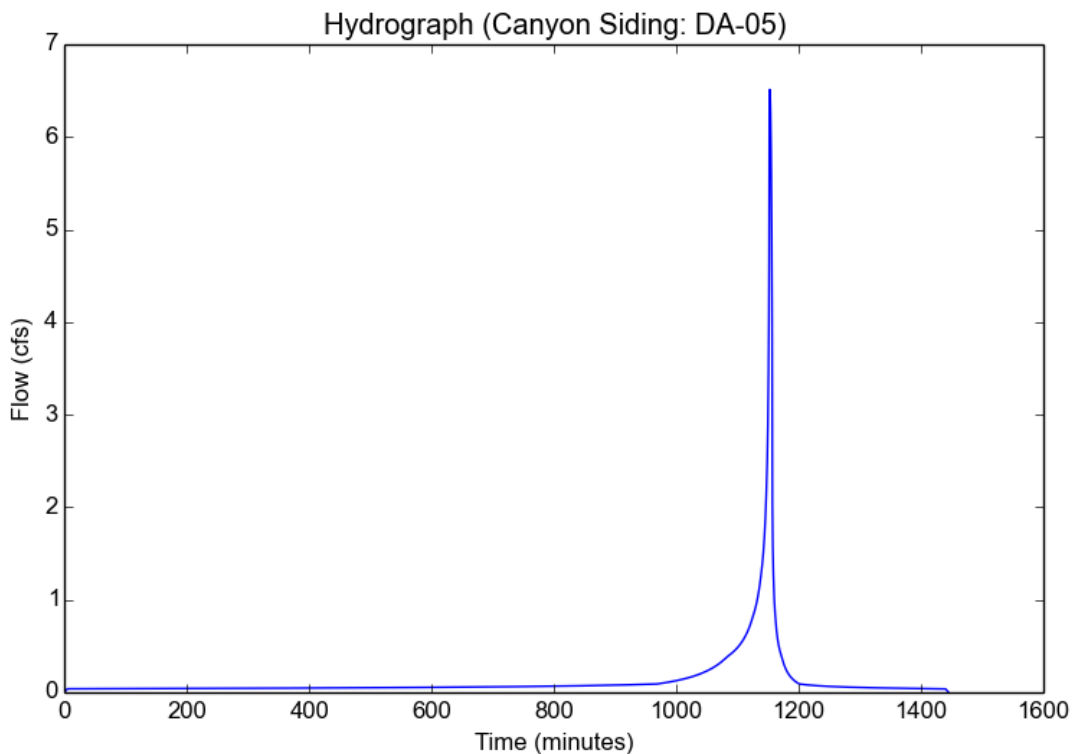
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-05
Area (ac)	2.33
Flow Path Length (ft)	622.0
Flow Path Slope (vft/hft)	0.248
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.027818059
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	3.6669
Undeveloped Runoff Coefficient (Cu)	0.7583
Developed Runoff Coefficient (Cd)	0.7623
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.5127
Burned Peak Flow Rate (cfs)	6.5127
24-Hr Clear Runoff Volume (ac-ft)	0.2718
24-Hr Clear Runoff Volume (cu-ft)	11839.4629



Peak Flow Hydrologic Analysis

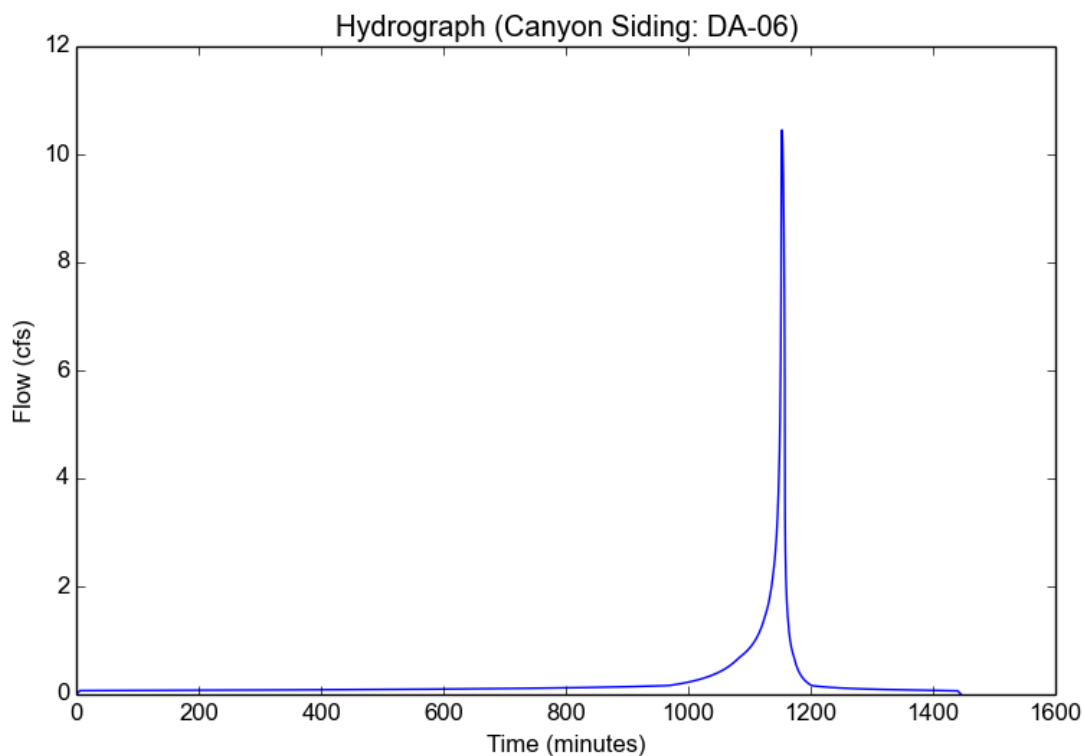
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-06
Area (ac)	4.13
Flow Path Length (ft)	792.0
Flow Path Slope (vft/hft)	0.24
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.030867097
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	3.3657
Undeveloped Runoff Coefficient (Cu)	0.7471
Developed Runoff Coefficient (Cd)	0.7518
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	10.451
Burned Peak Flow Rate (cfs)	10.451
24-Hr Clear Runoff Volume (ac-ft)	0.4859
24-Hr Clear Runoff Volume (cu-ft)	21164.7886



Peak Flow Hydrologic Analysis

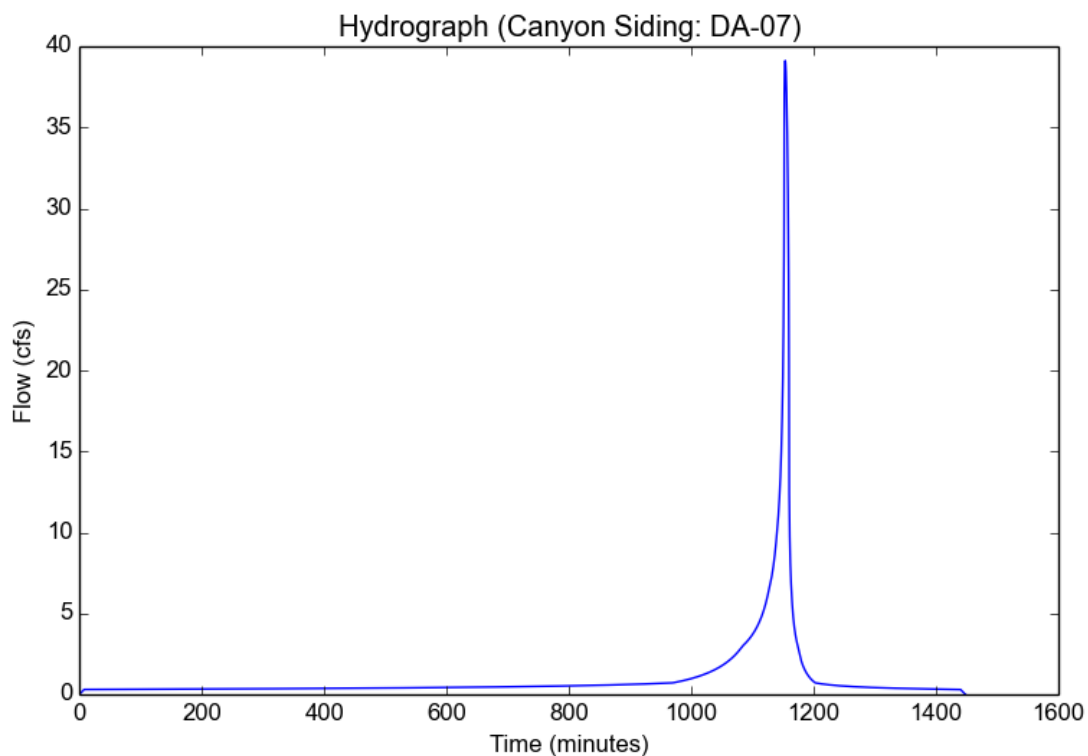
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-07
Area (ac)	18.18
Flow Path Length (ft)	1244.0
Flow Path Slope (vft/hft)	0.208
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.028608006
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	2.9401
Undeveloped Runoff Coefficient (Cu)	0.7269
Developed Runoff Coefficient (Cd)	0.7319
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	39.1186
Burned Peak Flow Rate (cfs)	39.1186
24-Hr Clear Runoff Volume (ac-ft)	2.1222
24-Hr Clear Runoff Volume (cu-ft)	92443.2494



Peak Flow Hydrologic Analysis

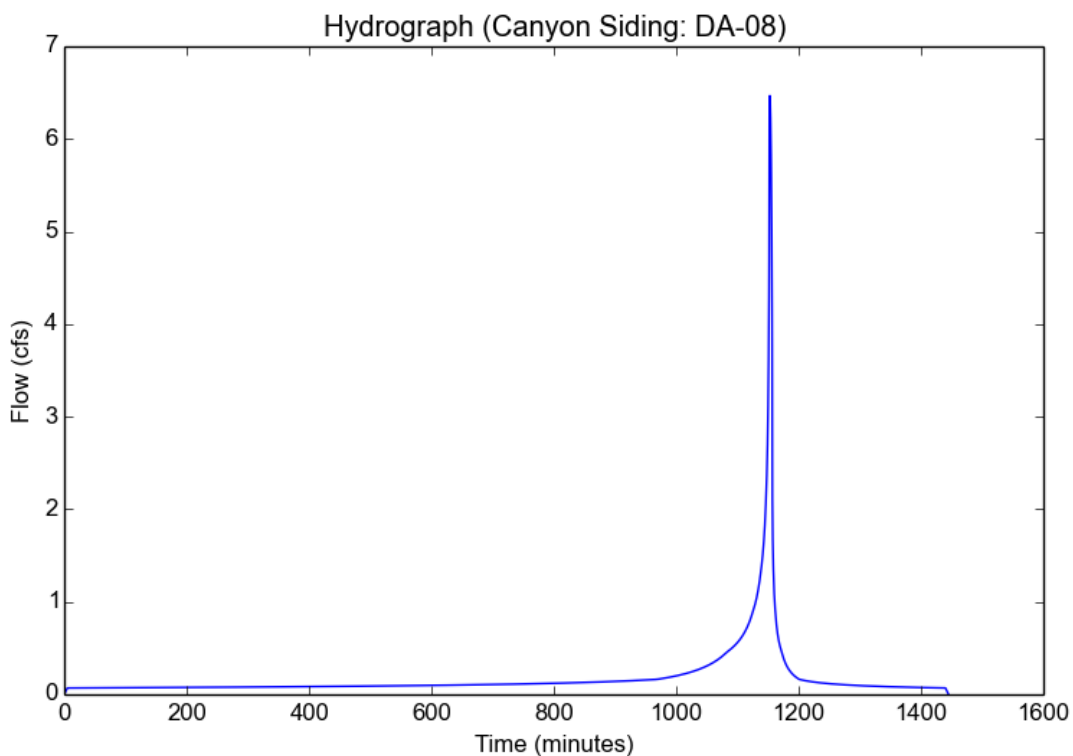
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-08
Area (ac)	2.26
Flow Path Length (ft)	472.0
Flow Path Slope (vft/hft)	0.438
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.156010454
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	3.6669
Undeveloped Runoff Coefficient (Cu)	0.7583
Developed Runoff Coefficient (Cd)	0.7804
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.4676
Burned Peak Flow Rate (cfs)	6.4676
24-Hr Clear Runoff Volume (ac-ft)	0.3651
24-Hr Clear Runoff Volume (cu-ft)	15903.697



Peak Flow Hydrologic Analysis

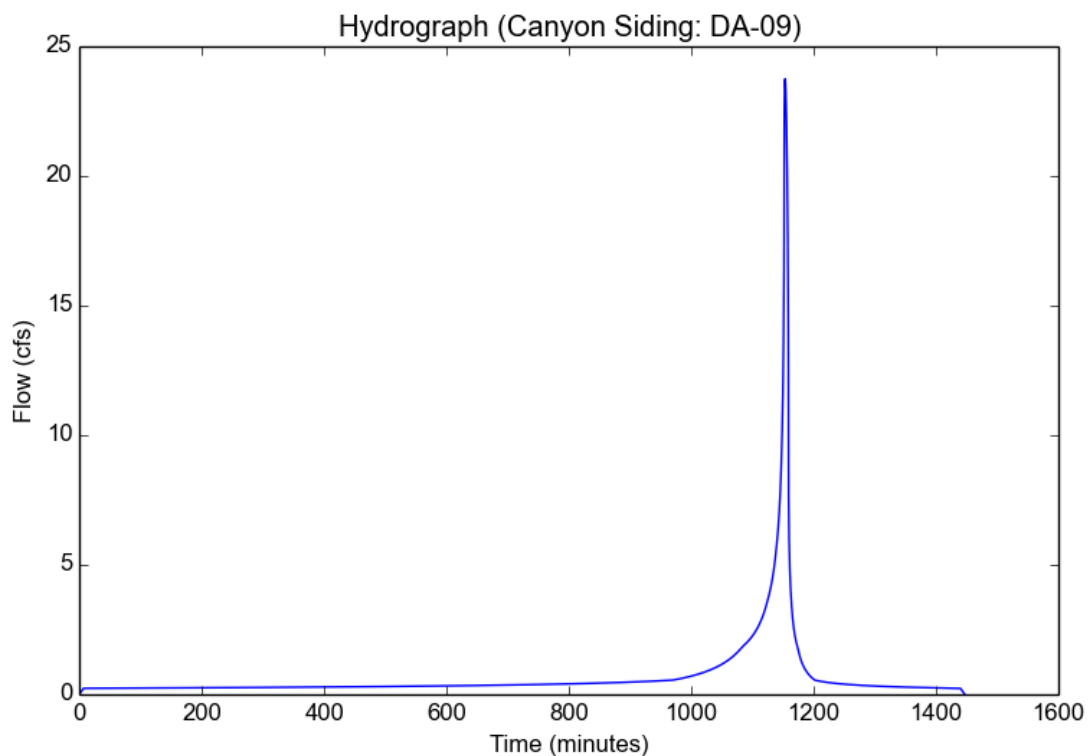
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-09
Area (ac)	10.11
Flow Path Length (ft)	1025.0
Flow Path Slope (vft/hft)	0.202
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.087673207
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	3.1305
Undeveloped Runoff Coefficient (Cu)	0.736
Developed Runoff Coefficient (Cd)	0.7503
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	23.7478
Burned Peak Flow Rate (cfs)	23.7478
24-Hr Clear Runoff Volume (ac-ft)	1.3899
24-Hr Clear Runoff Volume (cu-ft)	60545.0807



Peak Flow Hydrologic Analysis

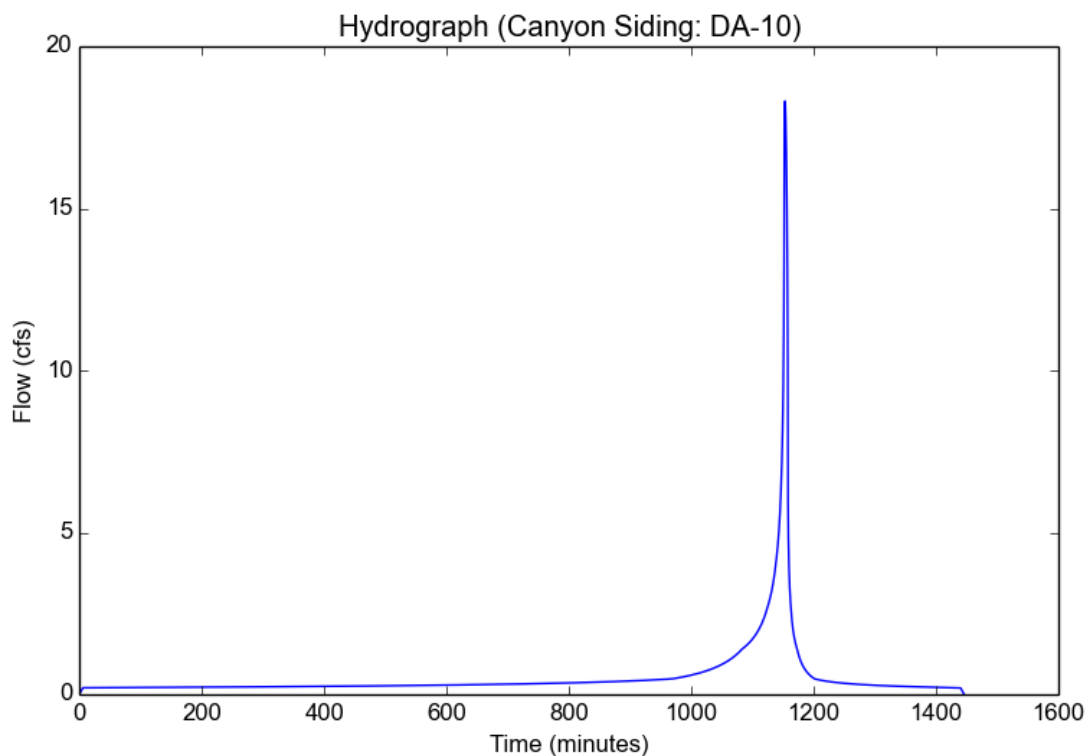
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-10
Area (ac)	7.08
Flow Path Length (ft)	887.0
Flow Path Slope (vft/hft)	0.226
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.140092863
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	3.3657
Undeveloped Runoff Coefficient (Cu)	0.7471
Developed Runoff Coefficient (Cd)	0.7685
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	18.3139
Burned Peak Flow Rate (cfs)	18.3139
24-Hr Clear Runoff Volume (ac-ft)	1.1038
24-Hr Clear Runoff Volume (cu-ft)	48082.8828



Peak Flow Hydrologic Analysis

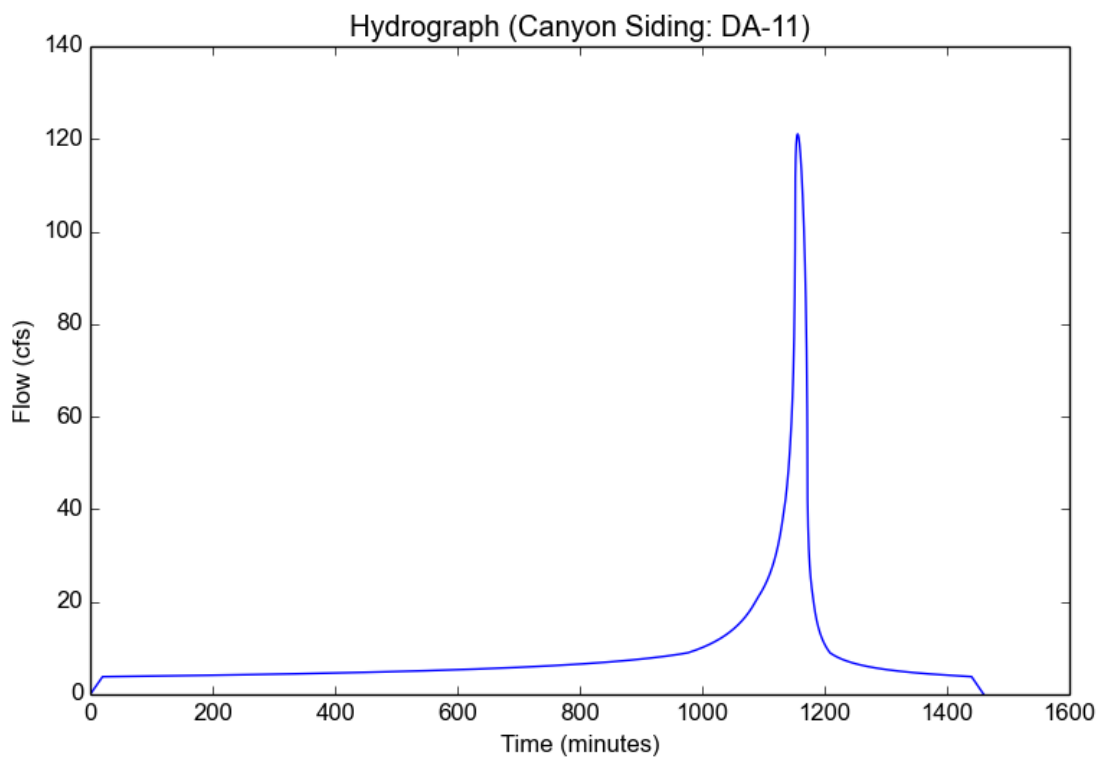
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-11
Area (ac)	87.33
Flow Path Length (ft)	4047.0
Flow Path Slope (vft/hft)	0.101
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.276140604
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	1.9113
Undeveloped Runoff Coefficient (Cu)	0.6587
Developed Runoff Coefficient (Cd)	0.7253
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	121.063
Burned Peak Flow Rate (cfs)	121.063
24-Hr Clear Runoff Volume (ac-ft)	17.727
24-Hr Clear Runoff Volume (cu-ft)	772186.958



Peak Flow Hydrologic Analysis

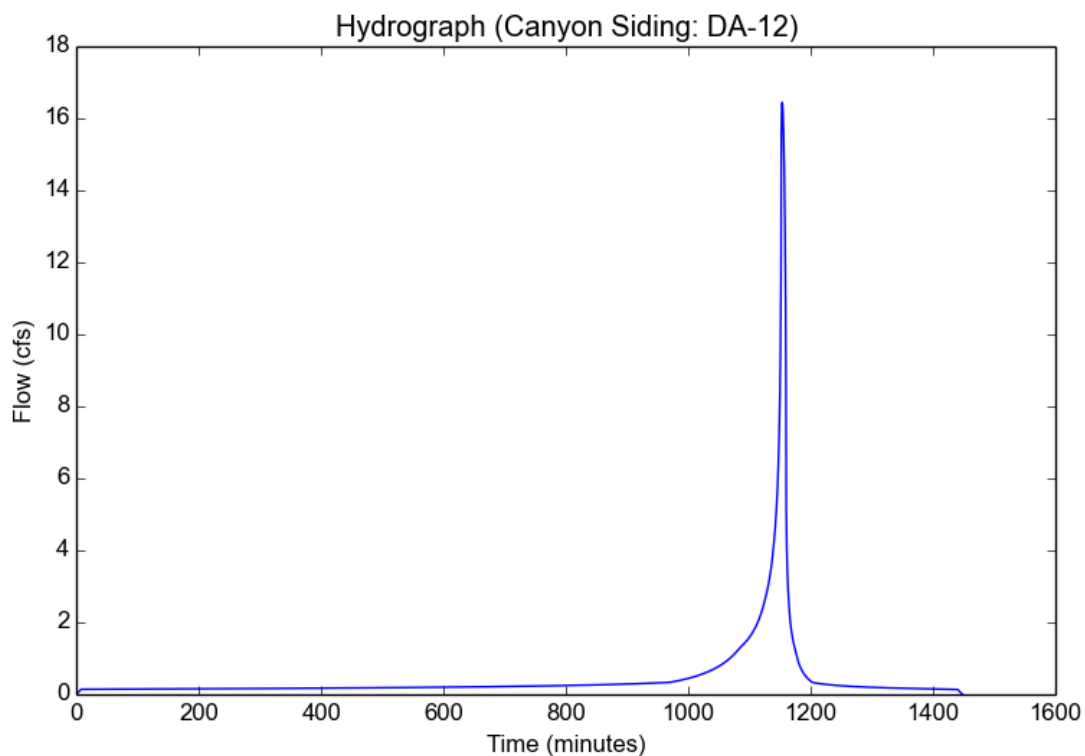
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-12
Area (ac)	7.61
Flow Path Length (ft)	1189.0
Flow Path Slope (vft/hft)	0.193
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.046514217
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	2.9401
Undeveloped Runoff Coefficient (Cu)	0.7269
Developed Runoff Coefficient (Cd)	0.735
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	16.4441
Burned Peak Flow Rate (cfs)	16.4441
24-Hr Clear Runoff Volume (ac-ft)	0.9361
24-Hr Clear Runoff Volume (cu-ft)	40776.078



Peak Flow Hydrologic Analysis

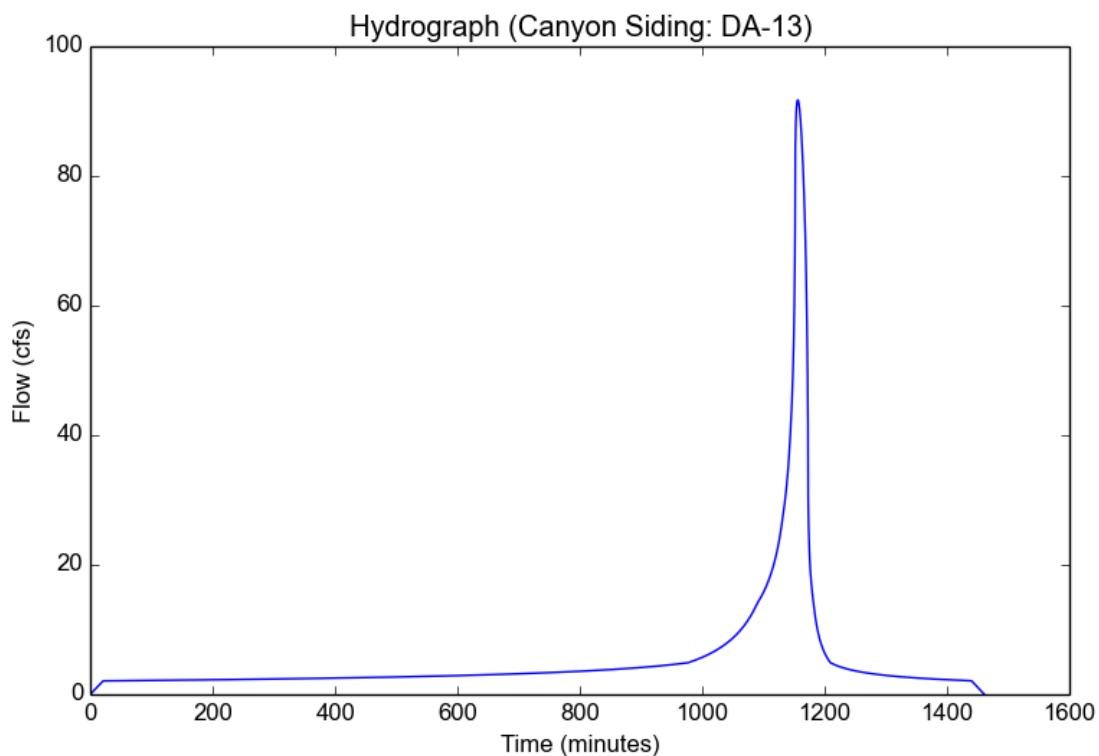
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-13
Area (ac)	71.28
Flow Path Length (ft)	4280.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.142666804
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	1.868
Undeveloped Runoff Coefficient (Cu)	0.6538
Developed Runoff Coefficient (Cd)	0.689
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	91.7329
Burned Peak Flow Rate (cfs)	91.7329
24-Hr Clear Runoff Volume (ac-ft)	11.1245
24-Hr Clear Runoff Volume (cu-ft)	484584.1571



Peak Flow Hydrologic Analysis

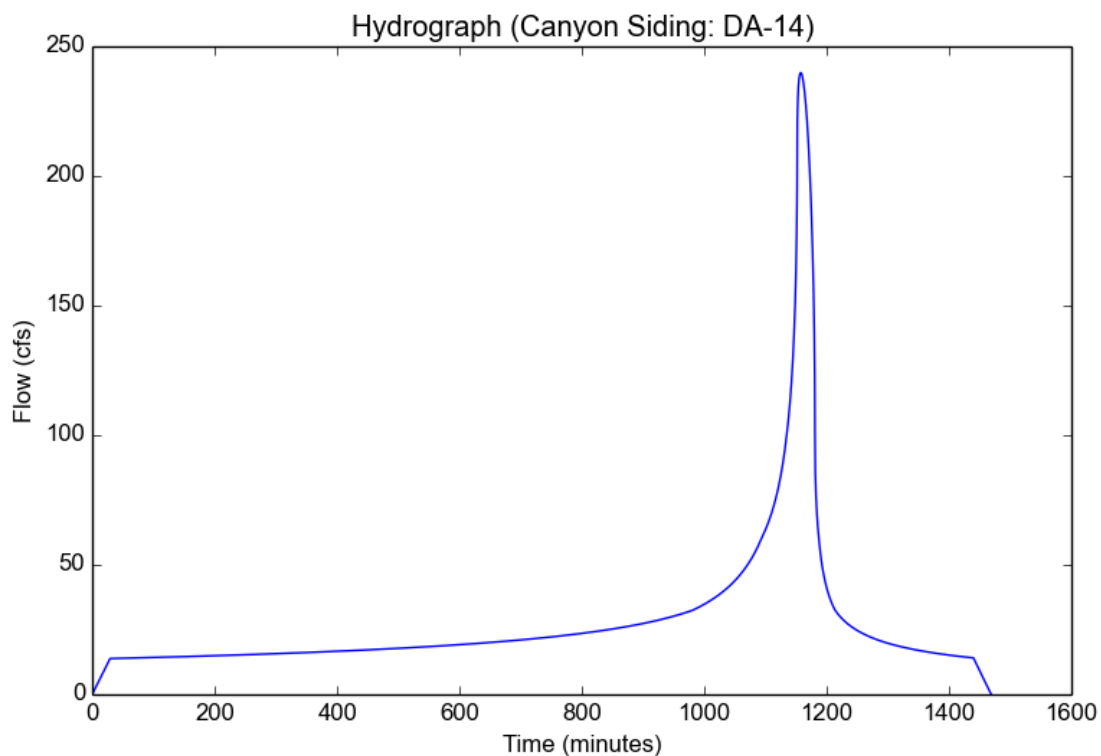
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-14
Area (ac)	194.19
Flow Path Length (ft)	6555.0
Flow Path Slope (vft/hft)	0.047
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.526484739
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	1.605
Undeveloped Runoff Coefficient (Cu)	0.6245
Developed Runoff Coefficient (Cd)	0.7696
Time of Concentration (min)	29.0
Clear Peak Flow Rate (cfs)	239.8569
Burned Peak Flow Rate (cfs)	239.8569
24-Hr Clear Runoff Volume (ac-ft)	56.4444
24-Hr Clear Runoff Volume (cu-ft)	2458718.4986



Peak Flow Hydrologic Analysis

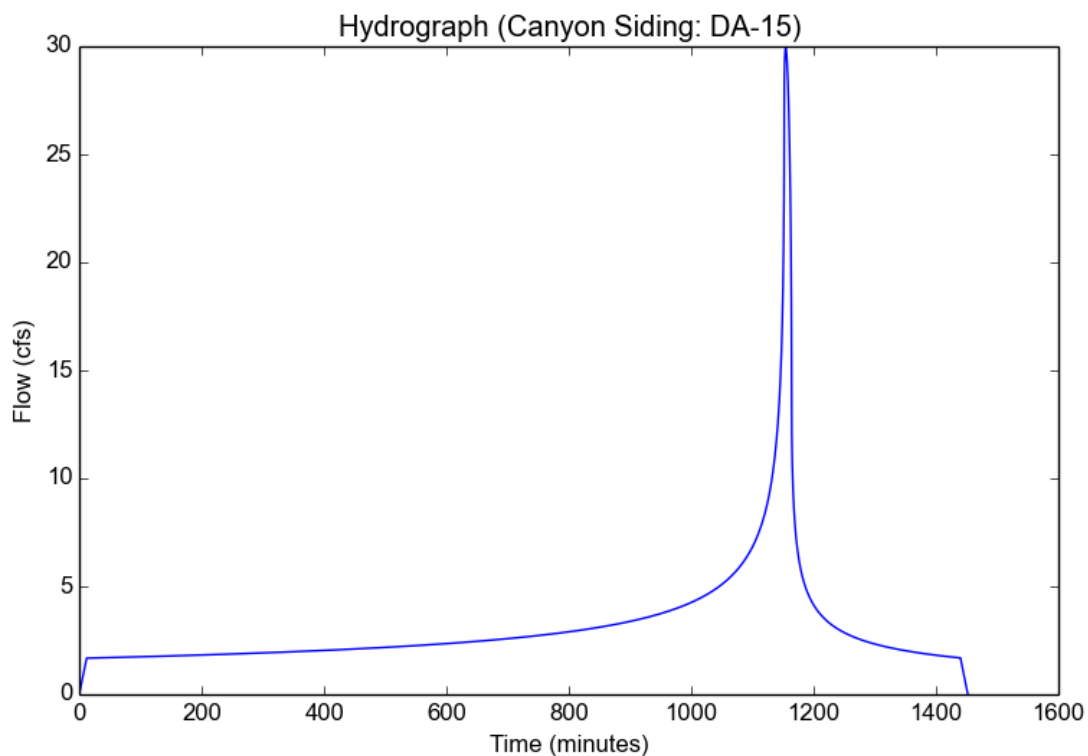
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-15
Area (ac)	13.69
Flow Path Length (ft)	2174.0
Flow Path Slope (vft/hft)	0.069
50-yr Rainfall Depth (in)	7.0
Percent Impervious	1.0
Soil Type	97
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.146
Peak Intensity (in/hr)	2.4299
Undeveloped Runoff Coefficient (Cu)	0.7008
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	29.9394
Burned Peak Flow Rate (cfs)	29.9394
24-Hr Clear Runoff Volume (ac-ft)	6.2583
24-Hr Clear Runoff Volume (cu-ft)	272610.0125



Peak Flow Hydrologic Analysis

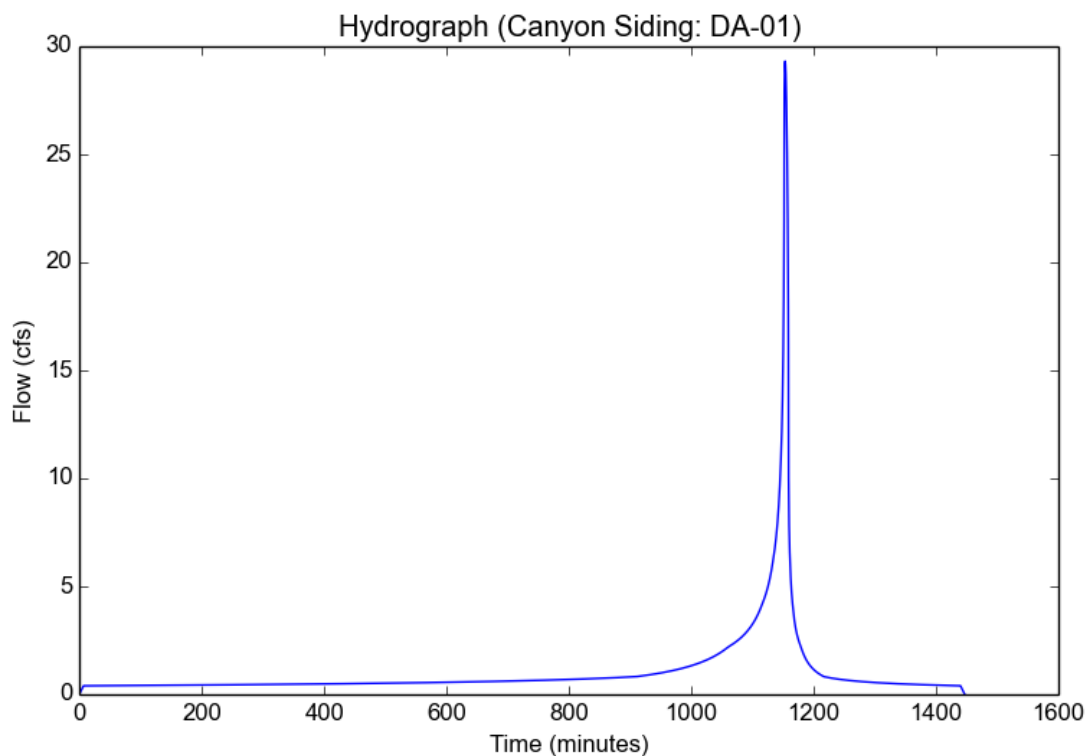
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-01
Area (ac)	10.52
Flow Path Length (ft)	976.0
Flow Path Slope (vft/hft)	0.094
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.180613567
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	3.5655
Undeveloped Runoff Coefficient (Cu)	0.7554
Developed Runoff Coefficient (Cd)	0.7815
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	29.3139
Burned Peak Flow Rate (cfs)	29.3139
24-Hr Clear Runoff Volume (ac-ft)	2.1257
24-Hr Clear Runoff Volume (cu-ft)	92597.5813



Peak Flow Hydrologic Analysis

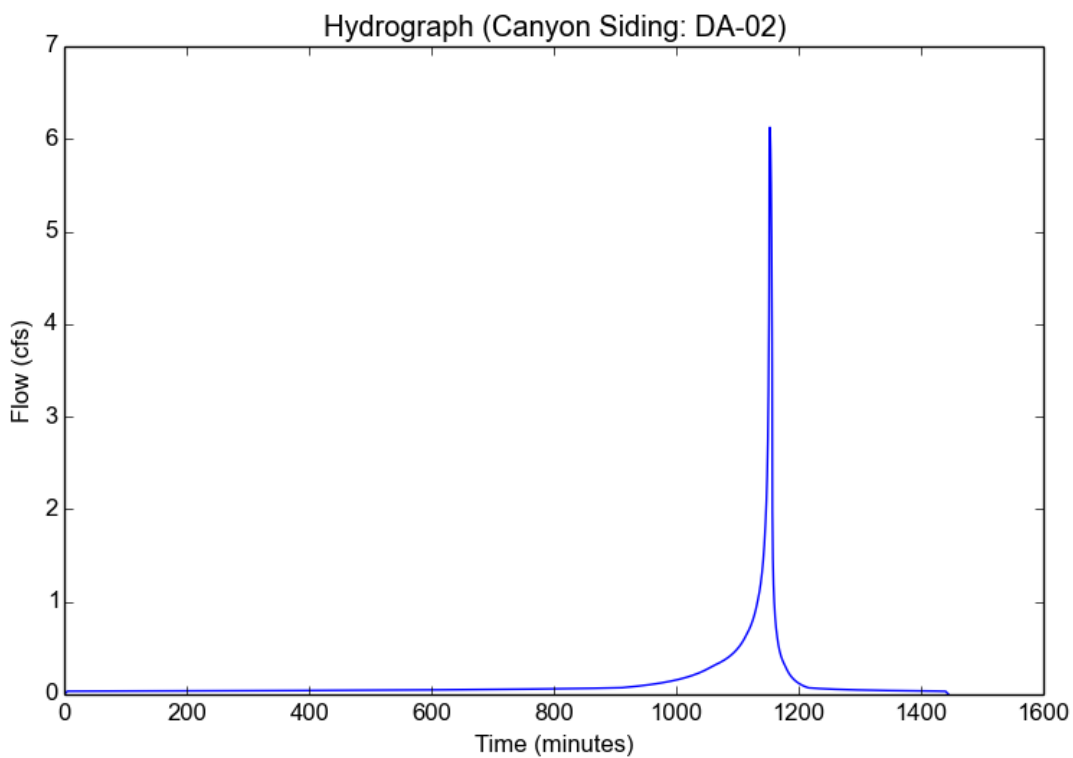
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-02
Area (ac)	1.89
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.15
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.022686757
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	4.1764
Undeveloped Runoff Coefficient (Cu)	0.7731
Developed Runoff Coefficient (Cd)	0.776
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.125
Burned Peak Flow Rate (cfs)	6.125
24-Hr Clear Runoff Volume (ac-ft)	0.266
24-Hr Clear Runoff Volume (cu-ft)	11588.9589



Peak Flow Hydrologic Analysis

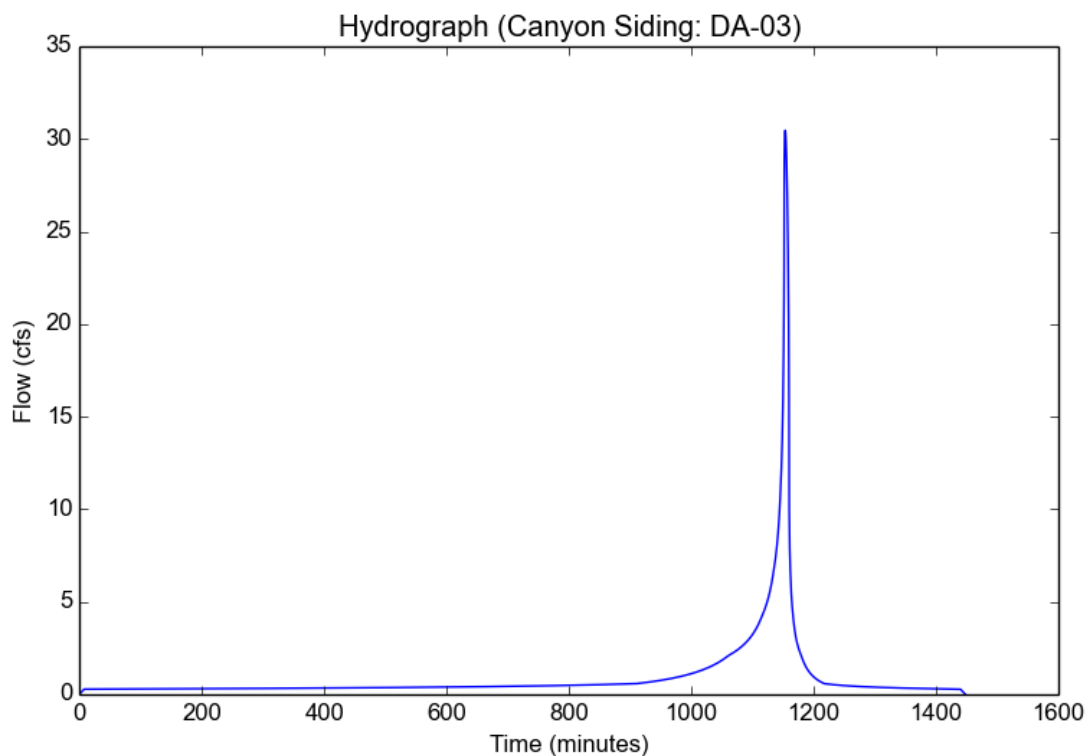
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-03
Area (ac)	12.03
Flow Path Length (ft)	1176.0
Flow Path Slope (vft/hft)	0.109
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.064263505
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	3.3486
Undeveloped Runoff Coefficient (Cu)	0.7463
Developed Runoff Coefficient (Cd)	0.7562
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	30.4621
Burned Peak Flow Rate (cfs)	30.4621
24-Hr Clear Runoff Volume (ac-ft)	1.8857
24-Hr Clear Runoff Volume (cu-ft)	82140.6318



Peak Flow Hydrologic Analysis

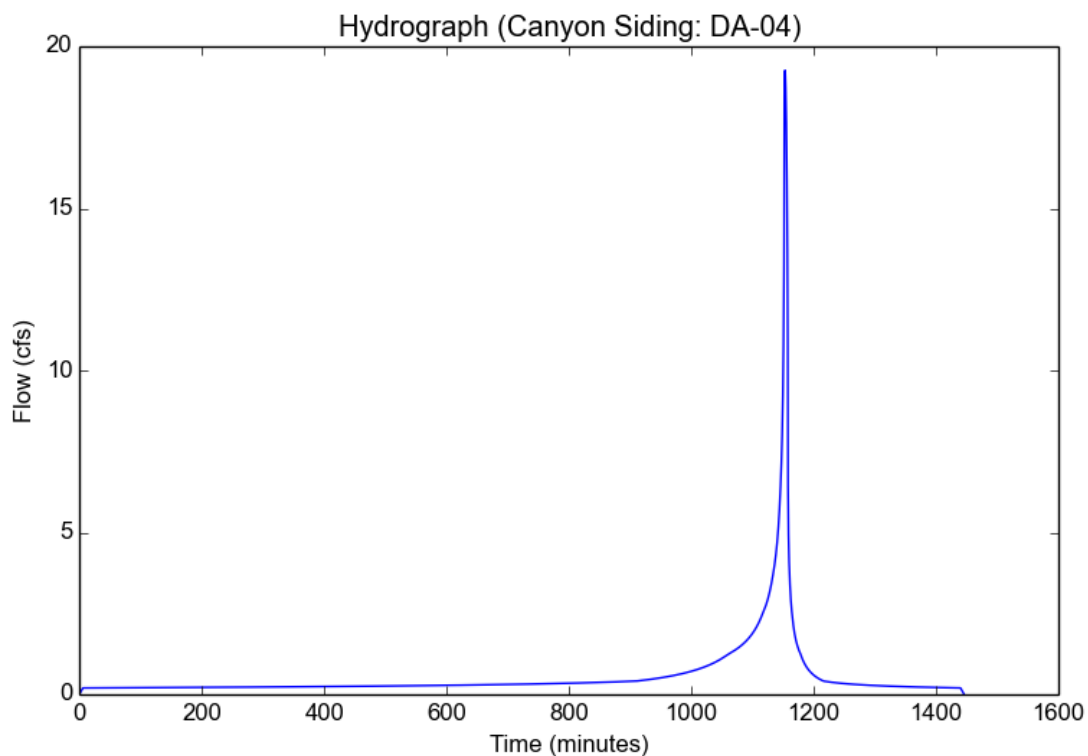
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-04
Area (ac)	6.44
Flow Path Length (ft)	927.0
Flow Path Slope (vft/hft)	0.223
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.123940231
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	3.8334
Undeveloped Runoff Coefficient (Cu)	0.7632
Developed Runoff Coefficient (Cd)	0.7801
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	19.2589
Burned Peak Flow Rate (cfs)	19.2589
24-Hr Clear Runoff Volume (ac-ft)	1.1597
24-Hr Clear Runoff Volume (cu-ft)	50516.3298



Peak Flow Hydrologic Analysis

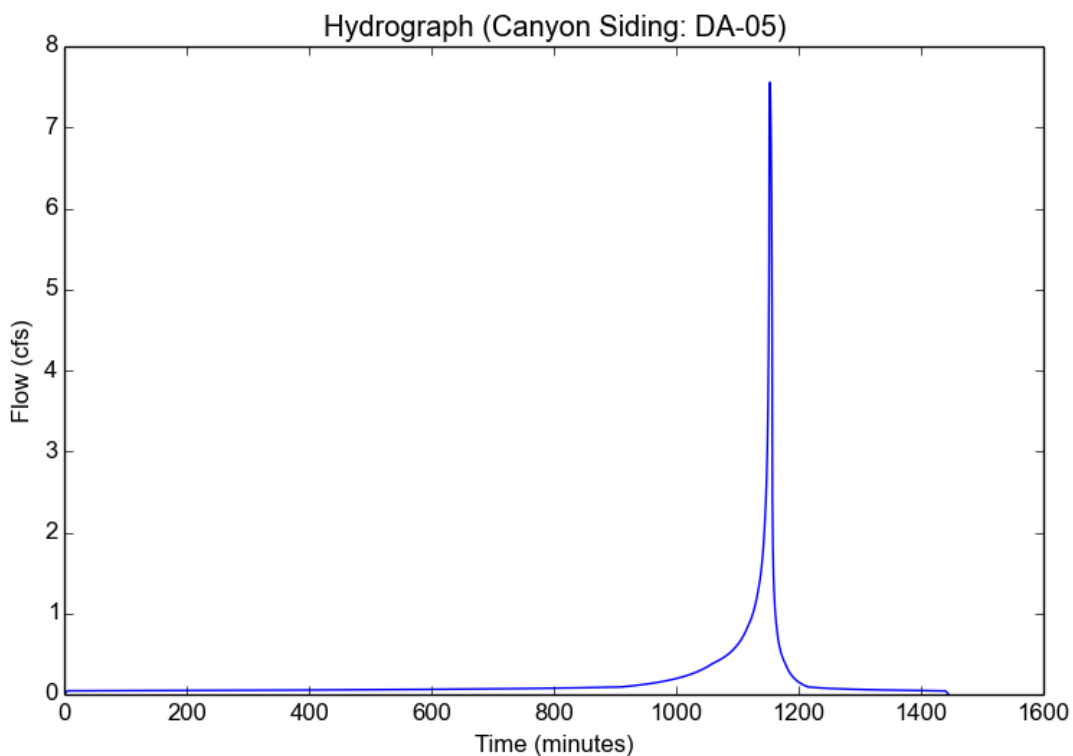
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-05
Area (ac)	2.33
Flow Path Length (ft)	622.0
Flow Path Slope (vft/hft)	0.248
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.027818059
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	4.1764
Undeveloped Runoff Coefficient (Cu)	0.7731
Developed Runoff Coefficient (Cd)	0.7766
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	7.5573
Burned Peak Flow Rate (cfs)	7.5573
24-Hr Clear Runoff Volume (ac-ft)	0.3326
24-Hr Clear Runoff Volume (cu-ft)	14489.3606



Peak Flow Hydrologic Analysis

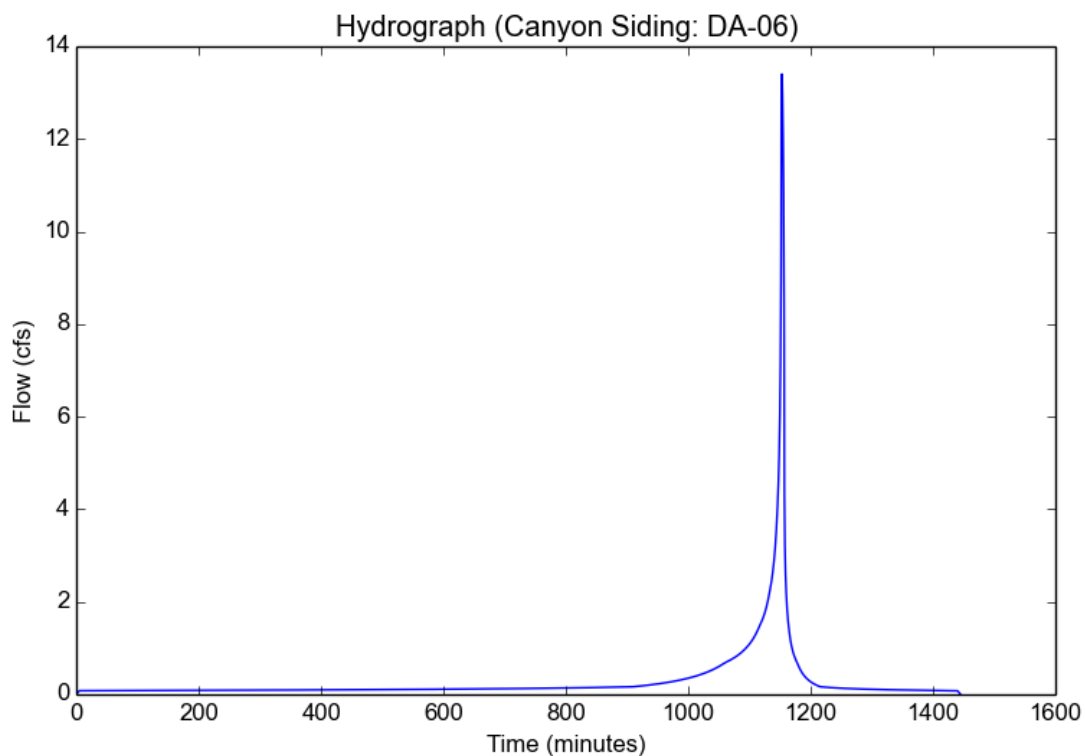
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-06
Area (ac)	4.13
Flow Path Length (ft)	792.0
Flow Path Slope (vft/hft)	0.24
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.030867097
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	4.1764
Undeveloped Runoff Coefficient (Cu)	0.7731
Developed Runoff Coefficient (Cd)	0.777
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	13.4022
Burned Peak Flow Rate (cfs)	13.4022
24-Hr Clear Runoff Volume (ac-ft)	0.5945
24-Hr Clear Runoff Volume (cu-ft)	25896.08



Peak Flow Hydrologic Analysis

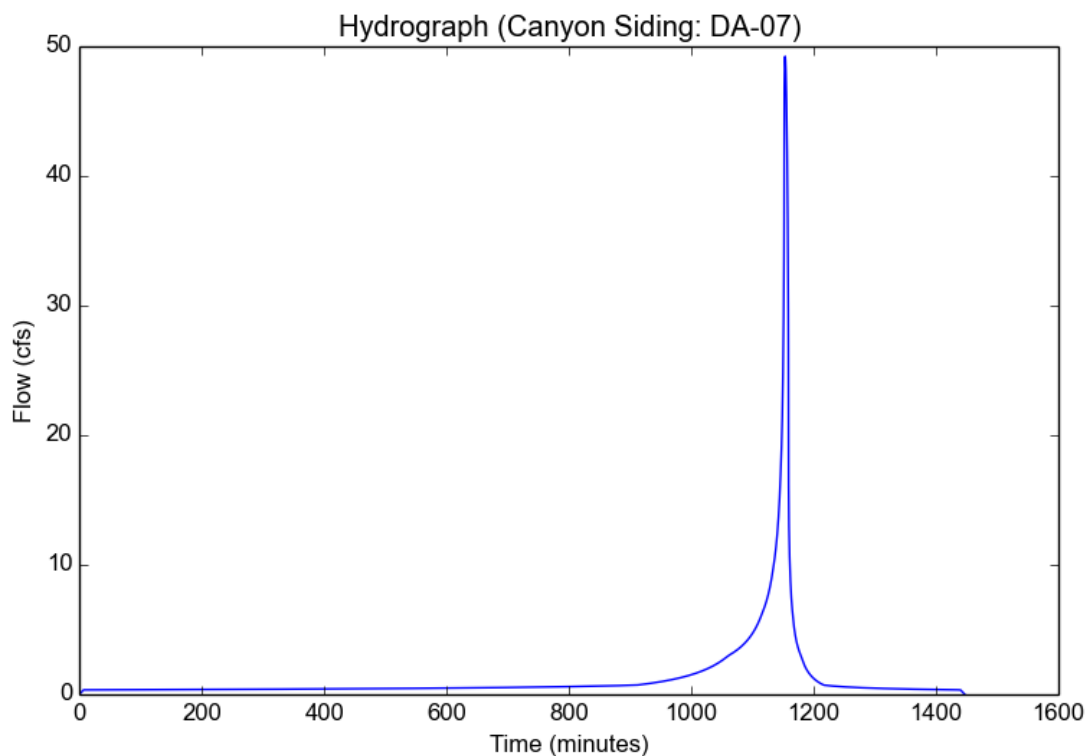
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-07
Area (ac)	18.18
Flow Path Length (ft)	1244.0
Flow Path Slope (vft/hft)	0.208
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.028608006
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	3.5655
Undeveloped Runoff Coefficient (Cu)	0.7554
Developed Runoff Coefficient (Cd)	0.7595
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	49.2336
Burned Peak Flow Rate (cfs)	49.2336
24-Hr Clear Runoff Volume (ac-ft)	2.5991
24-Hr Clear Runoff Volume (cu-ft)	113216.506



Peak Flow Hydrologic Analysis

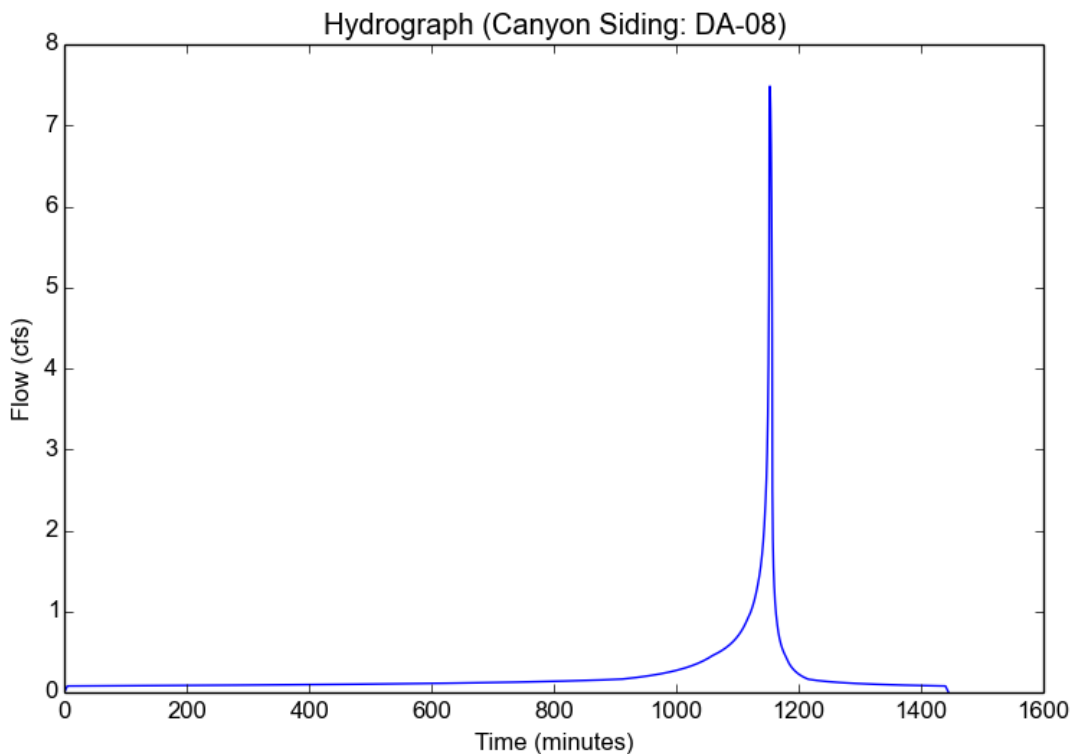
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-08
Area (ac)	2.26
Flow Path Length (ft)	472.0
Flow Path Slope (vft/hft)	0.438
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.156010454
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	4.1764
Undeveloped Runoff Coefficient (Cu)	0.7731
Developed Runoff Coefficient (Cd)	0.7929
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	7.4838
Burned Peak Flow Rate (cfs)	7.4838
24-Hr Clear Runoff Volume (ac-ft)	0.4353
24-Hr Clear Runoff Volume (cu-ft)	18959.6321



Peak Flow Hydrologic Analysis

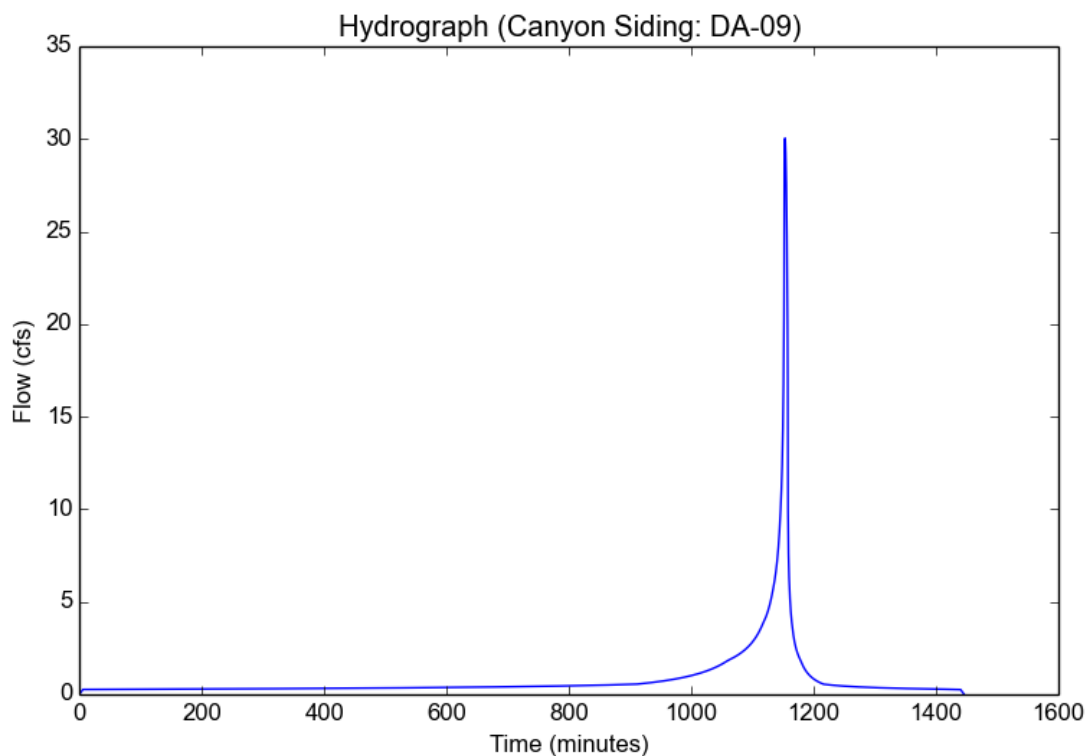
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-09
Area (ac)	10.11
Flow Path Length (ft)	1025.0
Flow Path Slope (vft/hft)	0.202
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.087673207
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	3.8334
Undeveloped Runoff Coefficient (Cu)	0.7632
Developed Runoff Coefficient (Cd)	0.7752
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	30.0417
Burned Peak Flow Rate (cfs)	30.0417
24-Hr Clear Runoff Volume (ac-ft)	1.678
24-Hr Clear Runoff Volume (cu-ft)	73095.0709



Peak Flow Hydrologic Analysis

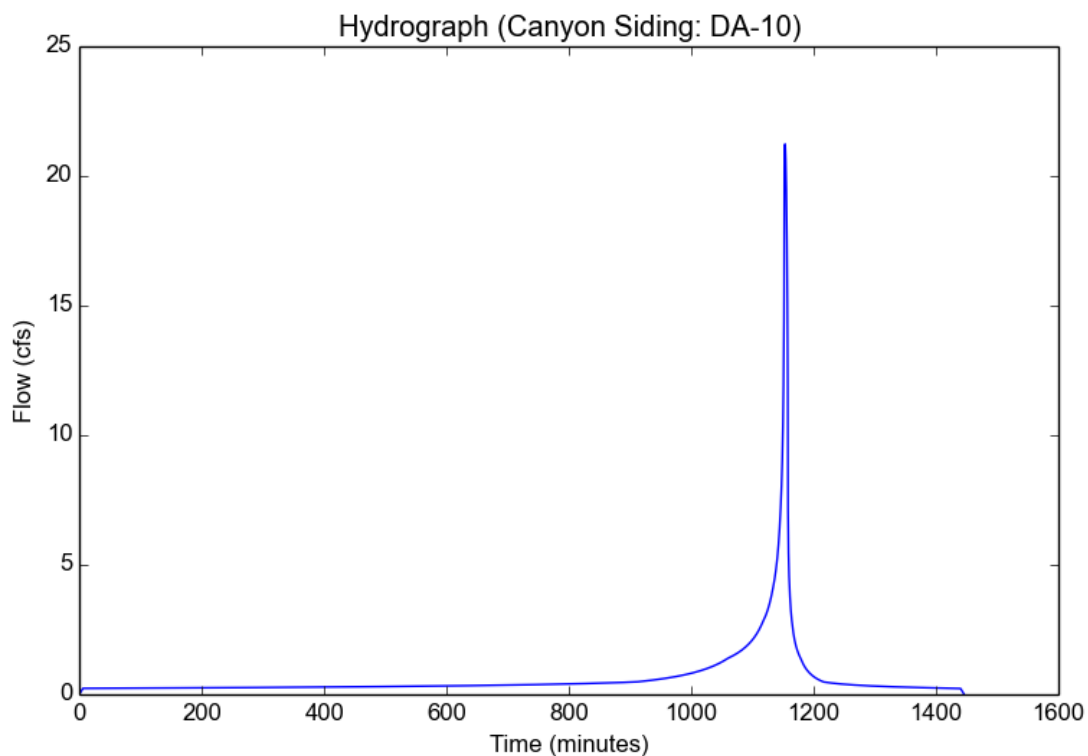
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-10
Area (ac)	7.08
Flow Path Length (ft)	887.0
Flow Path Slope (vft/hft)	0.226
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.140092863
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	3.8334
Undeveloped Runoff Coefficient (Cu)	0.7632
Developed Runoff Coefficient (Cd)	0.7823
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	21.2328
Burned Peak Flow Rate (cfs)	21.2328
24-Hr Clear Runoff Volume (ac-ft)	1.3194
24-Hr Clear Runoff Volume (cu-ft)	57473.2558



Peak Flow Hydrologic Analysis

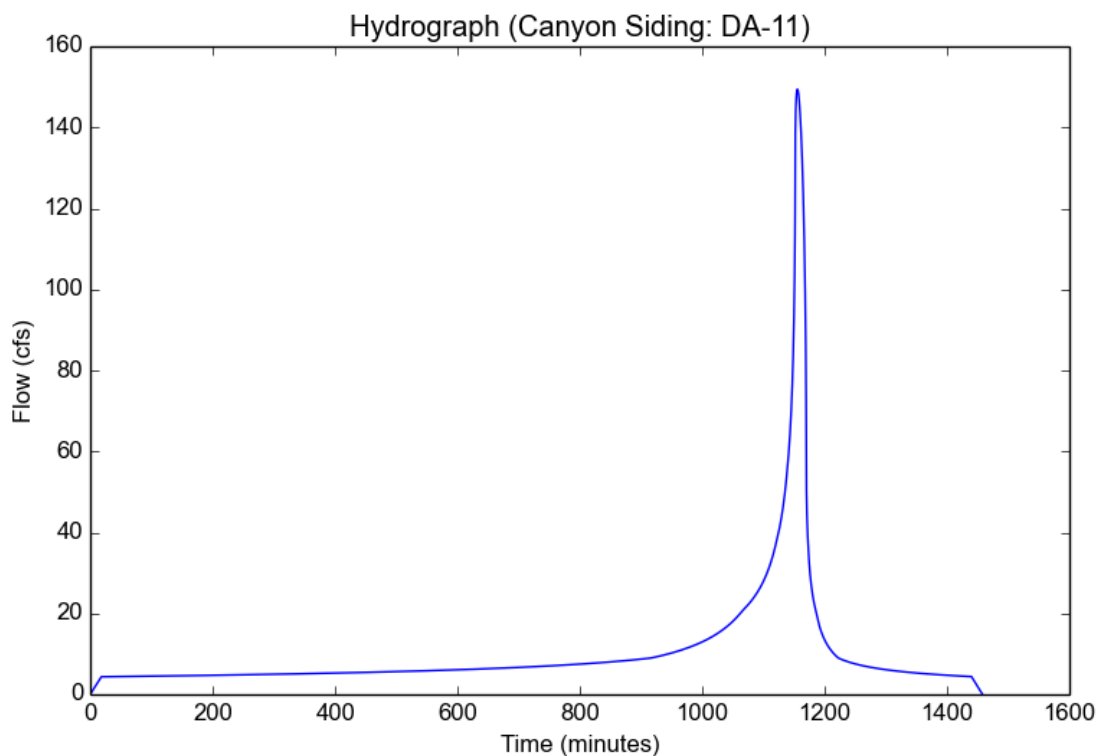
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-11
Area (ac)	87.33
Flow Path Length (ft)	4047.0
Flow Path Slope (vft/hft)	0.101
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.276140604
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	2.2874
Undeveloped Runoff Coefficient (Cu)	0.6901
Developed Runoff Coefficient (Cd)	0.7481
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	149.4284
Burned Peak Flow Rate (cfs)	149.4284
24-Hr Clear Runoff Volume (ac-ft)	20.8505
24-Hr Clear Runoff Volume (cu-ft)	908246.6439



Peak Flow Hydrologic Analysis

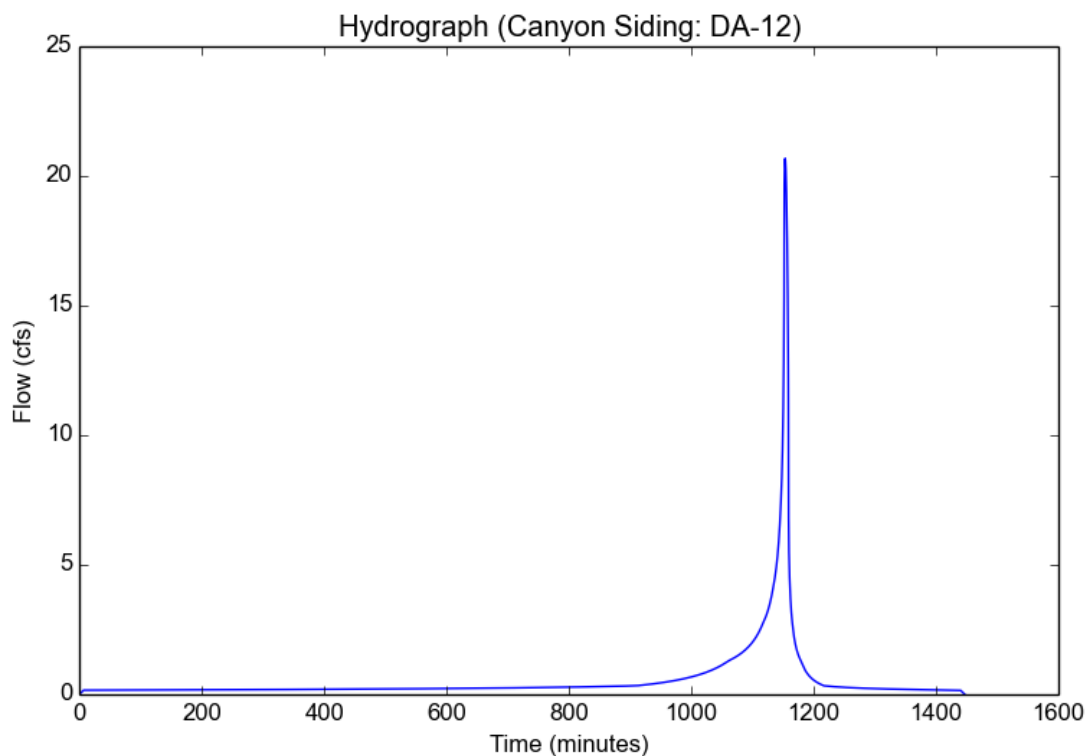
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-12
Area (ac)	7.61
Flow Path Length (ft)	1189.0
Flow Path Slope (vft/hft)	0.193
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.046514217
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	3.5655
Undeveloped Runoff Coefficient (Cu)	0.7554
Developed Runoff Coefficient (Cd)	0.7621
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	20.679
Burned Peak Flow Rate (cfs)	20.679
24-Hr Clear Runoff Volume (ac-ft)	1.1409
24-Hr Clear Runoff Volume (cu-ft)	49699.4519



Peak Flow Hydrologic Analysis

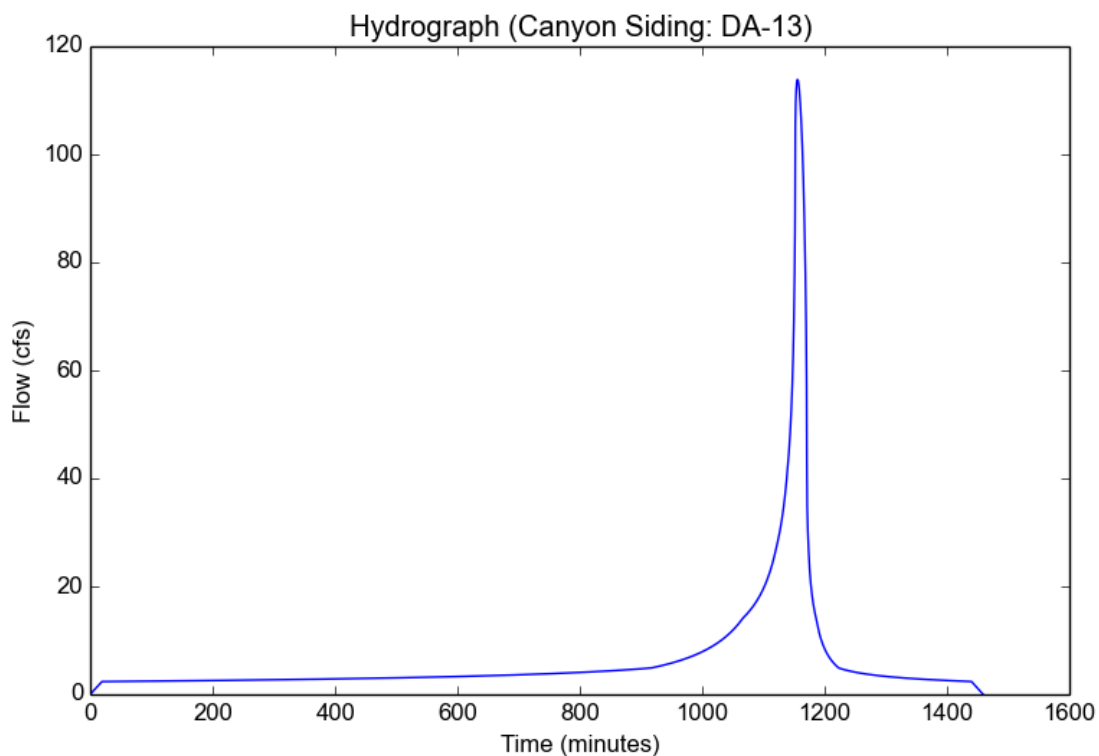
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-13
Area (ac)	71.28
Flow Path Length (ft)	4280.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.142666804
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	2.23
Undeveloped Runoff Coefficient (Cu)	0.6858
Developed Runoff Coefficient (Cd)	0.7163
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	113.8656
Burned Peak Flow Rate (cfs)	113.8656
24-Hr Clear Runoff Volume (ac-ft)	13.3099
24-Hr Clear Runoff Volume (cu-ft)	579778.244



Peak Flow Hydrologic Analysis

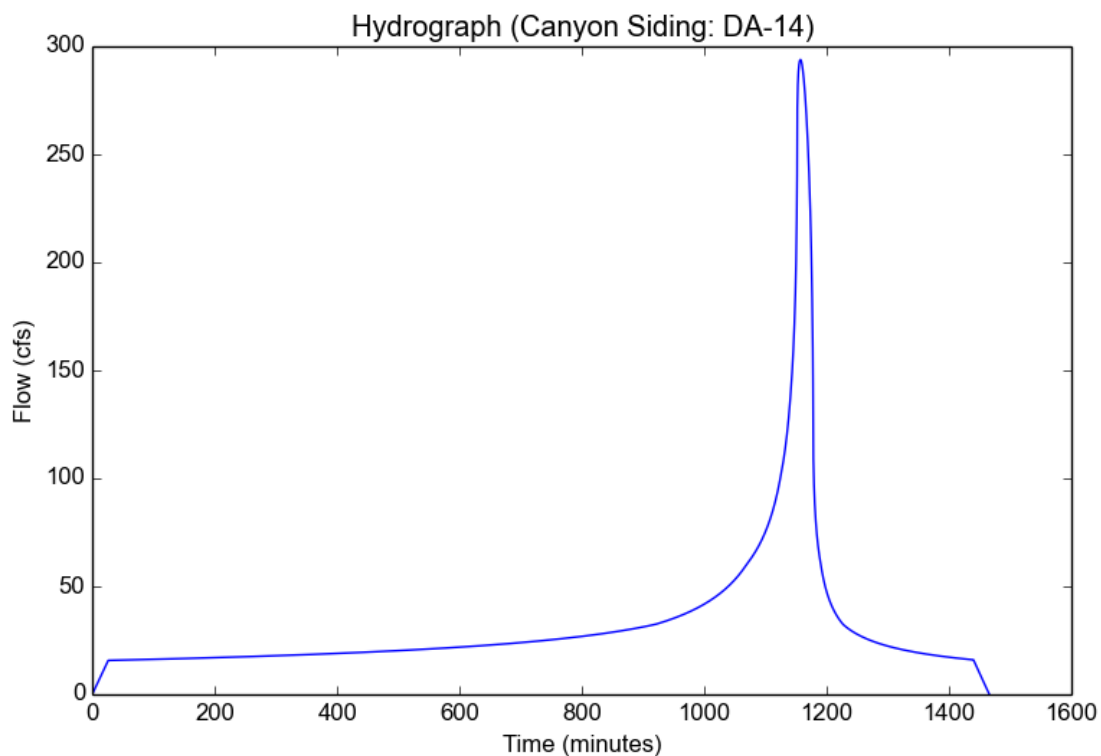
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-14
Area (ac)	194.19
Flow Path Length (ft)	6555.0
Flow Path Slope (vft/hft)	0.047
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.526484739
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	1.9243
Undeveloped Runoff Coefficient (Cu)	0.6601
Developed Runoff Coefficient (Cd)	0.7864
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	293.8704
Burned Peak Flow Rate (cfs)	293.8704
24-Hr Clear Runoff Volume (ac-ft)	65.2532
24-Hr Clear Runoff Volume (cu-ft)	2842428.4633



Peak Flow Hydrologic Analysis

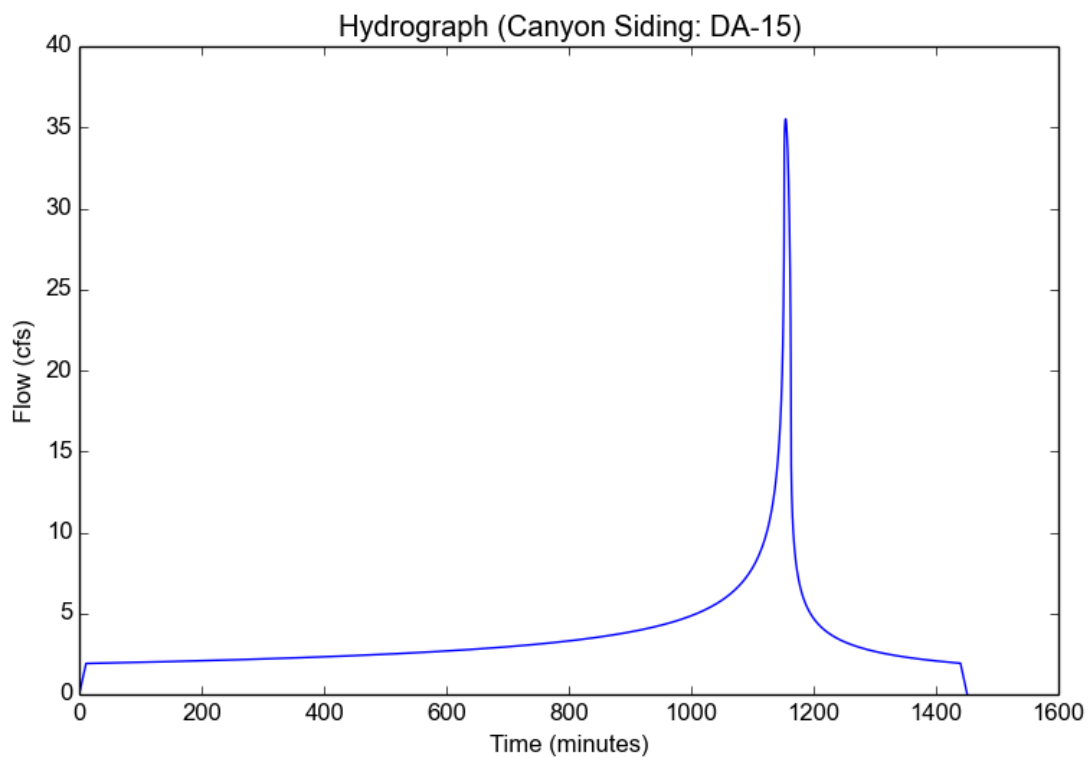
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-15
Area (ac)	13.69
Flow Path Length (ft)	2174.0
Flow Path Slope (vft/hft)	0.069
50-yr Rainfall Depth (in)	7.0
Percent Impervious	1.0
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	2.8831
Undeveloped Runoff Coefficient (Cu)	0.7242
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	35.5229
Burned Peak Flow Rate (cfs)	35.5229
24-Hr Clear Runoff Volume (ac-ft)	7.1279
24-Hr Clear Runoff Volume (cu-ft)	310489.6733



Peak Flow Hydrologic Analysis

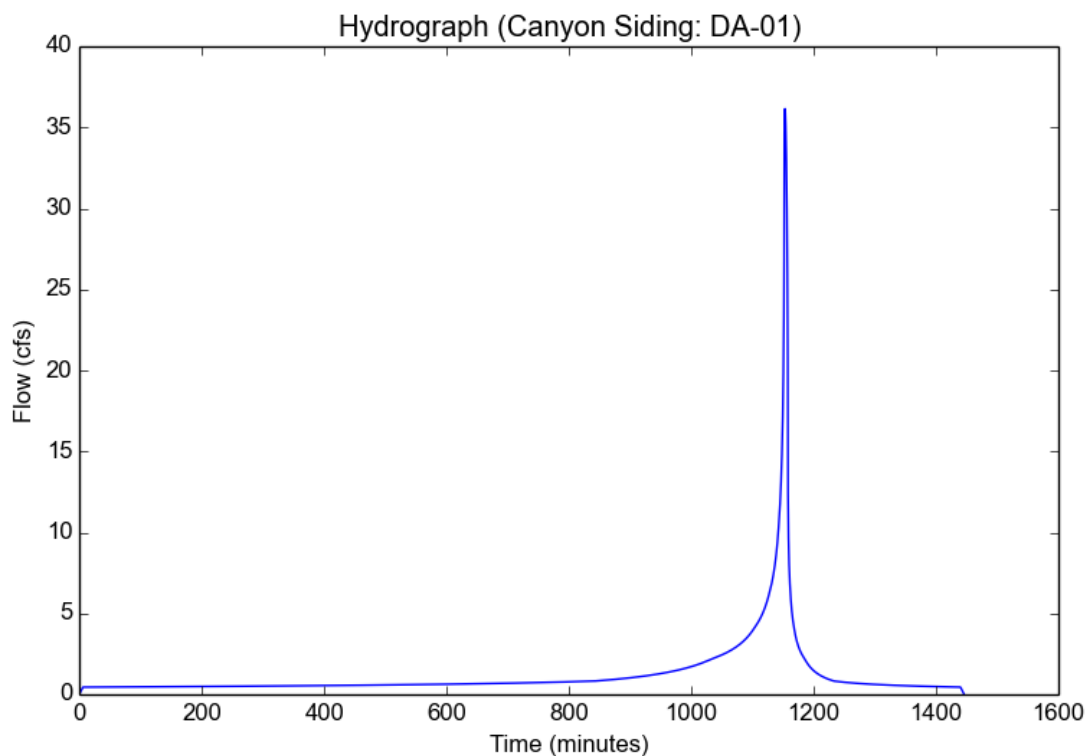
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-01
Area (ac)	10.52
Flow Path Length (ft)	976.0
Flow Path Slope (vft/hft)	0.094
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.180613567
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.3011
Undeveloped Runoff Coefficient (Cu)	0.7767
Developed Runoff Coefficient (Cd)	0.799
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	36.1514
Burned Peak Flow Rate (cfs)	36.1514
24-Hr Clear Runoff Volume (ac-ft)	2.4857
24-Hr Clear Runoff Volume (cu-ft)	108275.2485



Peak Flow Hydrologic Analysis

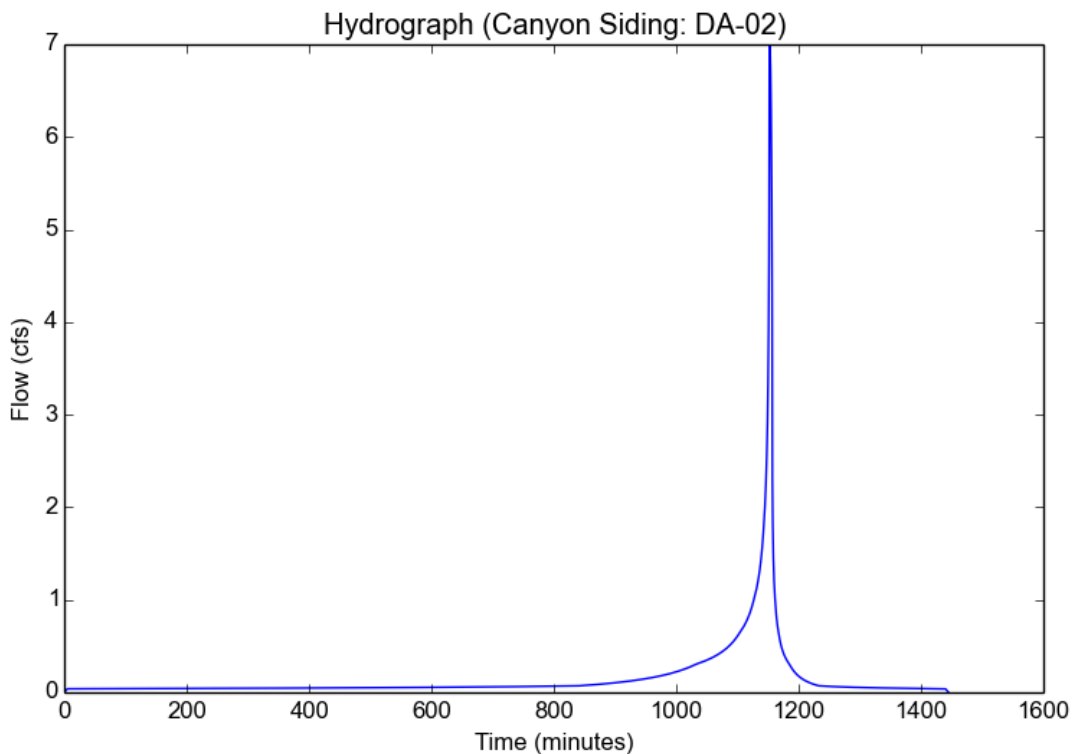
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-02
Area (ac)	1.89
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.15
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.022686757
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.6859
Undeveloped Runoff Coefficient (Cu)	0.7854
Developed Runoff Coefficient (Cd)	0.788
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.9787
Burned Peak Flow Rate (cfs)	6.9787
24-Hr Clear Runoff Volume (ac-ft)	0.32
24-Hr Clear Runoff Volume (cu-ft)	13937.1176



Peak Flow Hydrologic Analysis

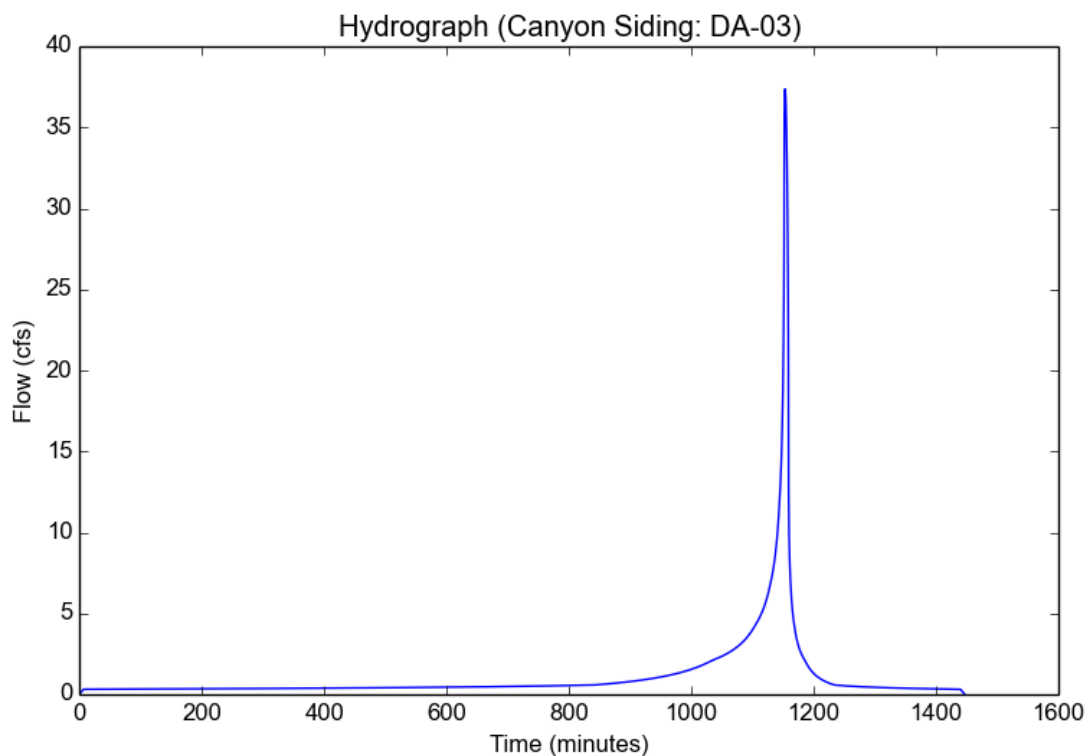
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-03
Area (ac)	12.03
Flow Path Length (ft)	1176.0
Flow Path Slope (vft/hft)	0.109
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.064263505
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.0005
Undeveloped Runoff Coefficient (Cu)	0.768
Developed Runoff Coefficient (Cd)	0.7765
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	37.3688
Burned Peak Flow Rate (cfs)	37.3688
24-Hr Clear Runoff Volume (ac-ft)	2.2475
24-Hr Clear Runoff Volume (cu-ft)	97899.2043



Peak Flow Hydrologic Analysis

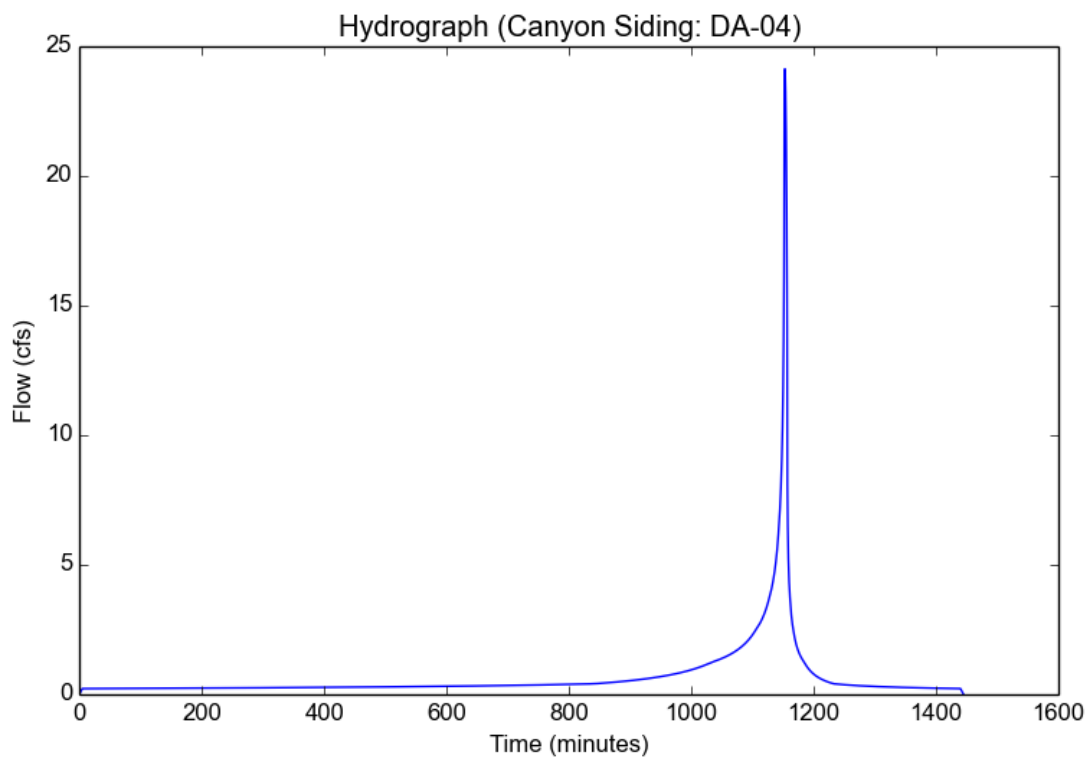
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-04
Area (ac)	6.44
Flow Path Length (ft)	927.0
Flow Path Slope (vft/hft)	0.223
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.123940231
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.6859
Undeveloped Runoff Coefficient (Cu)	0.7854
Developed Runoff Coefficient (Cd)	0.7996
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	24.1295
Burned Peak Flow Rate (cfs)	24.1295
24-Hr Clear Runoff Volume (ac-ft)	1.367
24-Hr Clear Runoff Volume (cu-ft)	59547.797



Peak Flow Hydrologic Analysis

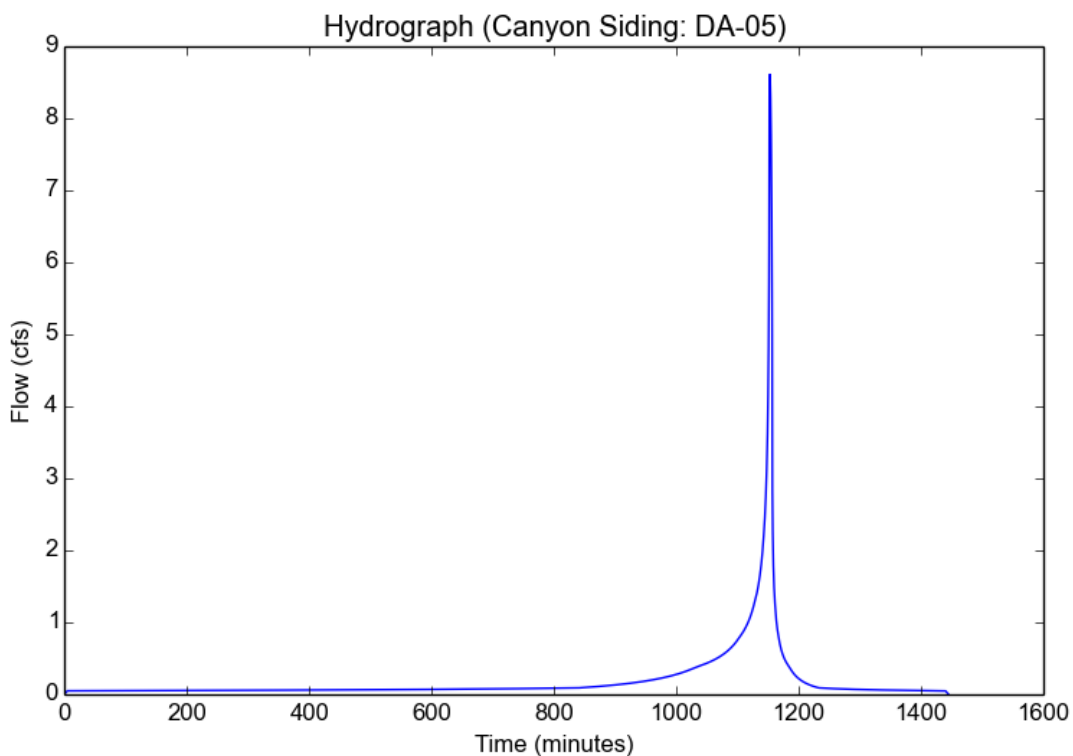
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-05
Area (ac)	2.33
Flow Path Length (ft)	622.0
Flow Path Slope (vft/hft)	0.248
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.027818059
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.6859
Undeveloped Runoff Coefficient (Cu)	0.7854
Developed Runoff Coefficient (Cd)	0.7886
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	8.6098
Burned Peak Flow Rate (cfs)	8.6098
24-Hr Clear Runoff Volume (ac-ft)	0.3995
24-Hr Clear Runoff Volume (cu-ft)	17402.831



Peak Flow Hydrologic Analysis

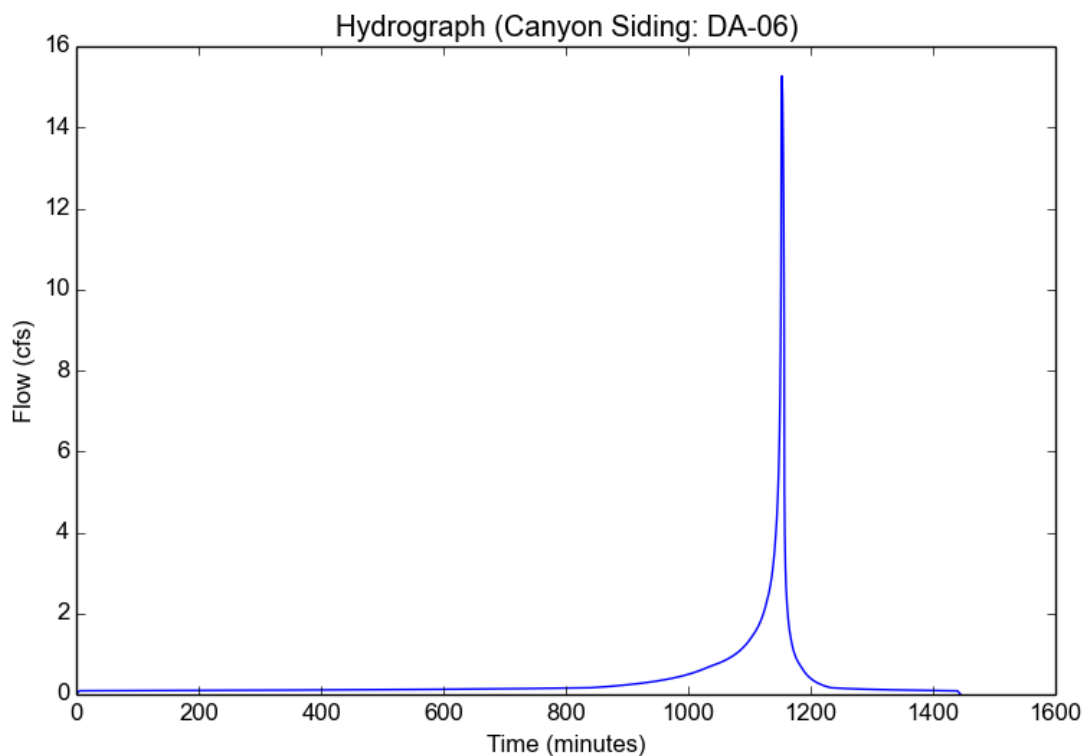
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-06
Area (ac)	4.13
Flow Path Length (ft)	792.0
Flow Path Slope (vft/hft)	0.24
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.030867097
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.6859
Undeveloped Runoff Coefficient (Cu)	0.7854
Developed Runoff Coefficient (Cd)	0.7889
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	15.2679
Burned Peak Flow Rate (cfs)	15.2679
24-Hr Clear Runoff Volume (ac-ft)	0.7135
24-Hr Clear Runoff Volume (cu-ft)	31079.9437



Peak Flow Hydrologic Analysis

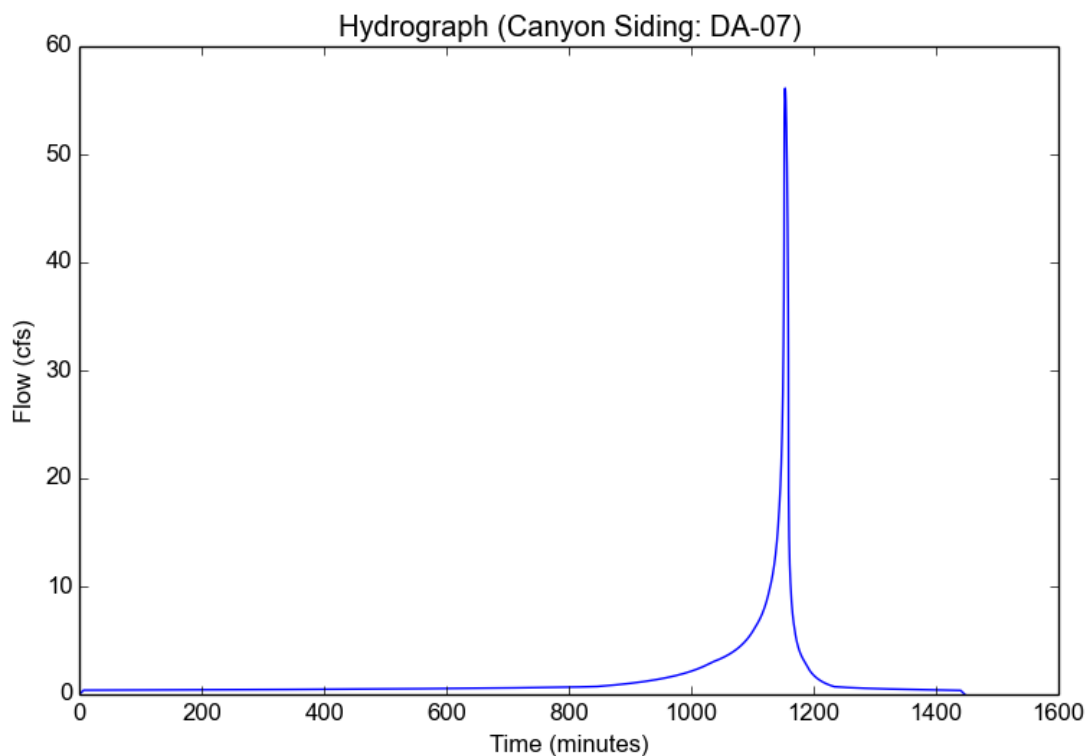
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-07
Area (ac)	18.18
Flow Path Length (ft)	1244.0
Flow Path Slope (vft/hft)	0.208
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.028608006
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.0005
Undeveloped Runoff Coefficient (Cu)	0.768
Developed Runoff Coefficient (Cd)	0.7718
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	56.1302
Burned Peak Flow Rate (cfs)	56.1302
24-Hr Clear Runoff Volume (ac-ft)	3.1211
24-Hr Clear Runoff Volume (cu-ft)	135956.8471



Peak Flow Hydrologic Analysis

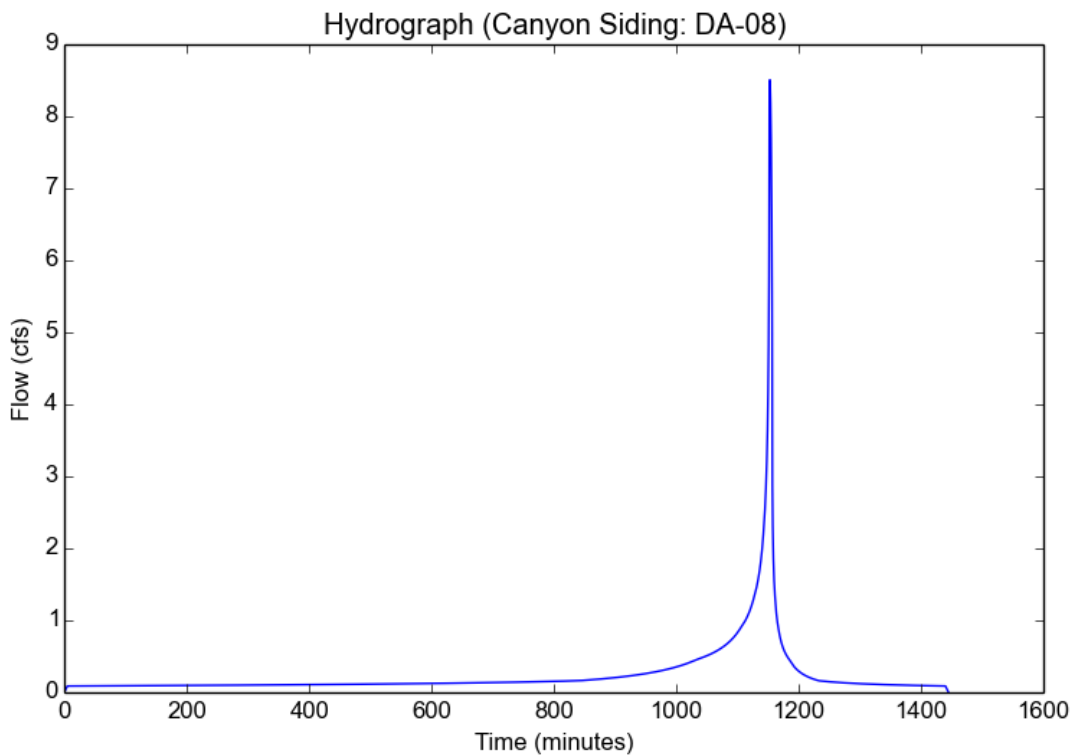
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-08
Area (ac)	2.26
Flow Path Length (ft)	472.0
Flow Path Slope (vft/hft)	0.438
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.156010454
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.6859
Undeveloped Runoff Coefficient (Cu)	0.7854
Developed Runoff Coefficient (Cd)	0.8033
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	8.5067
Burned Peak Flow Rate (cfs)	8.5067
24-Hr Clear Runoff Volume (ac-ft)	0.5105
24-Hr Clear Runoff Volume (cu-ft)	22237.5108



Peak Flow Hydrologic Analysis

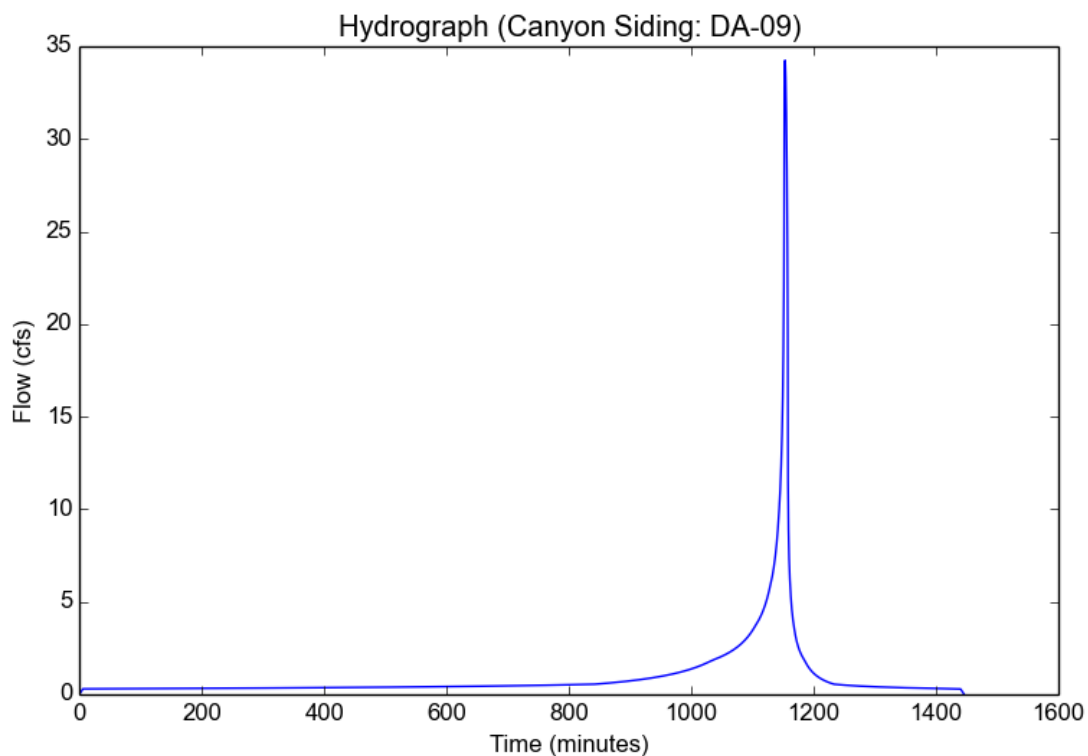
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-09
Area (ac)	10.11
Flow Path Length (ft)	1025.0
Flow Path Slope (vft/hft)	0.202
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.087673207
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.3011
Undeveloped Runoff Coefficient (Cu)	0.7767
Developed Runoff Coefficient (Cd)	0.7875
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	34.2442
Burned Peak Flow Rate (cfs)	34.2442
24-Hr Clear Runoff Volume (ac-ft)	1.9898
24-Hr Clear Runoff Volume (cu-ft)	86676.8841



Peak Flow Hydrologic Analysis

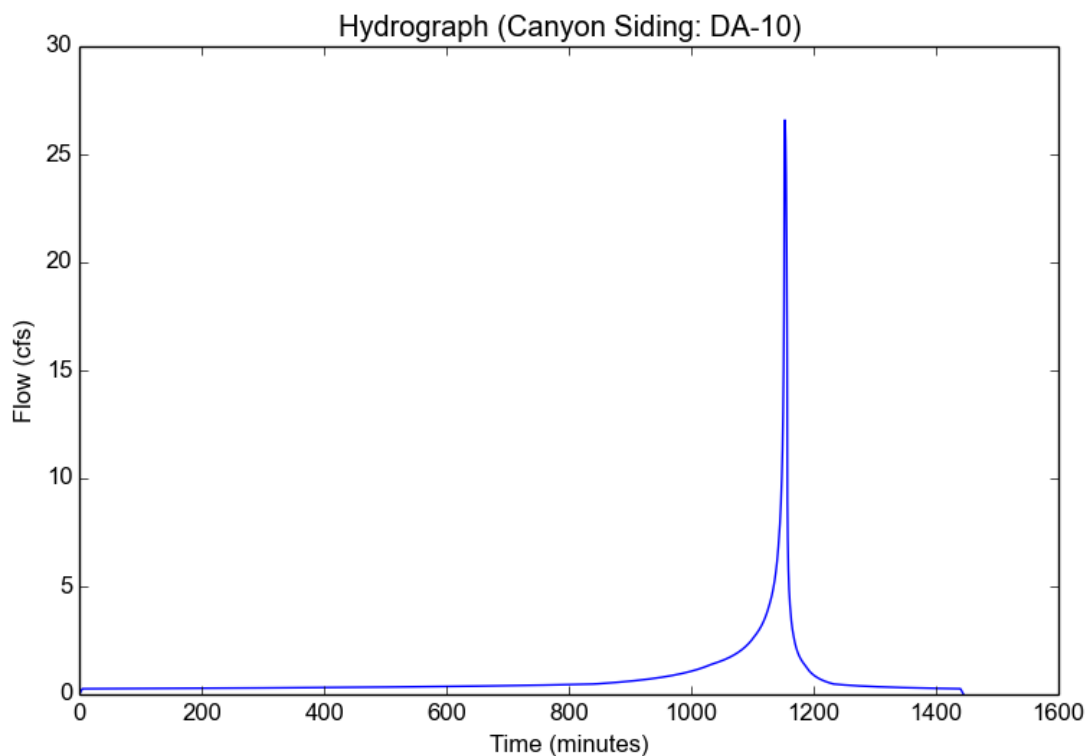
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-10
Area (ac)	7.08
Flow Path Length (ft)	887.0
Flow Path Slope (vft/hft)	0.226
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.140092863
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.6859
Undeveloped Runoff Coefficient (Cu)	0.7854
Developed Runoff Coefficient (Cd)	0.8014
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	26.5889
Burned Peak Flow Rate (cfs)	26.5889
24-Hr Clear Runoff Volume (ac-ft)	1.5514
24-Hr Clear Runoff Volume (cu-ft)	67580.3889



Peak Flow Hydrologic Analysis

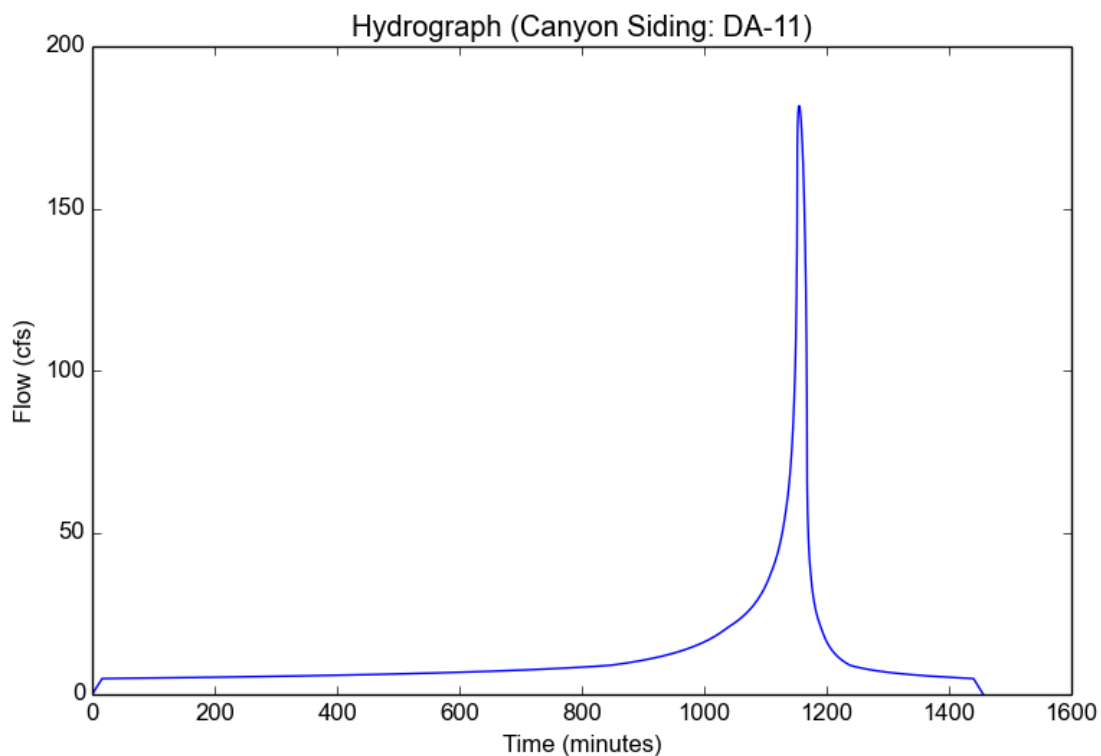
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-11
Area (ac)	87.33
Flow Path Length (ft)	4047.0
Flow Path Slope (vft/hft)	0.101
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.276140604
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	2.7125
Undeveloped Runoff Coefficient (Cu)	0.7161
Developed Runoff Coefficient (Cd)	0.7669
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	181.6638
Burned Peak Flow Rate (cfs)	181.6638
24-Hr Clear Runoff Volume (ac-ft)	24.1404
24-Hr Clear Runoff Volume (cu-ft)	1051556.9198



Peak Flow Hydrologic Analysis

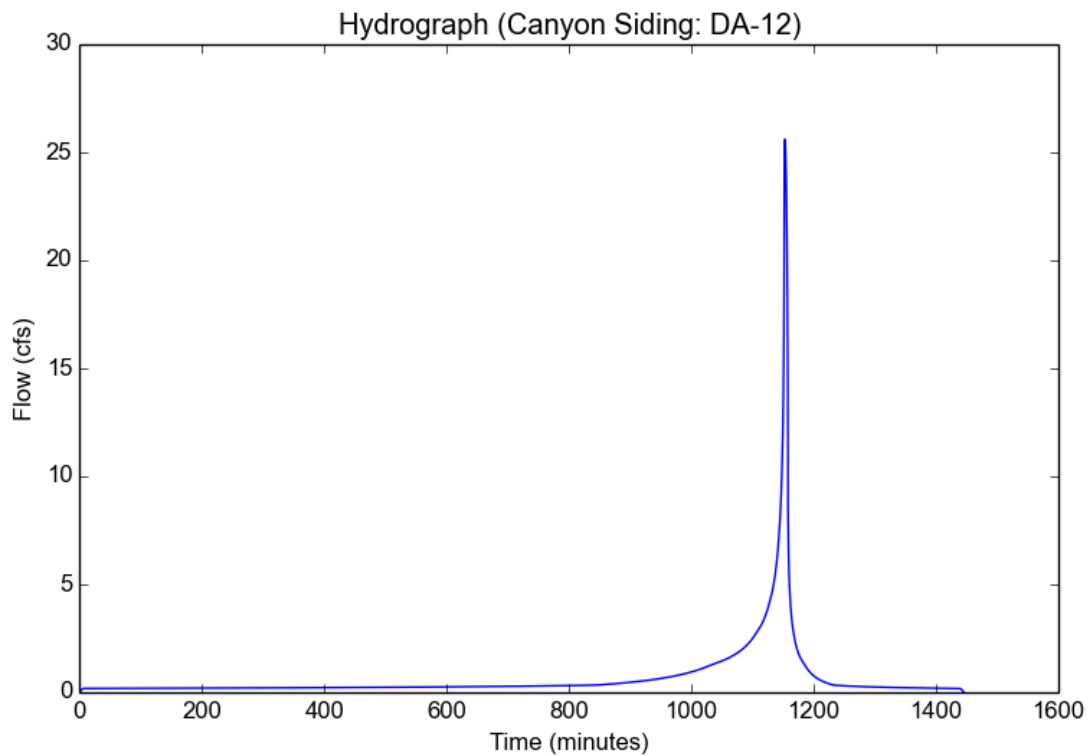
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-12
Area (ac)	7.61
Flow Path Length (ft)	1189.0
Flow Path Slope (vft/hft)	0.193
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.046514217
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	4.3011
Undeveloped Runoff Coefficient (Cu)	0.7767
Developed Runoff Coefficient (Cd)	0.7824
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	25.6102
Burned Peak Flow Rate (cfs)	25.6102
24-Hr Clear Runoff Volume (ac-ft)	1.3648
24-Hr Clear Runoff Volume (cu-ft)	59450.3923



Peak Flow Hydrologic Analysis

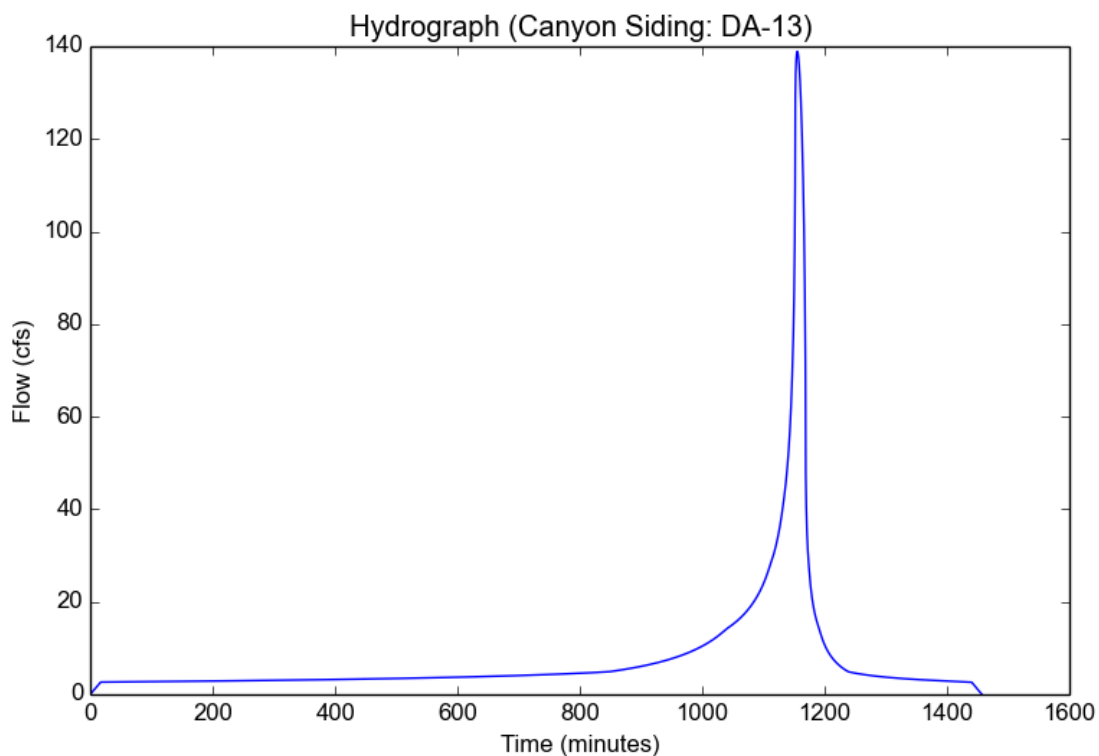
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-13
Area (ac)	71.28
Flow Path Length (ft)	4280.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.142666804
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	2.6363
Undeveloped Runoff Coefficient (Cu)	0.7125
Developed Runoff Coefficient (Cd)	0.7392
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	138.916
Burned Peak Flow Rate (cfs)	138.916
24-Hr Clear Runoff Volume (ac-ft)	15.6565
24-Hr Clear Runoff Volume (cu-ft)	681997.8191



Peak Flow Hydrologic Analysis

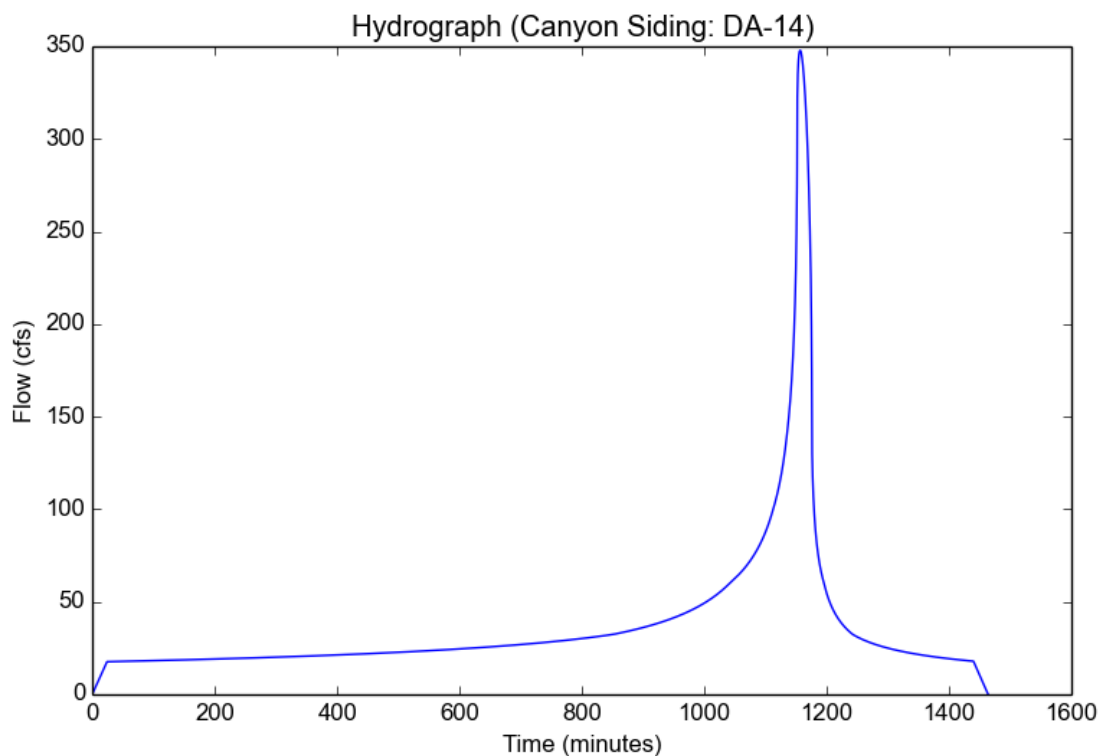
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-14
Area (ac)	194.19
Flow Path Length (ft)	6555.0
Flow Path Slope (vft/hft)	0.047
50-yr Rainfall Depth (in)	7.0
Percent Impervious	0.526484739
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	2.2419
Undeveloped Runoff Coefficient (Cu)	0.6867
Developed Runoff Coefficient (Cd)	0.799
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	347.838
Burned Peak Flow Rate (cfs)	347.838
24-Hr Clear Runoff Volume (ac-ft)	74.3072
24-Hr Clear Runoff Volume (cu-ft)	3236819.7833



Peak Flow Hydrologic Analysis

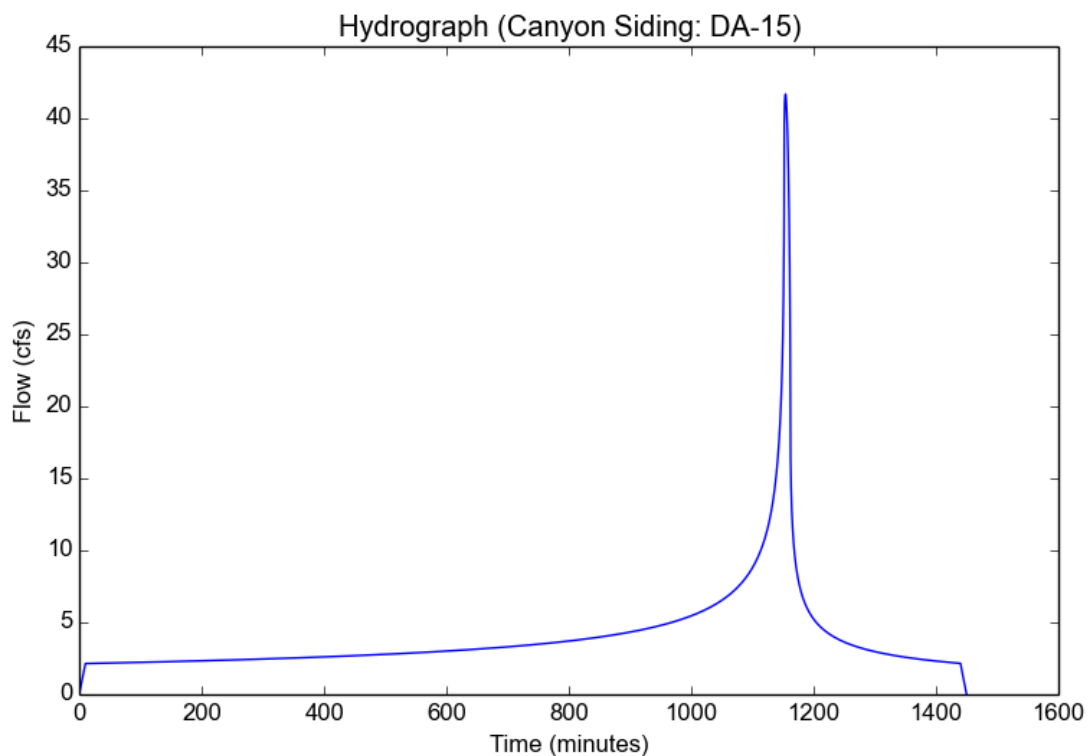
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-15
Area (ac)	13.69
Flow Path Length (ft)	2174.0
Flow Path Slope (vft/hft)	0.069
50-yr Rainfall Depth (in)	7.0
Percent Impervious	1.0
Soil Type	97
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.854
Peak Intensity (in/hr)	3.3831
Undeveloped Runoff Coefficient (Cu)	0.7479
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	41.6827
Burned Peak Flow Rate (cfs)	41.6827
24-Hr Clear Runoff Volume (ac-ft)	7.9975
24-Hr Clear Runoff Volume (cu-ft)	348369.321



Peak Flow Hydrologic Analysis

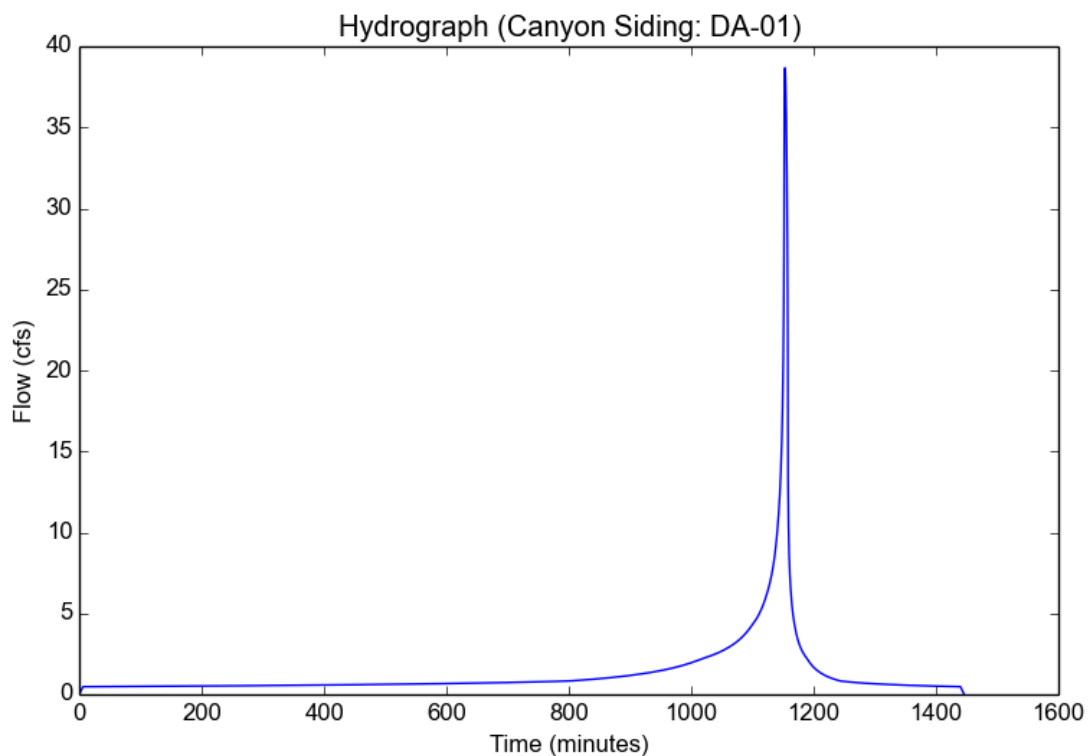
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-01
Area (ac)	10.52
Flow Path Length (ft)	976.0
Flow Path Slope (vft/hft)	0.094
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.180613567
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.5694
Undeveloped Runoff Coefficient (Cu)	0.7836
Developed Runoff Coefficient (Cd)	0.8046
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	38.6768
Burned Peak Flow Rate (cfs)	38.6768
24-Hr Clear Runoff Volume (ac-ft)	2.7025
24-Hr Clear Runoff Volume (cu-ft)	117721.0102



Peak Flow Hydrologic Analysis

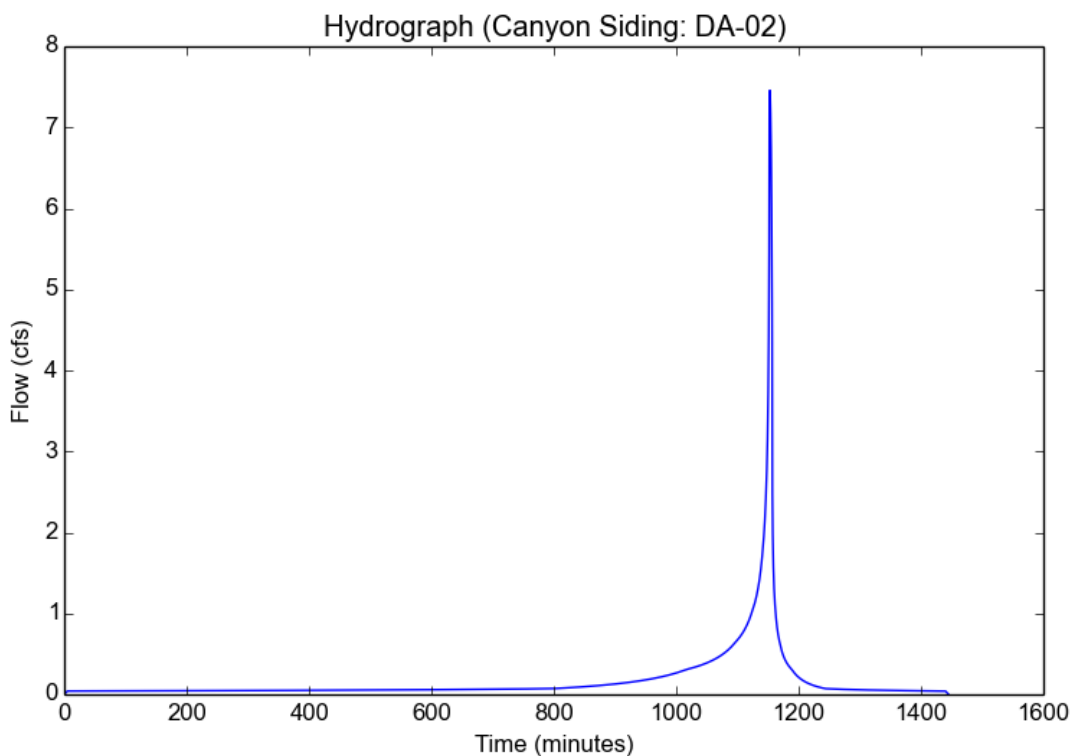
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-02
Area (ac)	1.89
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.15
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.022686757
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.9783
Undeveloped Runoff Coefficient (Cu)	0.79
Developed Runoff Coefficient (Cd)	0.7925
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	7.4564
Burned Peak Flow Rate (cfs)	7.4564
24-Hr Clear Runoff Volume (ac-ft)	0.3531
24-Hr Clear Runoff Volume (cu-ft)	15379.9572



Peak Flow Hydrologic Analysis

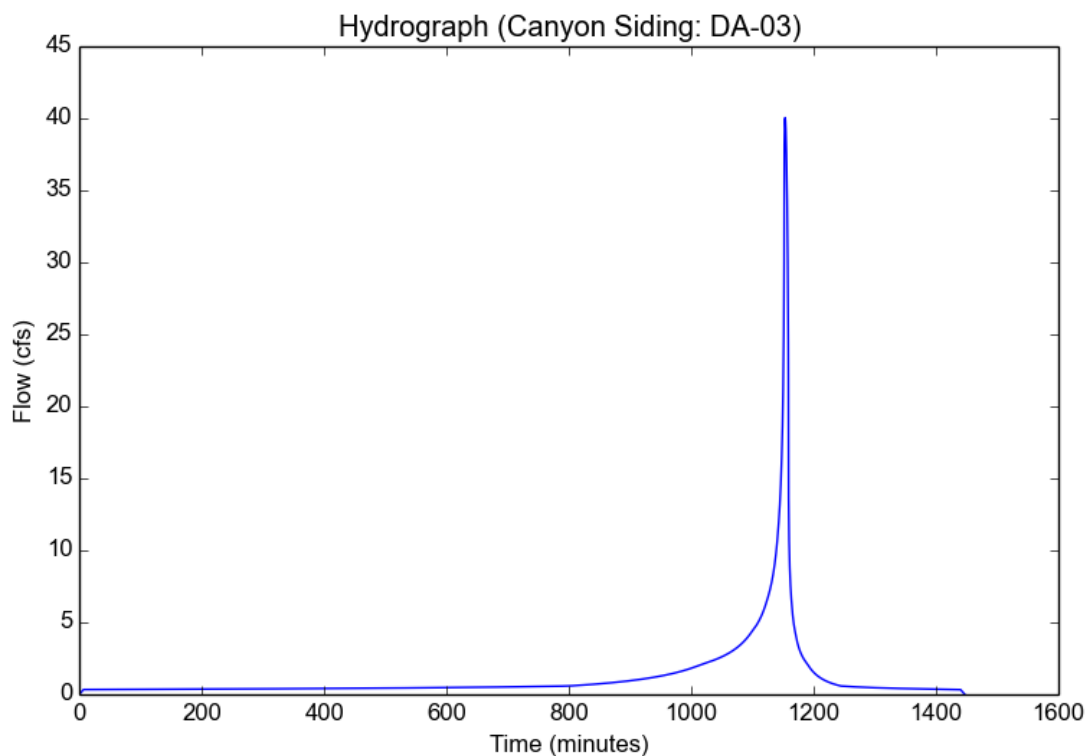
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-03
Area (ac)	12.03
Flow Path Length (ft)	1176.0
Flow Path Slope (vft/hft)	0.109
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.064263505
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.2501
Undeveloped Runoff Coefficient (Cu)	0.7752
Developed Runoff Coefficient (Cd)	0.7832
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	40.046
Burned Peak Flow Rate (cfs)	40.046
24-Hr Clear Runoff Volume (ac-ft)	2.4682
24-Hr Clear Runoff Volume (cu-ft)	107516.8833



Peak Flow Hydrologic Analysis

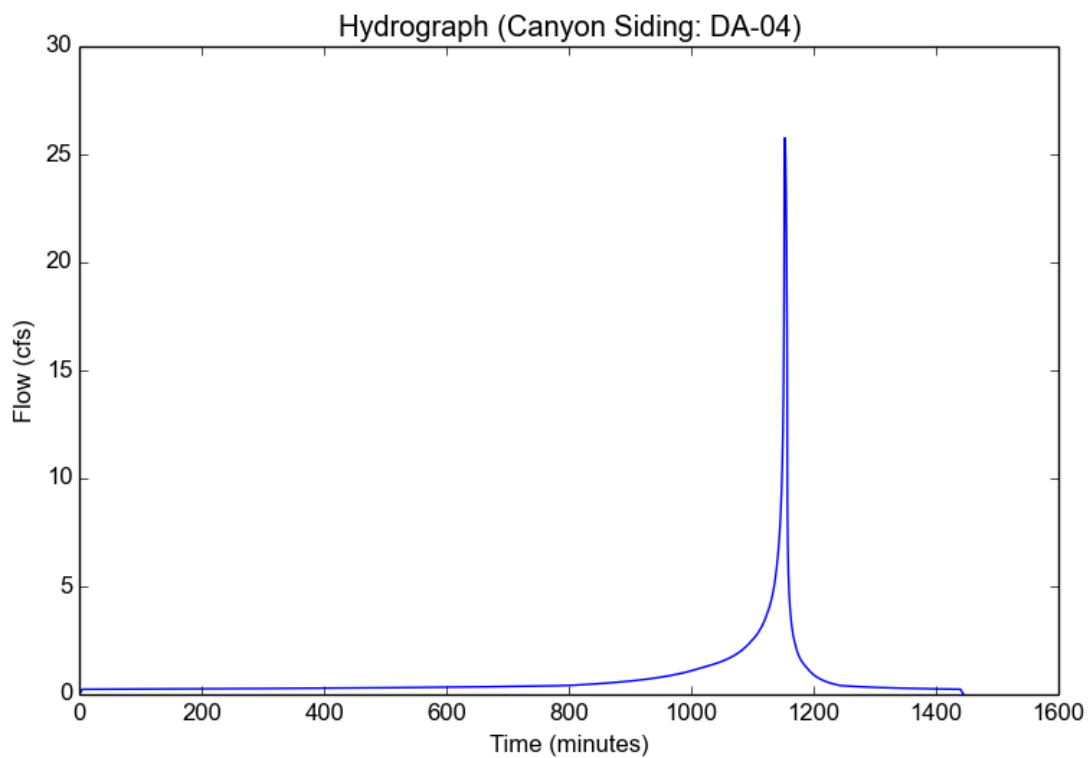
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-04
Area (ac)	6.44
Flow Path Length (ft)	927.0
Flow Path Slope (vft/hft)	0.223
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.123940231
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.9783
Undeveloped Runoff Coefficient (Cu)	0.79
Developed Runoff Coefficient (Cd)	0.8036
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	25.764
Burned Peak Flow Rate (cfs)	25.764
24-Hr Clear Runoff Volume (ac-ft)	1.4925
24-Hr Clear Runoff Volume (cu-ft)	65014.0486



Peak Flow Hydrologic Analysis

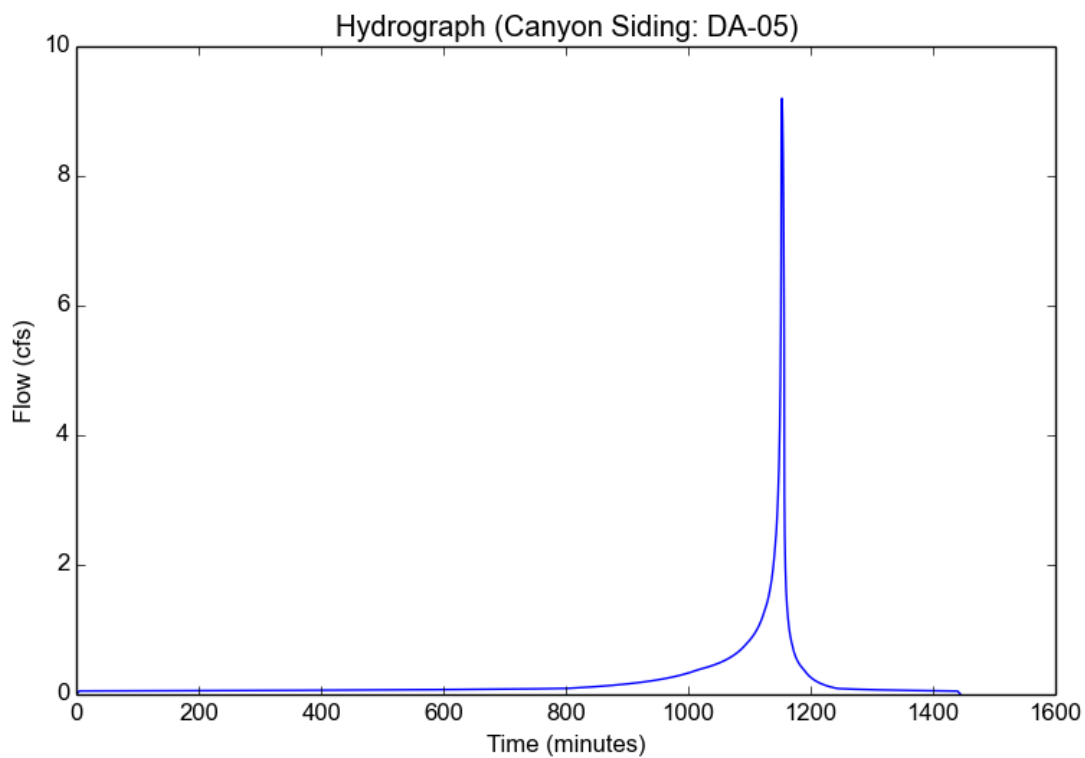
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-05
Area (ac)	2.33
Flow Path Length (ft)	622.0
Flow Path Slope (vft/hft)	0.248
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.027818059
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.9783
Undeveloped Runoff Coefficient (Cu)	0.79
Developed Runoff Coefficient (Cd)	0.793
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	9.1988
Burned Peak Flow Rate (cfs)	9.1988
24-Hr Clear Runoff Volume (ac-ft)	0.4406
24-Hr Clear Runoff Volume (cu-ft)	19191.6525



Peak Flow Hydrologic Analysis

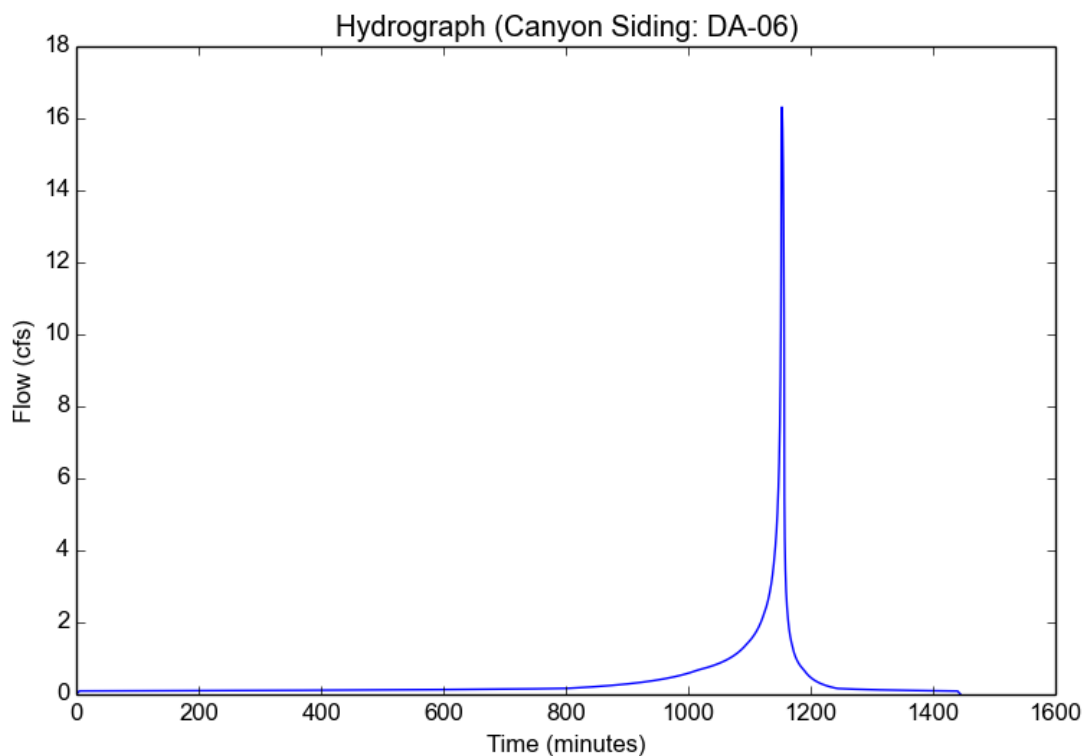
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-06
Area (ac)	4.13
Flow Path Length (ft)	792.0
Flow Path Slope (vft/hft)	0.24
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.030867097
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.9783
Undeveloped Runoff Coefficient (Cu)	0.79
Developed Runoff Coefficient (Cd)	0.7934
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	16.312
Burned Peak Flow Rate (cfs)	16.312
24-Hr Clear Runoff Volume (ac-ft)	0.7865
24-Hr Clear Runoff Volume (cu-ft)	34261.307



Peak Flow Hydrologic Analysis

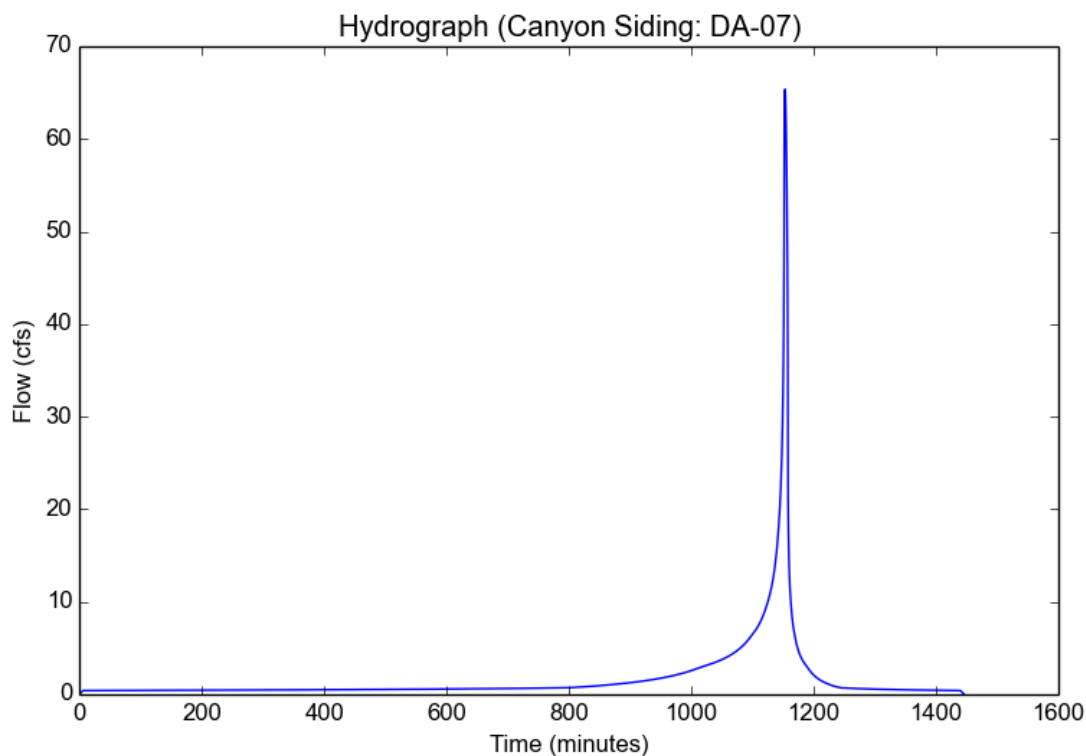
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-07
Area (ac)	18.18
Flow Path Length (ft)	1244.0
Flow Path Slope (vft/hft)	0.208
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.028608006
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.5694
Undeveloped Runoff Coefficient (Cu)	0.7836
Developed Runoff Coefficient (Cd)	0.7869
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	65.3684
Burned Peak Flow Rate (cfs)	65.3684
24-Hr Clear Runoff Volume (ac-ft)	3.4436
24-Hr Clear Runoff Volume (cu-ft)	150001.3545



Peak Flow Hydrologic Analysis

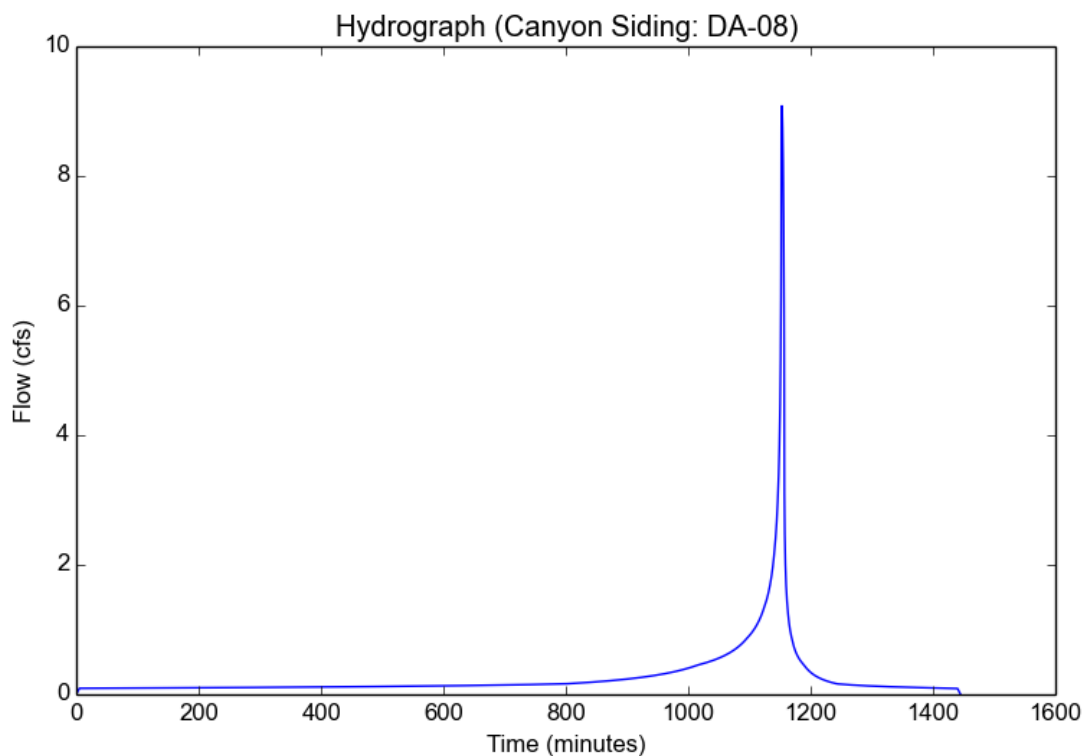
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-08
Area (ac)	2.26
Flow Path Length (ft)	472.0
Flow Path Slope (vft/hft)	0.438
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.156010454
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.9783
Undeveloped Runoff Coefficient (Cu)	0.79
Developed Runoff Coefficient (Cd)	0.8071
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	9.0811
Burned Peak Flow Rate (cfs)	9.0811
24-Hr Clear Runoff Volume (ac-ft)	0.5559
24-Hr Clear Runoff Volume (cu-ft)	24216.9148



Peak Flow Hydrologic Analysis

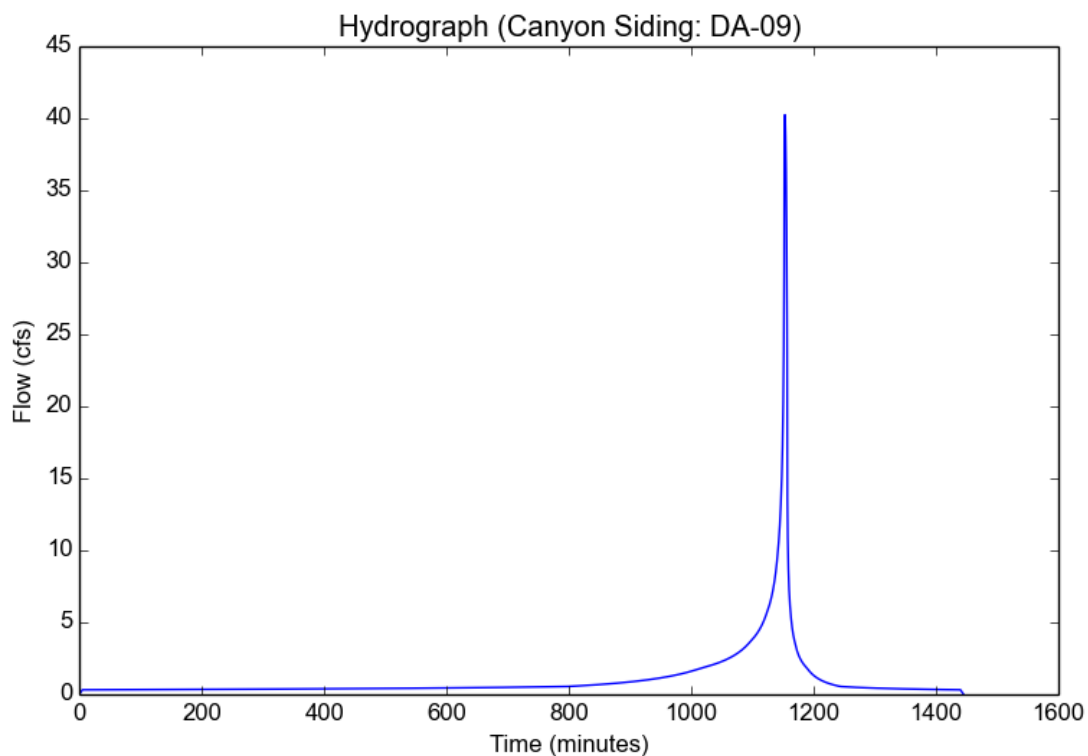
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-09
Area (ac)	10.11
Flow Path Length (ft)	1025.0
Flow Path Slope (vft/hft)	0.202
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.087673207
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.9783
Undeveloped Runoff Coefficient (Cu)	0.79
Developed Runoff Coefficient (Cd)	0.7996
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	40.2455
Burned Peak Flow Rate (cfs)	40.2455
24-Hr Clear Runoff Volume (ac-ft)	2.1803
24-Hr Clear Runoff Volume (cu-ft)	94974.3638



Peak Flow Hydrologic Analysis

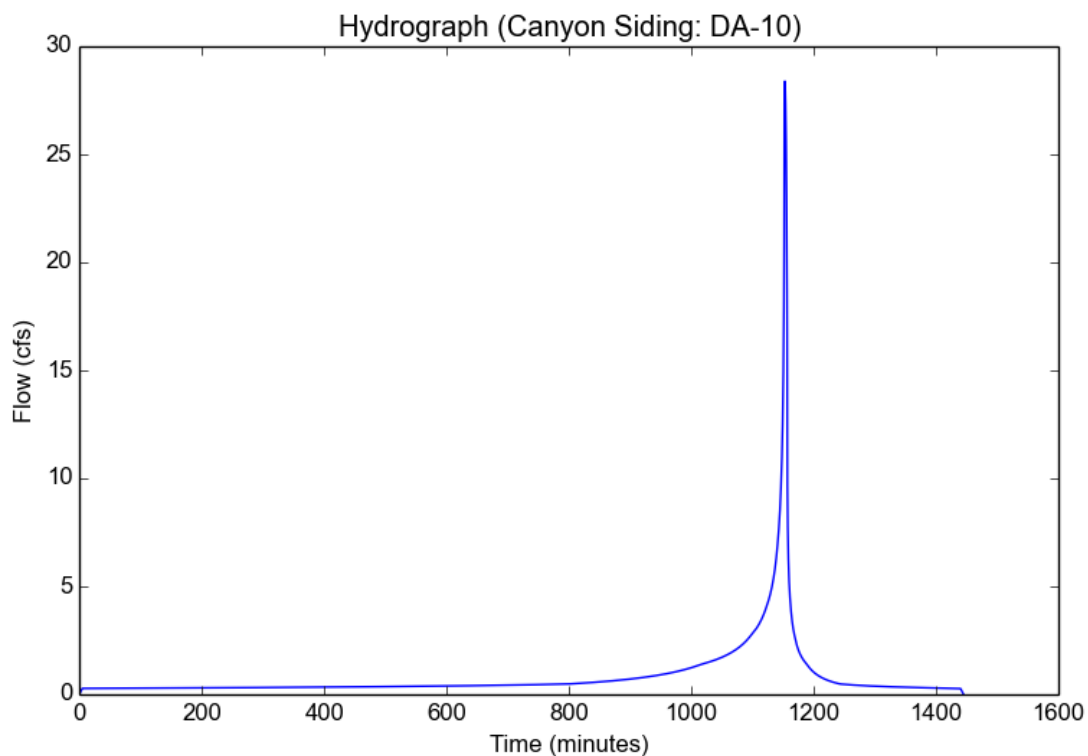
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-10
Area (ac)	7.08
Flow Path Length (ft)	887.0
Flow Path Slope (vft/hft)	0.226
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.140092863
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.9783
Undeveloped Runoff Coefficient (Cu)	0.79
Developed Runoff Coefficient (Cd)	0.8054
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	28.387
Burned Peak Flow Rate (cfs)	28.387
24-Hr Clear Runoff Volume (ac-ft)	1.6916
24-Hr Clear Runoff Volume (cu-ft)	73686.3138



Peak Flow Hydrologic Analysis

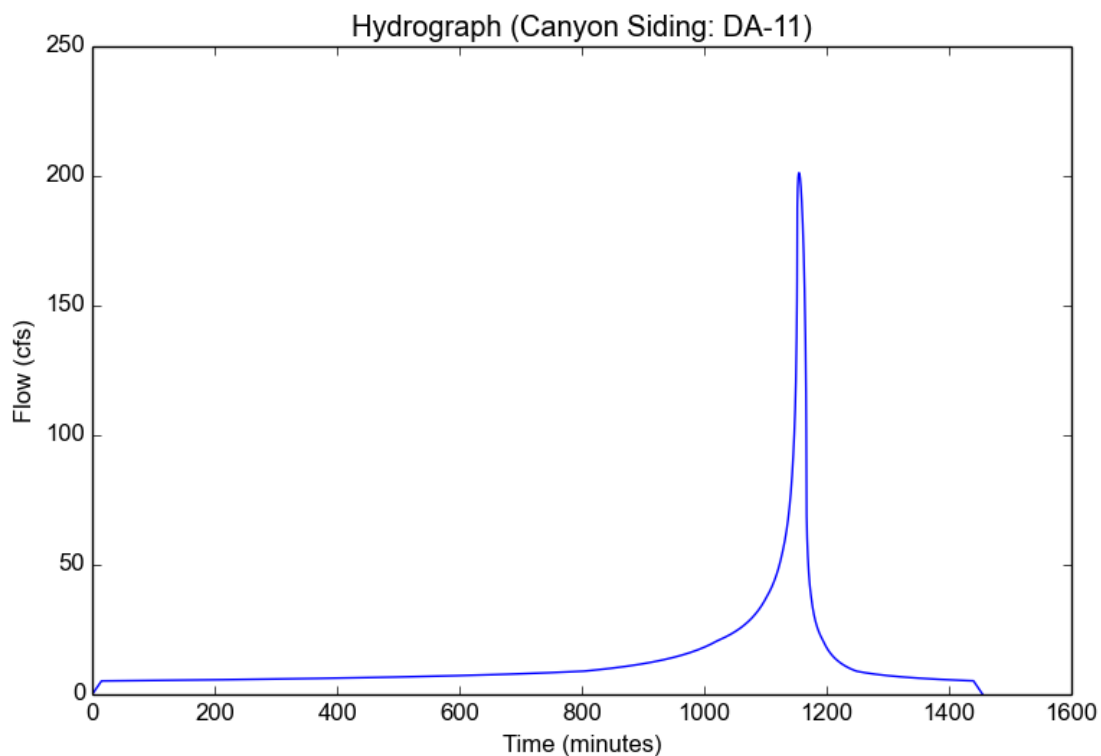
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-11
Area (ac)	87.33
Flow Path Length (ft)	4047.0
Flow Path Slope (vft/hft)	0.101
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.276140604
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	2.9705
Undeveloped Runoff Coefficient (Cu)	0.7284
Developed Runoff Coefficient (Cd)	0.7758
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	201.2417
Burned Peak Flow Rate (cfs)	201.2417
24-Hr Clear Runoff Volume (ac-ft)	26.101
24-Hr Clear Runoff Volume (cu-ft)	1136961.093



Peak Flow Hydrologic Analysis

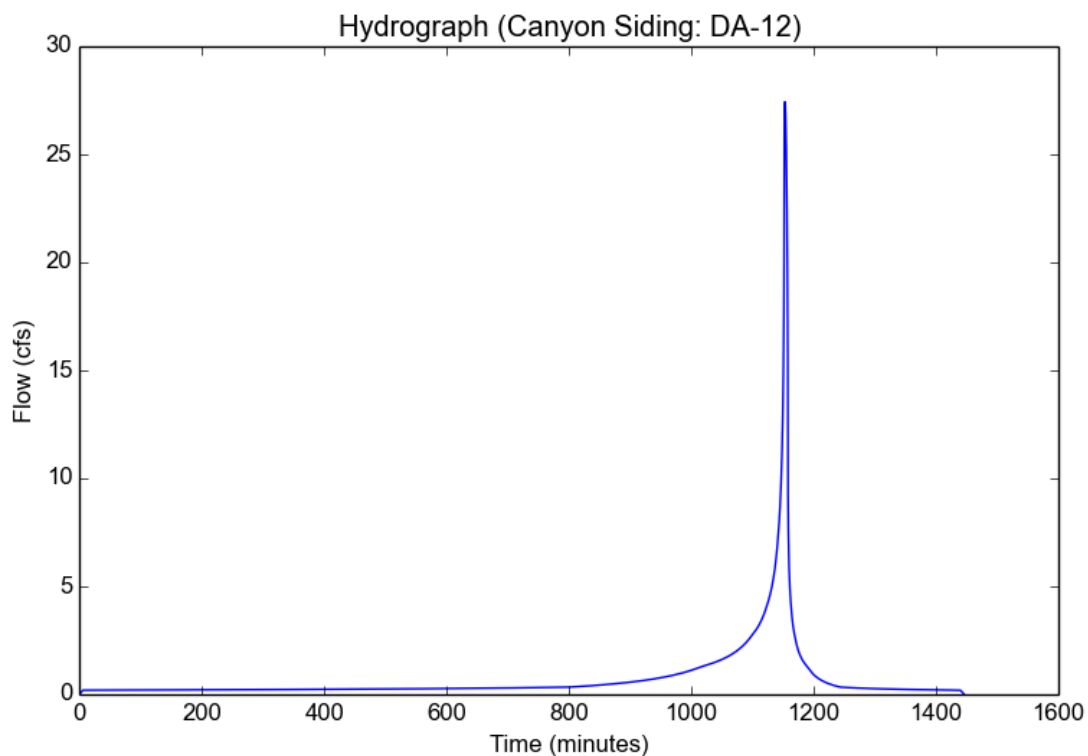
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-12
Area (ac)	7.61
Flow Path Length (ft)	1189.0
Flow Path Slope (vft/hft)	0.193
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.046514217
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	4.5694
Undeveloped Runoff Coefficient (Cu)	0.7836
Developed Runoff Coefficient (Cd)	0.789
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	27.4352
Burned Peak Flow Rate (cfs)	27.4352
24-Hr Clear Runoff Volume (ac-ft)	1.5019
24-Hr Clear Runoff Volume (cu-ft)	65424.3078



Peak Flow Hydrologic Analysis

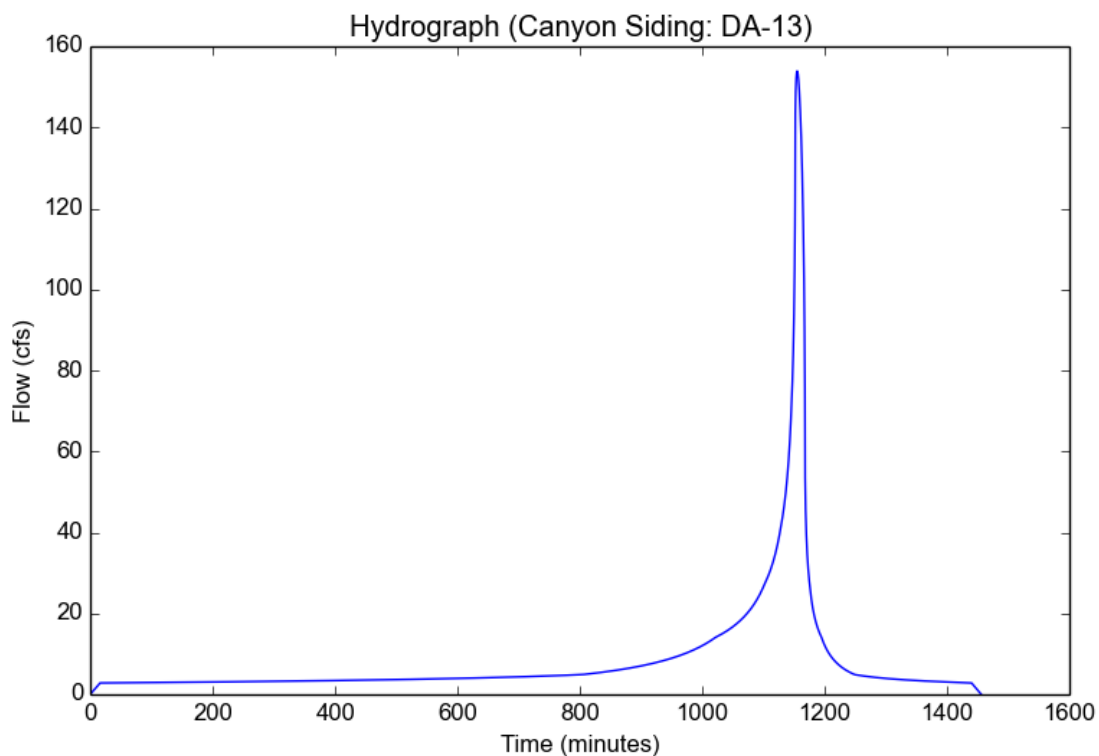
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-13
Area (ac)	71.28
Flow Path Length (ft)	4280.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.142666804
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	2.8818
Undeveloped Runoff Coefficient (Cu)	0.7241
Developed Runoff Coefficient (Cd)	0.7492
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	153.9007
Burned Peak Flow Rate (cfs)	153.9007
24-Hr Clear Runoff Volume (ac-ft)	17.0724
24-Hr Clear Runoff Volume (cu-ft)	743672.6805



Peak Flow Hydrologic Analysis

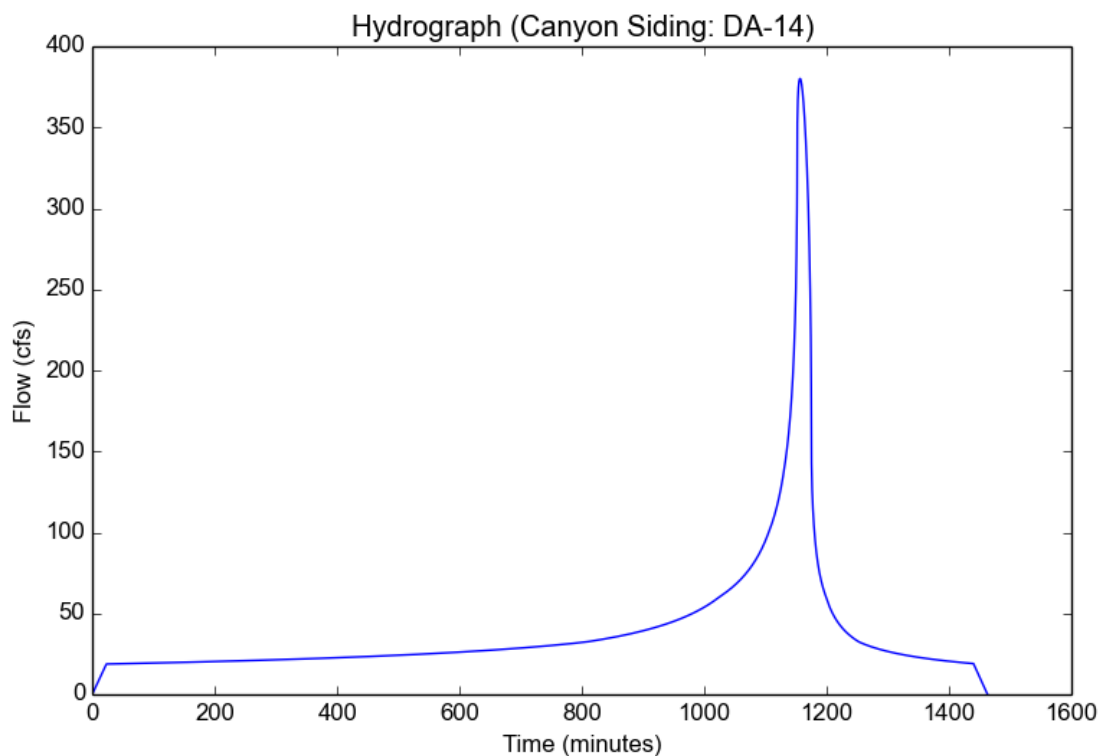
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-14
Area (ac)	194.19
Flow Path Length (ft)	6555.0
Flow Path Slope (vft/hft)	0.047
50-yr Rainfall Depth (in)	8.344
Percent Impervious	0.526484739
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	2.4299
Undeveloped Runoff Coefficient (Cu)	0.7008
Developed Runoff Coefficient (Cd)	0.8057
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	380.1528
Burned Peak Flow Rate (cfs)	380.1528
24-Hr Clear Runoff Volume (ac-ft)	79.6133
24-Hr Clear Runoff Volume (cu-ft)	3467955.9388



Peak Flow Hydrologic Analysis

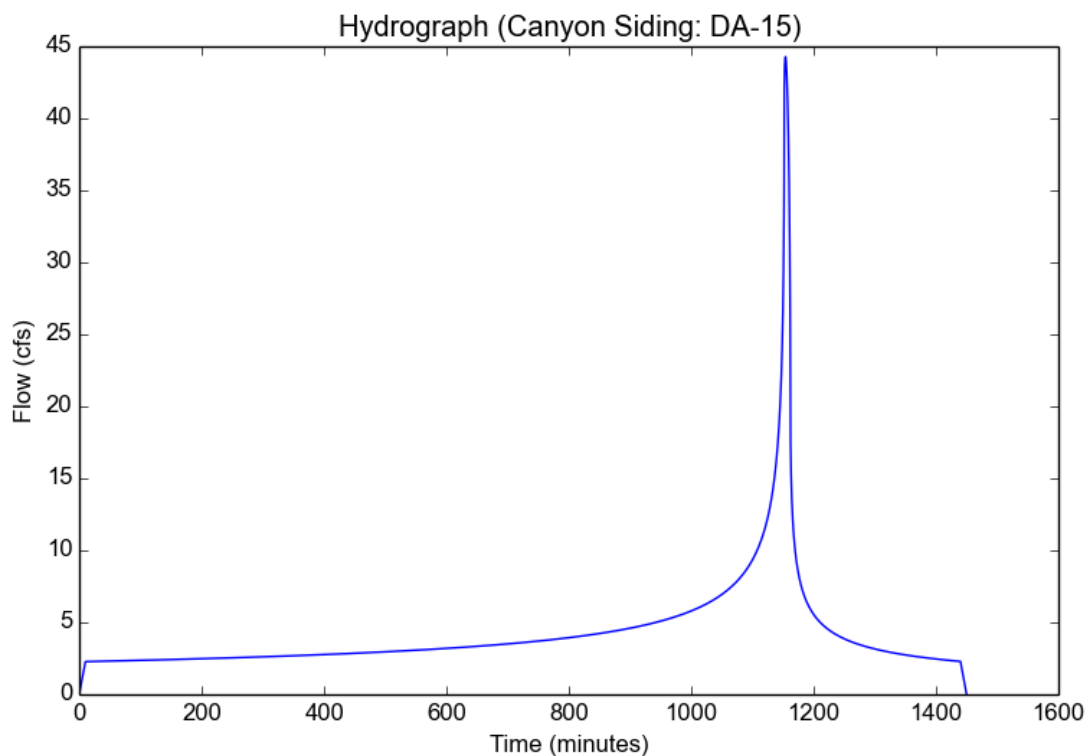
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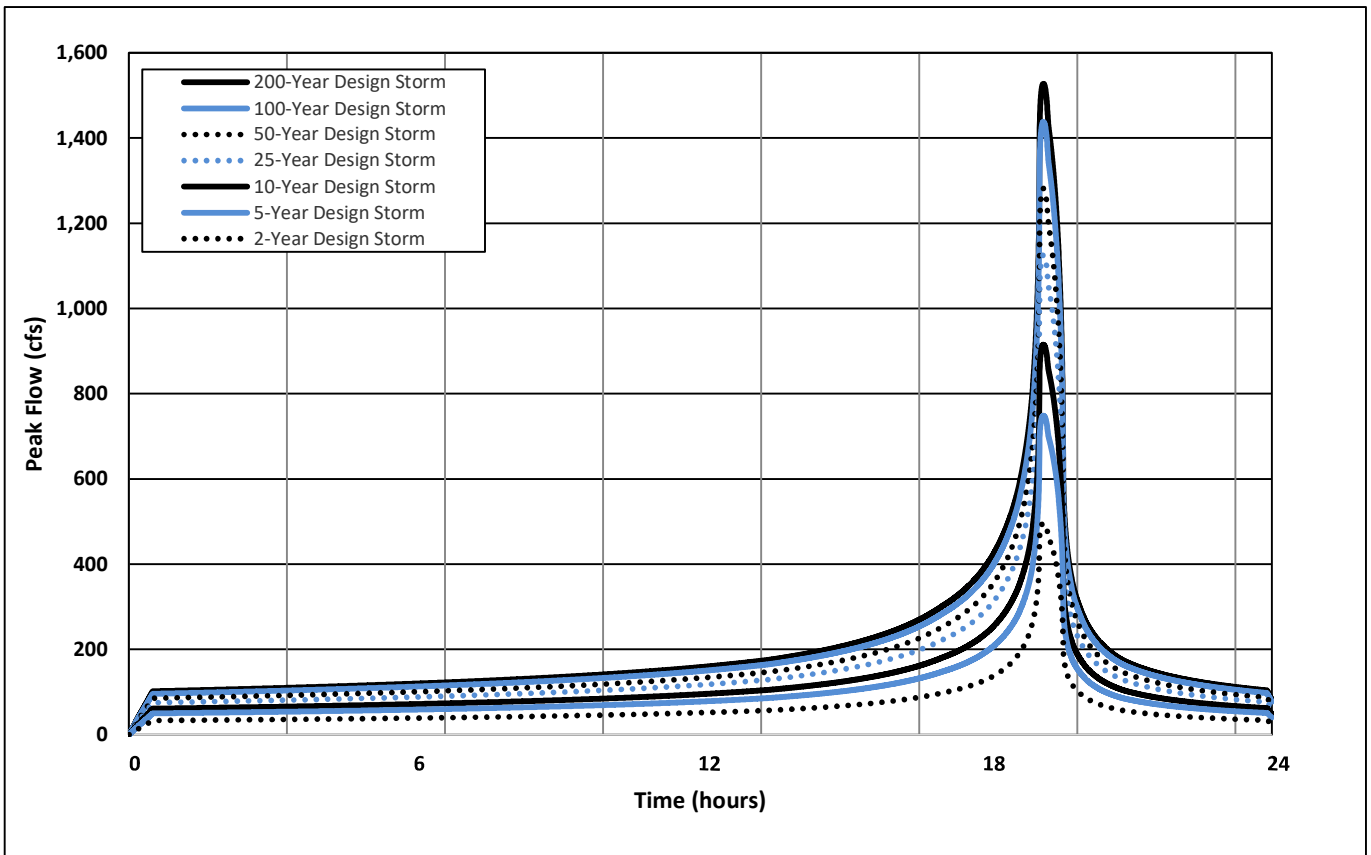
Input Parameters

Project Name	Canyon Siding
Subarea ID	DA-15
Area (ac)	13.69
Flow Path Length (ft)	2174.0
Flow Path Slope (vft/hft)	0.069
50-yr Rainfall Depth (in)	8.344
Percent Impervious	1.0
Soil Type	97
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	8.344
Peak Intensity (in/hr)	3.5941
Undeveloped Runoff Coefficient (Cu)	0.7562
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	44.2832
Burned Peak Flow Rate (cfs)	44.2832
24-Hr Clear Runoff Volume (ac-ft)	8.4964
24-Hr Clear Runoff Volume (cu-ft)	370103.5923





Peak Flow Hydrologic Analysis

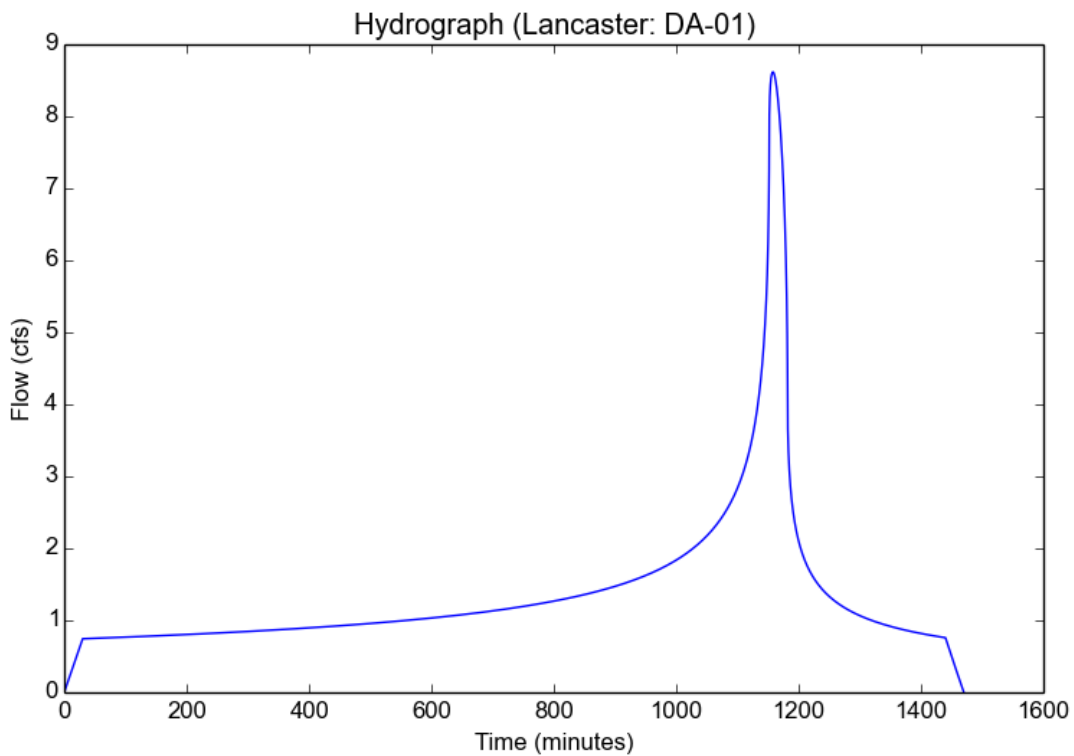
File location: C:/Users/Watearth - Will Hahn/Desktop/Lancaster Report E.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.98
Soil Type	124
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.0836
Peak Intensity (in/hr)	0.2785
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.884
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	8.6171
Burned Peak Flow Rate (cfs)	8.6171
24-Hr Clear Runoff Volume (ac-ft)	2.7708
24-Hr Clear Runoff Volume (cu-ft)	120697.0882



Peak Flow Hydrologic Analysis

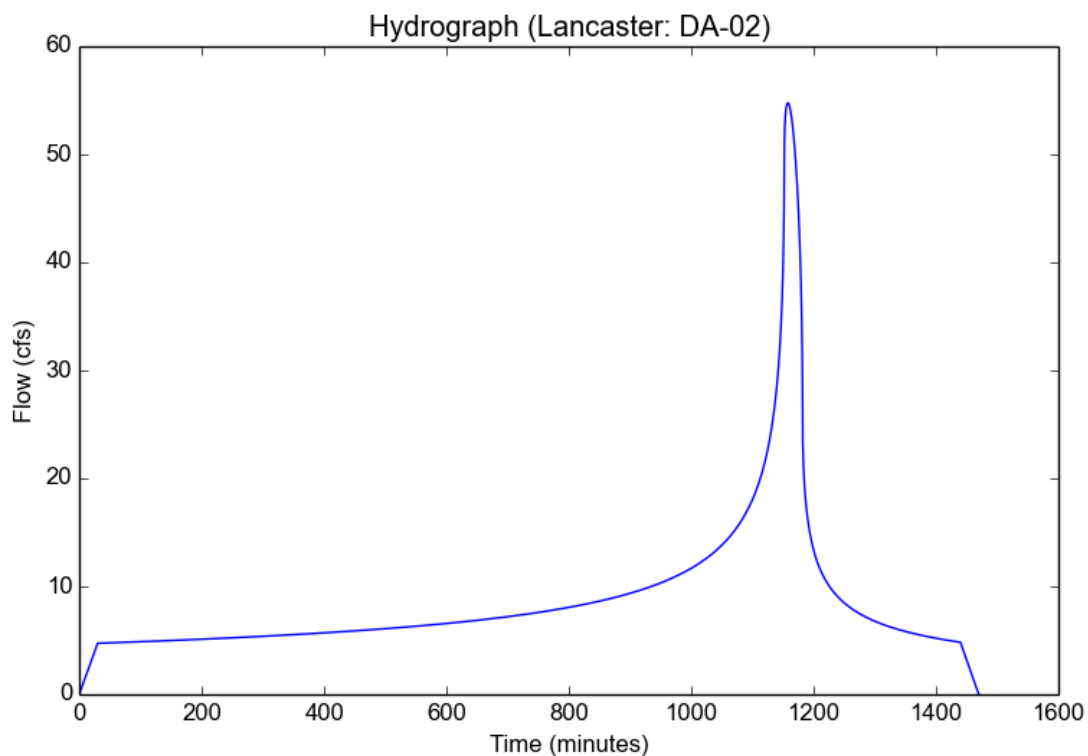
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.82
Soil Type	120
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.0836
Peak Intensity (in/hr)	0.2785
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.756
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	54.765
Burned Peak Flow Rate (cfs)	54.765
24-Hr Clear Runoff Volume (ac-ft)	17.6097
24-Hr Clear Runoff Volume (cu-ft)	767076.4172



Peak Flow Hydrologic Analysis

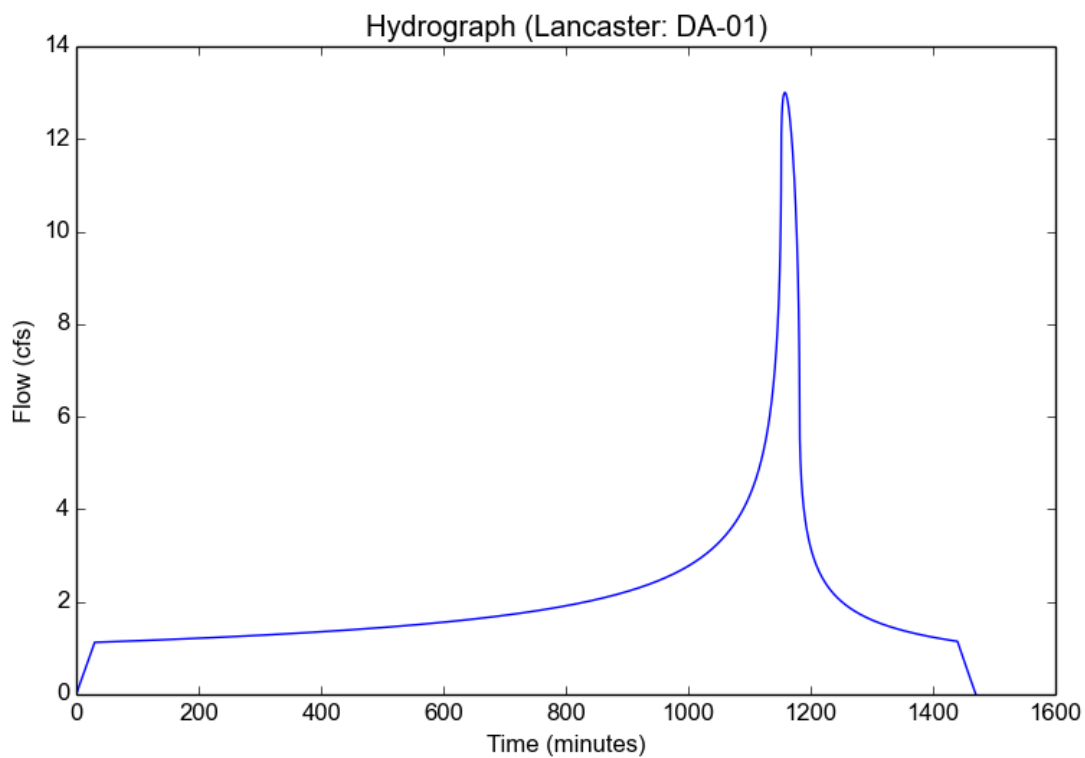
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.98
Soil Type	124
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	1.6352
Peak Intensity (in/hr)	0.4203
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.884
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	13.0036
Burned Peak Flow Rate (cfs)	13.0036
24-Hr Clear Runoff Volume (ac-ft)	4.1813
24-Hr Clear Runoff Volume (cu-ft)	182137.208



Peak Flow Hydrologic Analysis

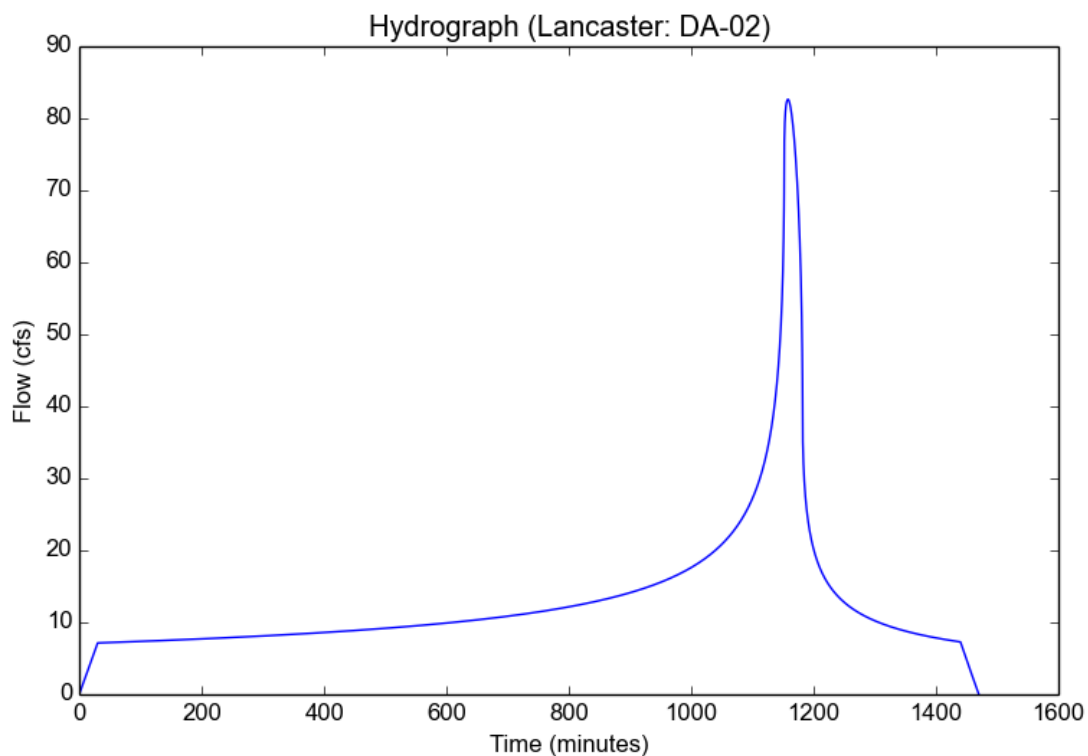
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.82
Soil Type	120
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	1.6352
Peak Intensity (in/hr)	0.4203
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.756
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	82.6428
Burned Peak Flow Rate (cfs)	82.6428
24-Hr Clear Runoff Volume (ac-ft)	26.5737
24-Hr Clear Runoff Volume (cu-ft)	1157552.0094



Peak Flow Hydrologic Analysis

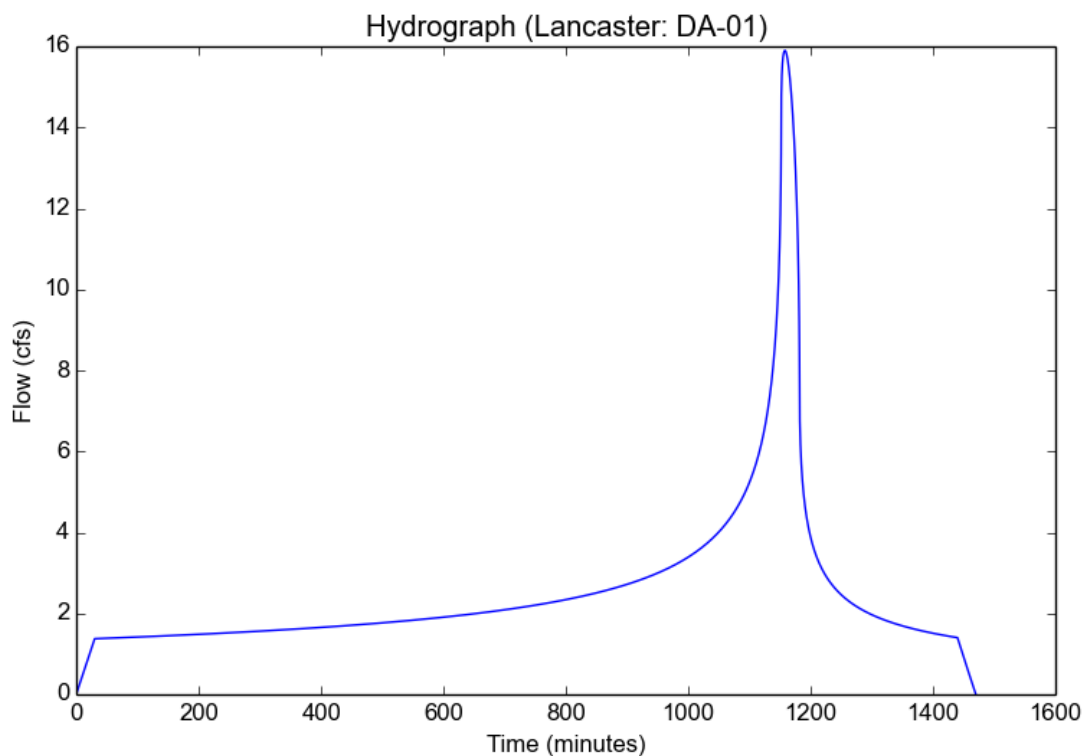
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.98
Soil Type	124
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	1.9992
Peak Intensity (in/hr)	0.5138
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.884
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	15.8982
Burned Peak Flow Rate (cfs)	15.8982
24-Hr Clear Runoff Volume (ac-ft)	5.1121
24-Hr Clear Runoff Volume (cu-ft)	222681.4495



Peak Flow Hydrologic Analysis

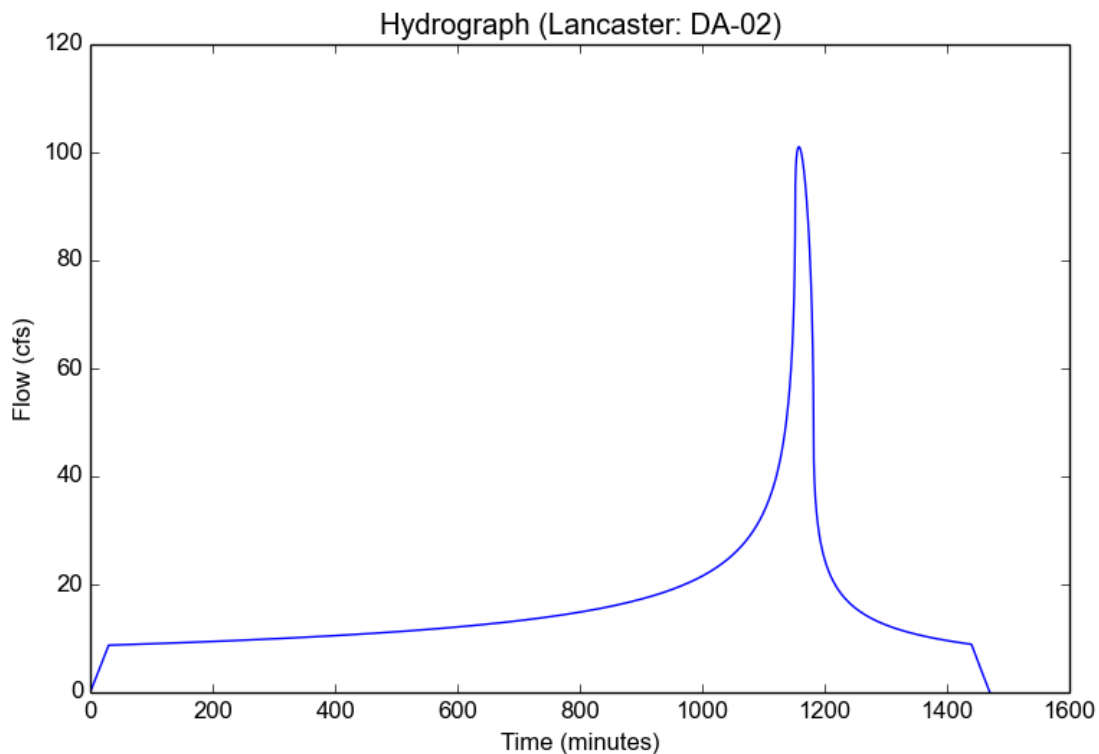
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.82
Soil Type	120
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	1.9992
Peak Intensity (in/hr)	0.5138
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.756
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	101.0393
Burned Peak Flow Rate (cfs)	101.0393
24-Hr Clear Runoff Volume (ac-ft)	32.4891
24-Hr Clear Runoff Volume (cu-ft)	1415226.2581



Peak Flow Hydrologic Analysis

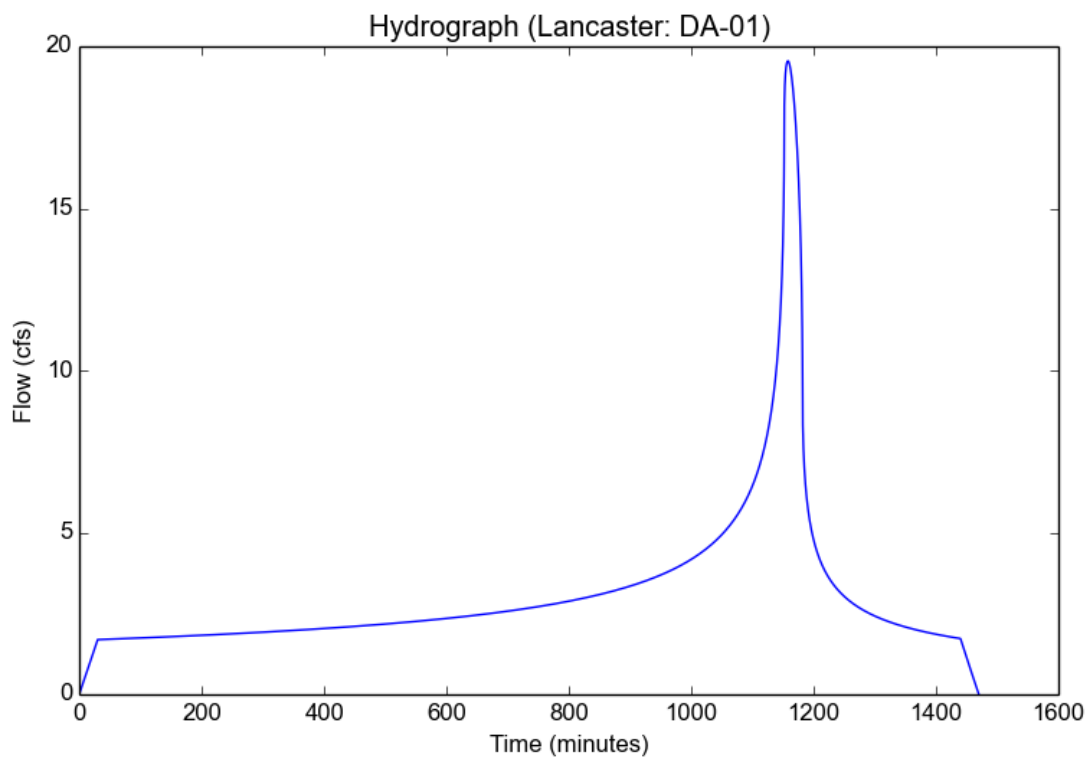
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.98
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	2.4584
Peak Intensity (in/hr)	0.6319
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.884
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	19.5499
Burned Peak Flow Rate (cfs)	19.5499
24-Hr Clear Runoff Volume (ac-ft)	6.2863
24-Hr Clear Runoff Volume (cu-ft)	273829.5695



Peak Flow Hydrologic Analysis

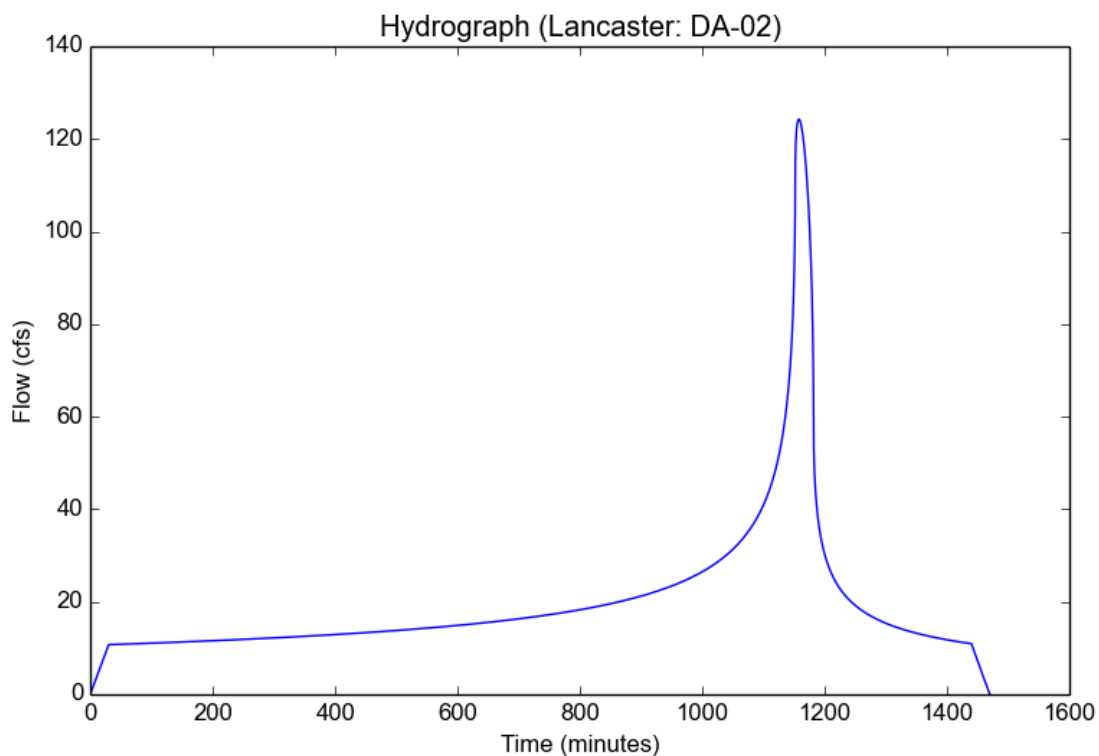
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Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.82
Soil Type	120
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	2.4584
Peak Intensity (in/hr)	0.6319
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.756
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	124.2473
Burned Peak Flow Rate (cfs)	124.2473
24-Hr Clear Runoff Volume (ac-ft)	39.9516
24-Hr Clear Runoff Volume (cu-ft)	1740292.2333



Peak Flow Hydrologic Analysis

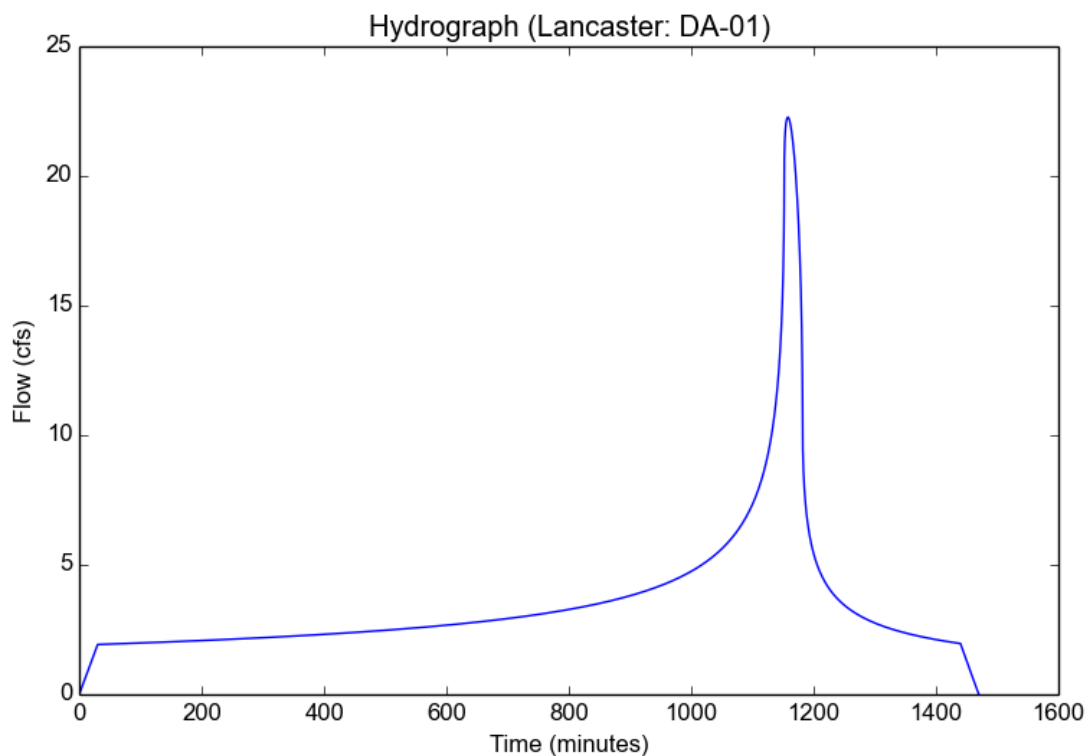
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.98
Soil Type	124
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.8
Peak Intensity (in/hr)	0.7197
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.884
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	22.2664
Burned Peak Flow Rate (cfs)	22.2664
24-Hr Clear Runoff Volume (ac-ft)	7.1598
24-Hr Clear Runoff Volume (cu-ft)	311878.7808



Peak Flow Hydrologic Analysis

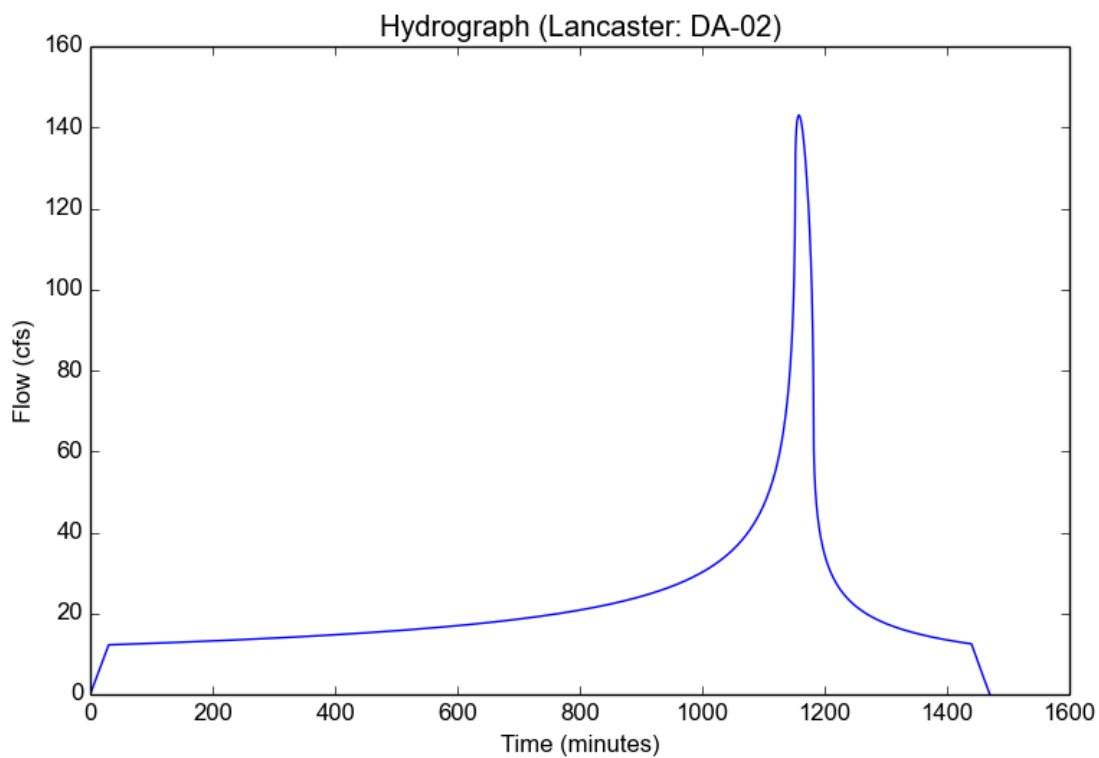
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.82
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.8
Peak Intensity (in/hr)	0.7197
Undeveloped Runoff Coefficient (Cu)	0.1447
Developed Runoff Coefficient (Cd)	0.764
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	143.0161
Burned Peak Flow Rate (cfs)	143.0161
24-Hr Clear Runoff Volume (ac-ft)	45.5296
24-Hr Clear Runoff Volume (cu-ft)	1983269.6527



Peak Flow Hydrologic Analysis

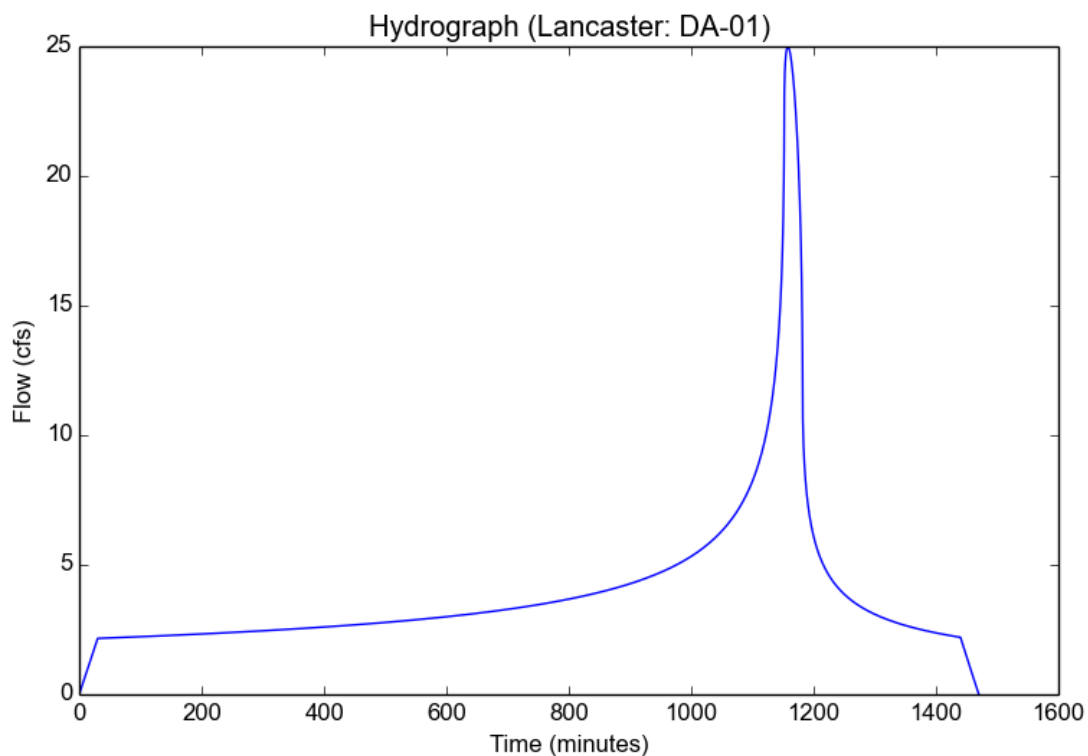
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.98
Soil Type	124
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	3.1416
Peak Intensity (in/hr)	0.8075
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.884
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	24.9829
Burned Peak Flow Rate (cfs)	24.9829
24-Hr Clear Runoff Volume (ac-ft)	8.0332
24-Hr Clear Runoff Volume (cu-ft)	349927.992



Peak Flow Hydrologic Analysis

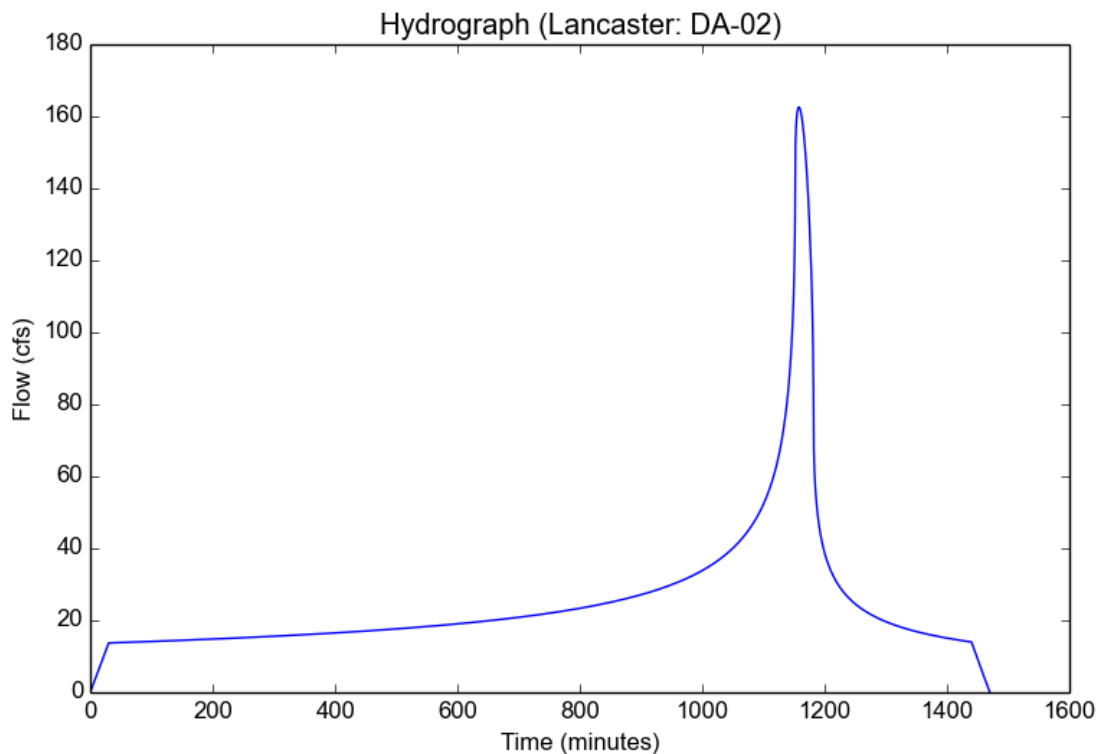
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.82
Soil Type	120
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	3.1416
Peak Intensity (in/hr)	0.8075
Undeveloped Runoff Coefficient (Cu)	0.2009
Developed Runoff Coefficient (Cd)	0.7742
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	162.5915
Burned Peak Flow Rate (cfs)	162.5915
24-Hr Clear Runoff Volume (ac-ft)	51.1427
24-Hr Clear Runoff Volume (cu-ft)	2227774.2825



Peak Flow Hydrologic Analysis

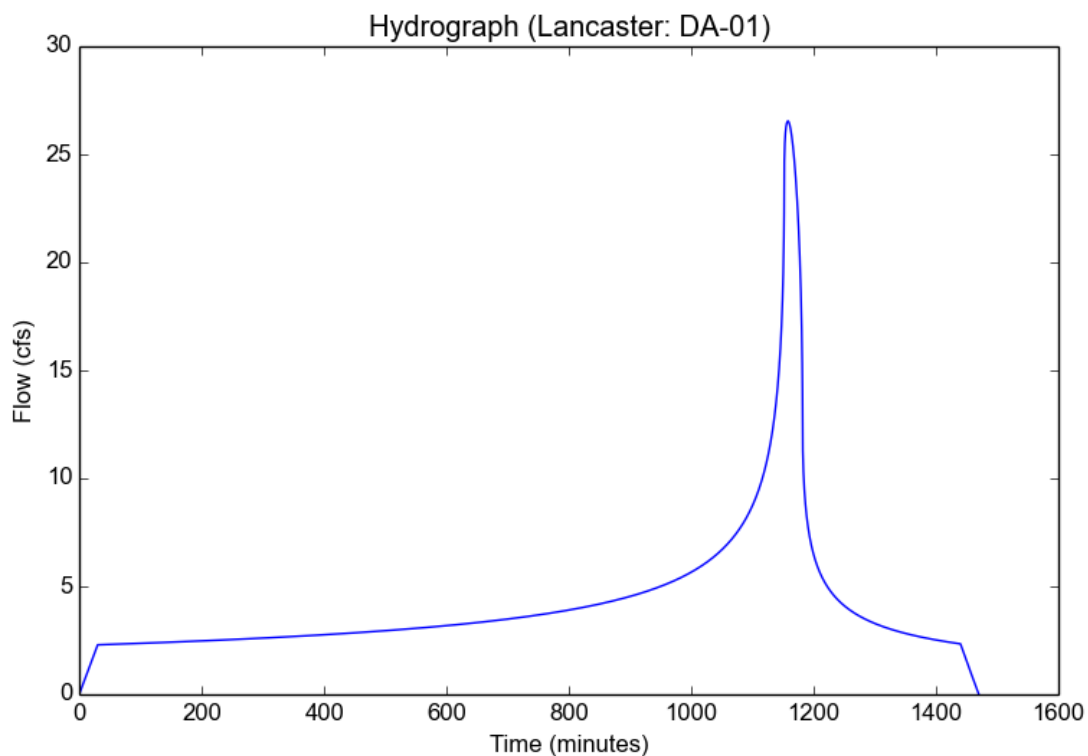
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	3.3376
Percent Impervious	0.98
Soil Type	124
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.3376
Peak Intensity (in/hr)	0.8578
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.884
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	26.5416
Burned Peak Flow Rate (cfs)	26.5416
24-Hr Clear Runoff Volume (ac-ft)	8.5344
24-Hr Clear Runoff Volume (cu-ft)	371759.5067



Peak Flow Hydrologic Analysis

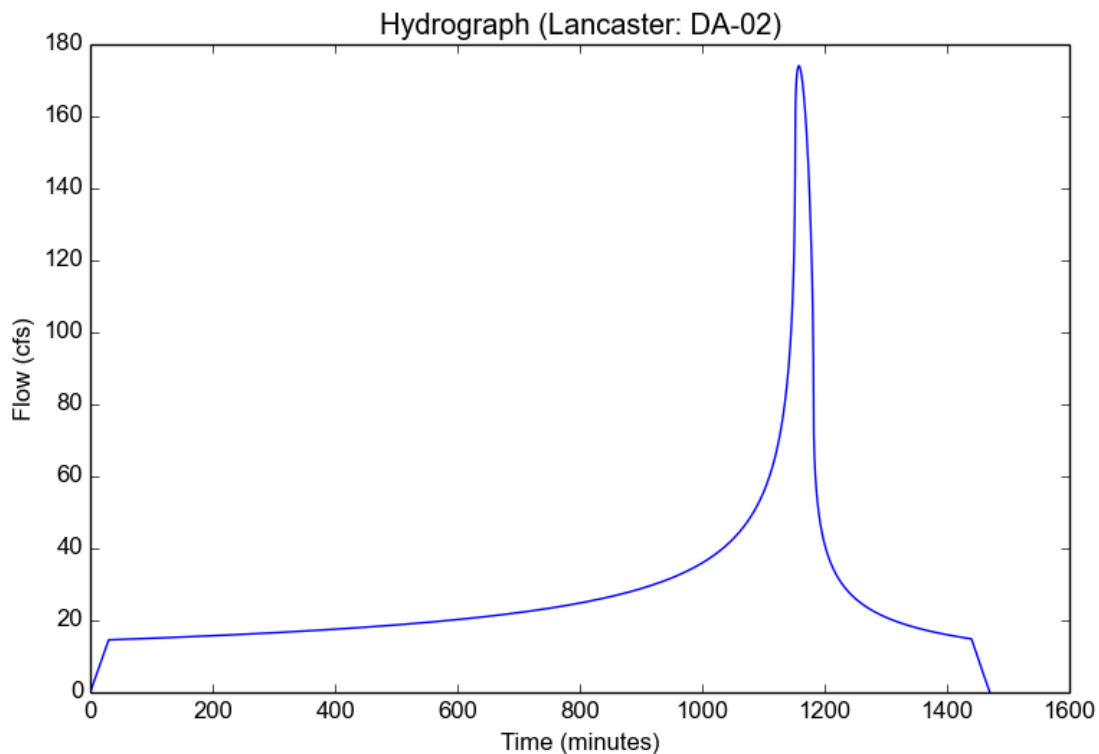
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	3.3376
Percent Impervious	0.82
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.3376
Peak Intensity (in/hr)	0.8578
Undeveloped Runoff Coefficient (Cu)	0.2332
Developed Runoff Coefficient (Cd)	0.78
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	174.0321
Burned Peak Flow Rate (cfs)	174.0321
24-Hr Clear Runoff Volume (ac-ft)	54.3736
24-Hr Clear Runoff Volume (cu-ft)	2368515.7974



Peak Flow Hydrologic Analysis

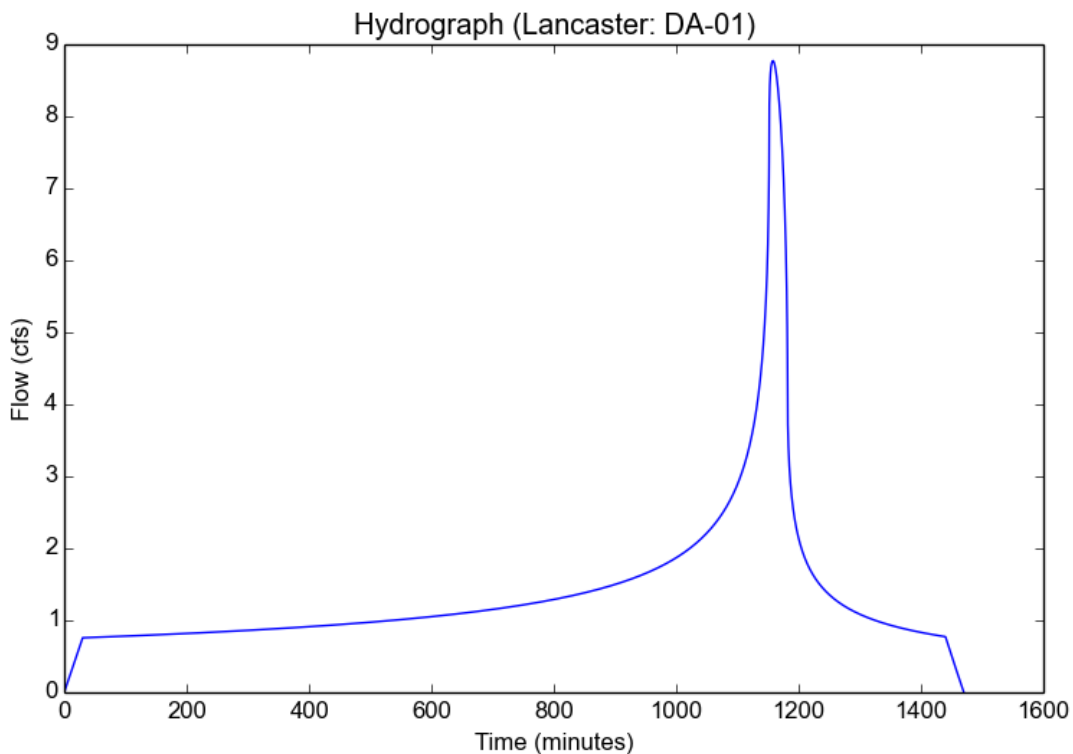
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	1.0
Soil Type	124
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.0836
Peak Intensity (in/hr)	0.2785
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	8.7731
Burned Peak Flow Rate (cfs)	8.7731
24-Hr Clear Runoff Volume (ac-ft)	2.821
24-Hr Clear Runoff Volume (cu-ft)	122881.6508



Peak Flow Hydrologic Analysis

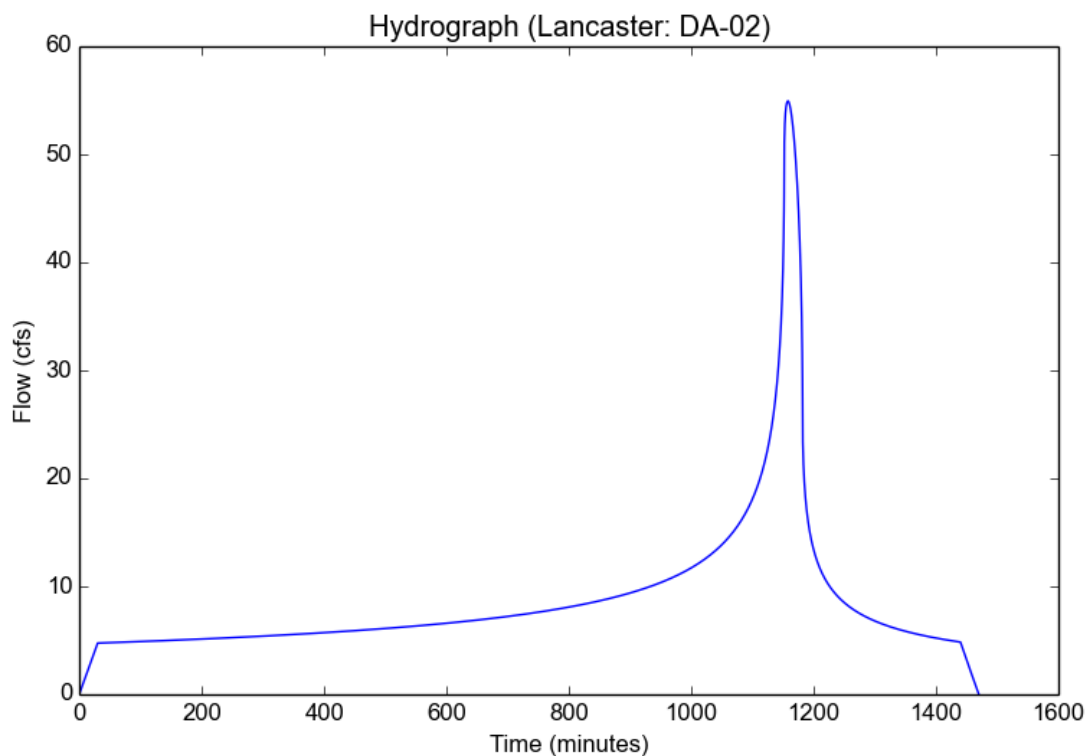
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.823
Soil Type	120
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.0836
Peak Intensity (in/hr)	0.2785
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.7584
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	54.9389
Burned Peak Flow Rate (cfs)	54.9389
24-Hr Clear Runoff Volume (ac-ft)	17.6656
24-Hr Clear Runoff Volume (cu-ft)	769511.5804



Peak Flow Hydrologic Analysis

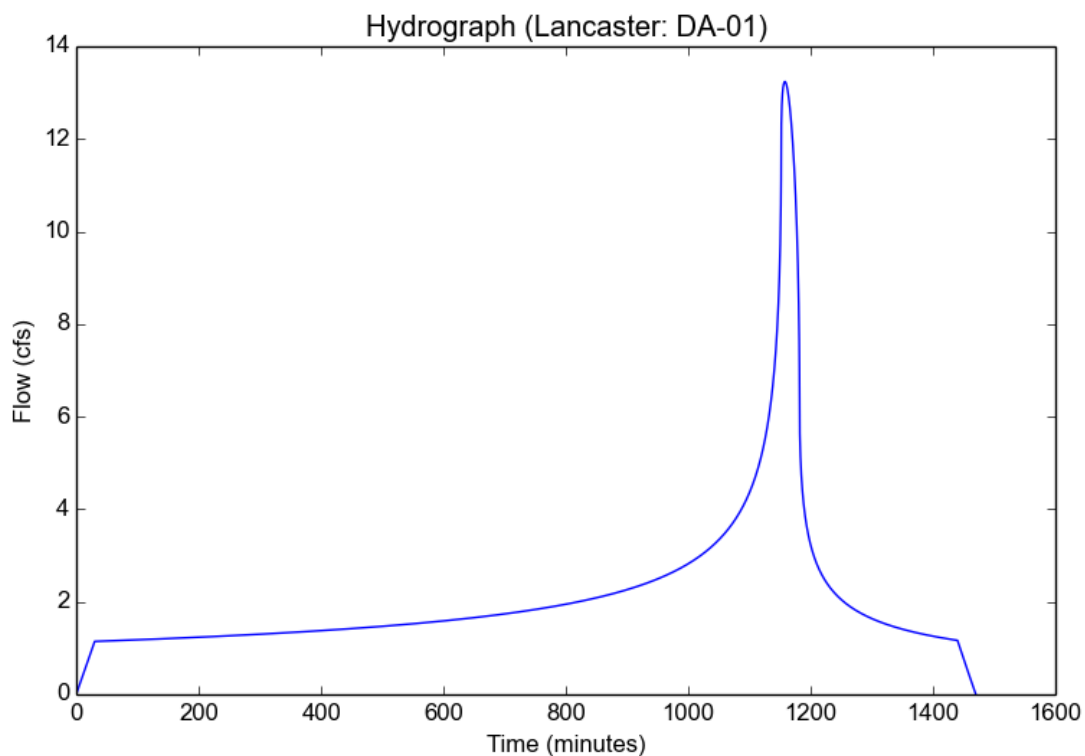
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	1.0
Soil Type	124
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	1.6352
Peak Intensity (in/hr)	0.4203
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	13.239
Burned Peak Flow Rate (cfs)	13.239
24-Hr Clear Runoff Volume (ac-ft)	4.257
24-Hr Clear Runoff Volume (cu-ft)	185433.809



Peak Flow Hydrologic Analysis

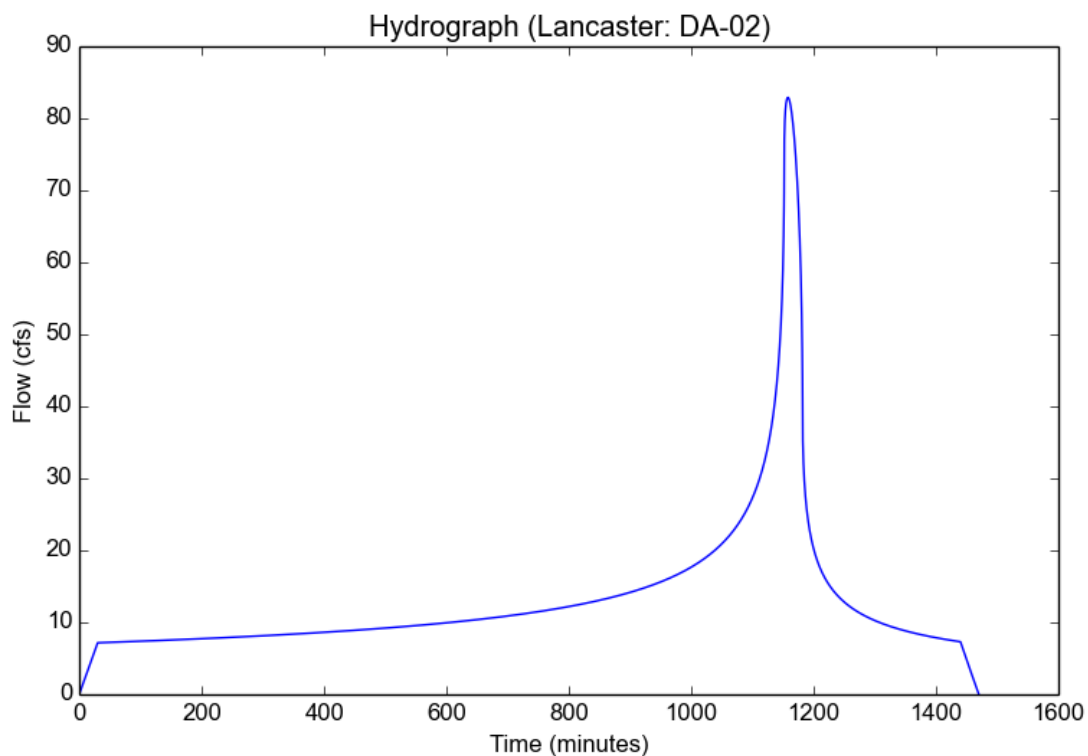
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.823
Soil Type	120
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	1.6352
Peak Intensity (in/hr)	0.4203
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.7584
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	82.9052
Burned Peak Flow Rate (cfs)	82.9052
24-Hr Clear Runoff Volume (ac-ft)	26.6581
24-Hr Clear Runoff Volume (cu-ft)	1161226.7777



Peak Flow Hydrologic Analysis

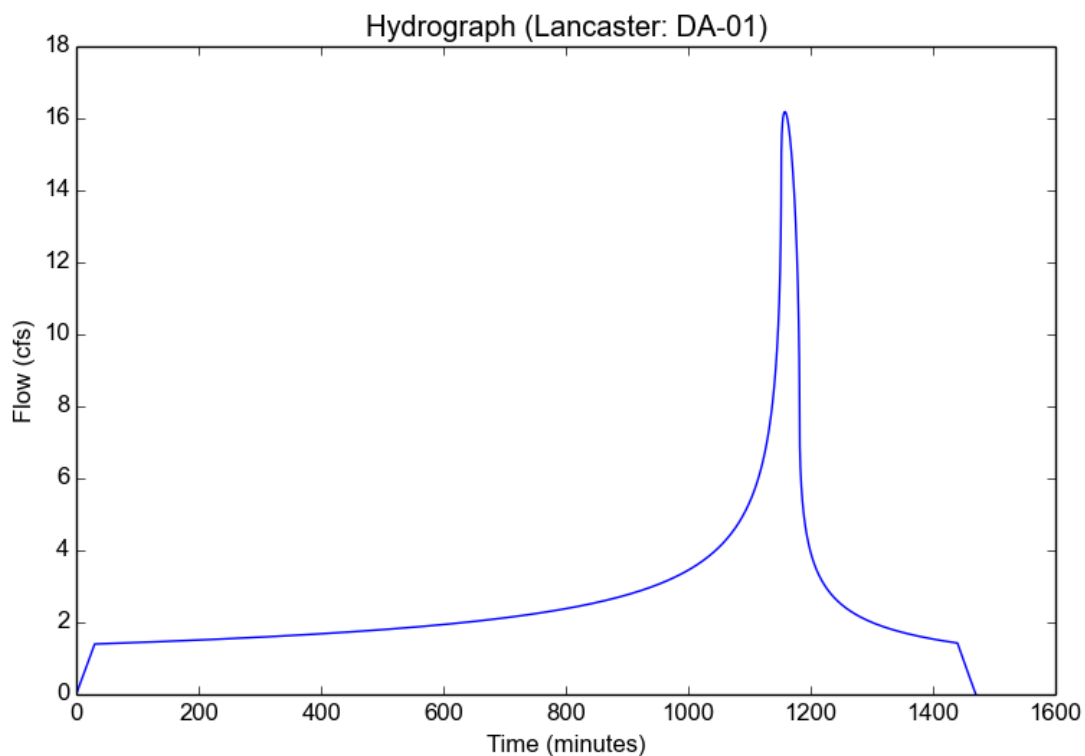
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	1.0
Soil Type	124
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	1.9992
Peak Intensity (in/hr)	0.5138
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	16.186
Burned Peak Flow Rate (cfs)	16.186
24-Hr Clear Runoff Volume (ac-ft)	5.2046
24-Hr Clear Runoff Volume (cu-ft)	226711.8829



Peak Flow Hydrologic Analysis

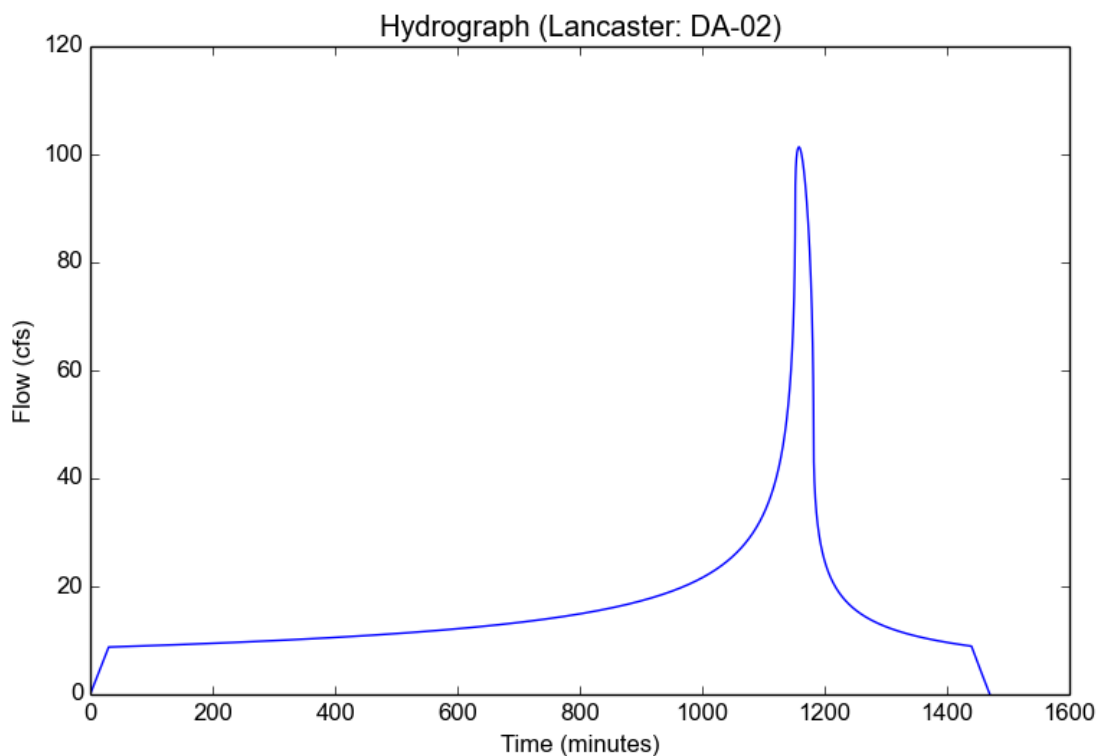
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.823
Soil Type	120
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	1.9992
Peak Intensity (in/hr)	0.5138
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.7584
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	101.3601
Burned Peak Flow Rate (cfs)	101.3601
24-Hr Clear Runoff Volume (ac-ft)	32.5923
24-Hr Clear Runoff Volume (cu-ft)	1419719.0399



Peak Flow Hydrologic Analysis

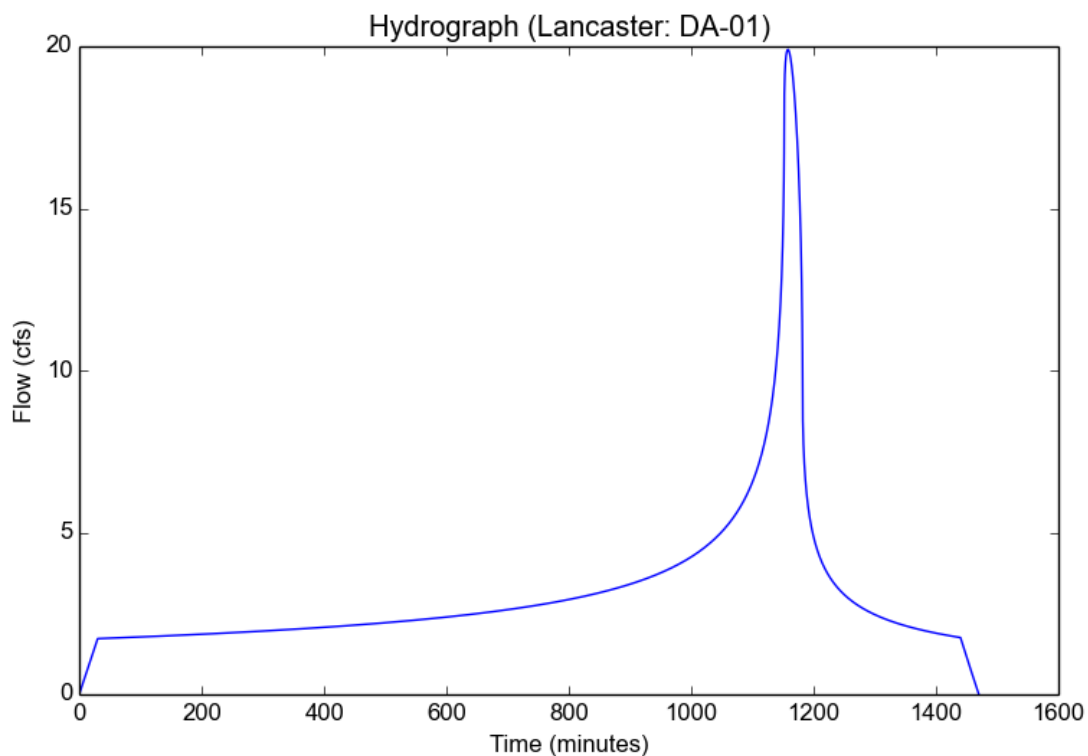
File location: C:/Users/Watearth - Will Hahn/Desktop/Lancaster Report P.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	1.0
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	2.4584
Peak Intensity (in/hr)	0.6319
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	19.9038
Burned Peak Flow Rate (cfs)	19.9038
24-Hr Clear Runoff Volume (ac-ft)	6.4
24-Hr Clear Runoff Volume (cu-ft)	278785.7608



Peak Flow Hydrologic Analysis

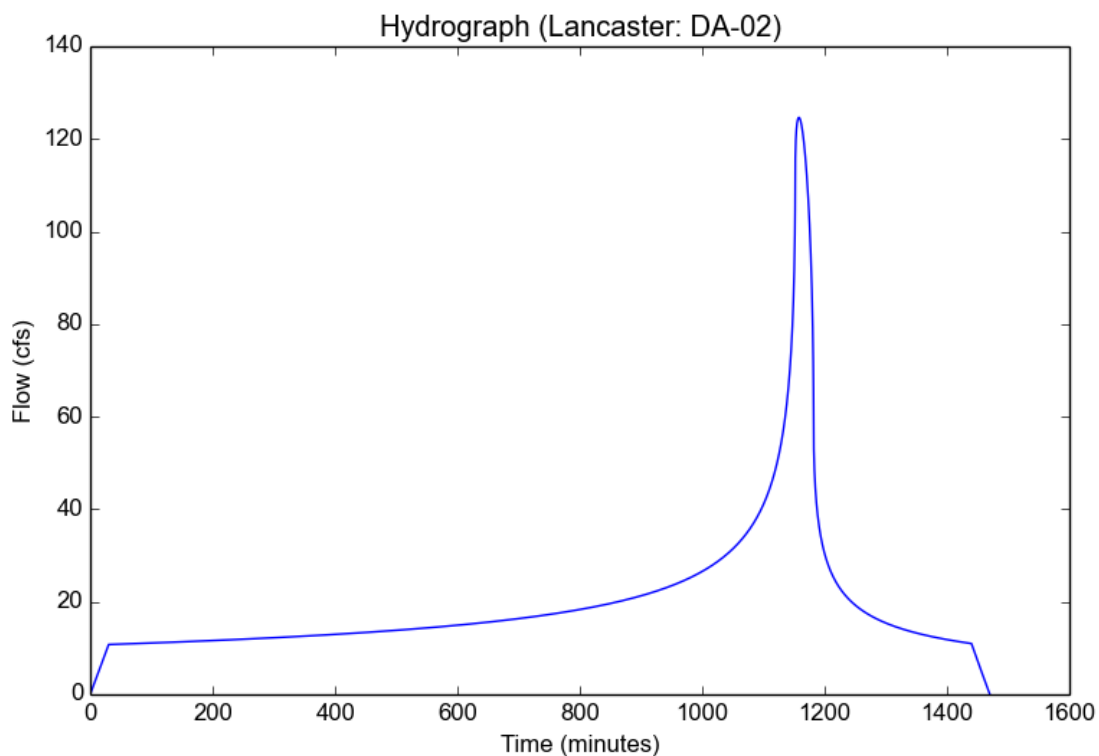
File location: C:/Users/Watearth - Will Hahn/Desktop/Lancaster Report P.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.823
Soil Type	120
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	2.4584
Peak Intensity (in/hr)	0.6319
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.7584
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	124.6417
Burned Peak Flow Rate (cfs)	124.6417
24-Hr Clear Runoff Volume (ac-ft)	40.0784
24-Hr Clear Runoff Volume (cu-ft)	1745816.9706



Peak Flow Hydrologic Analysis

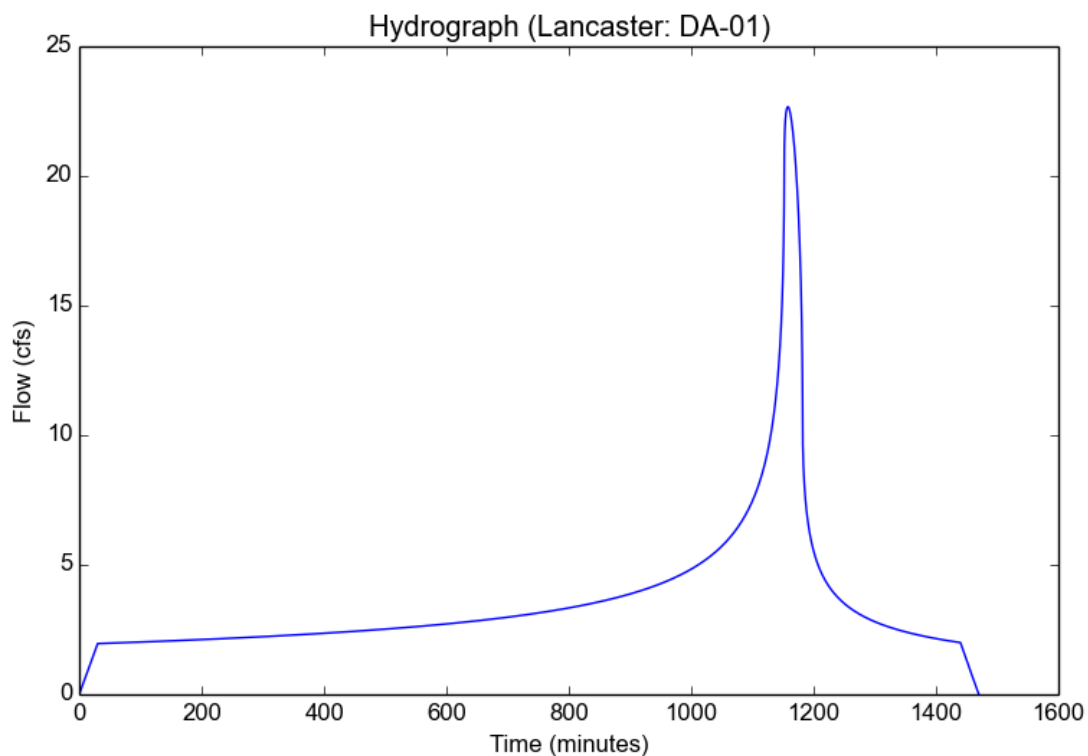
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	1.0
Soil Type	124
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.8
Peak Intensity (in/hr)	0.7197
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	22.6694
Burned Peak Flow Rate (cfs)	22.6694
24-Hr Clear Runoff Volume (ac-ft)	7.2893
24-Hr Clear Runoff Volume (cu-ft)	317523.6456



Peak Flow Hydrologic Analysis

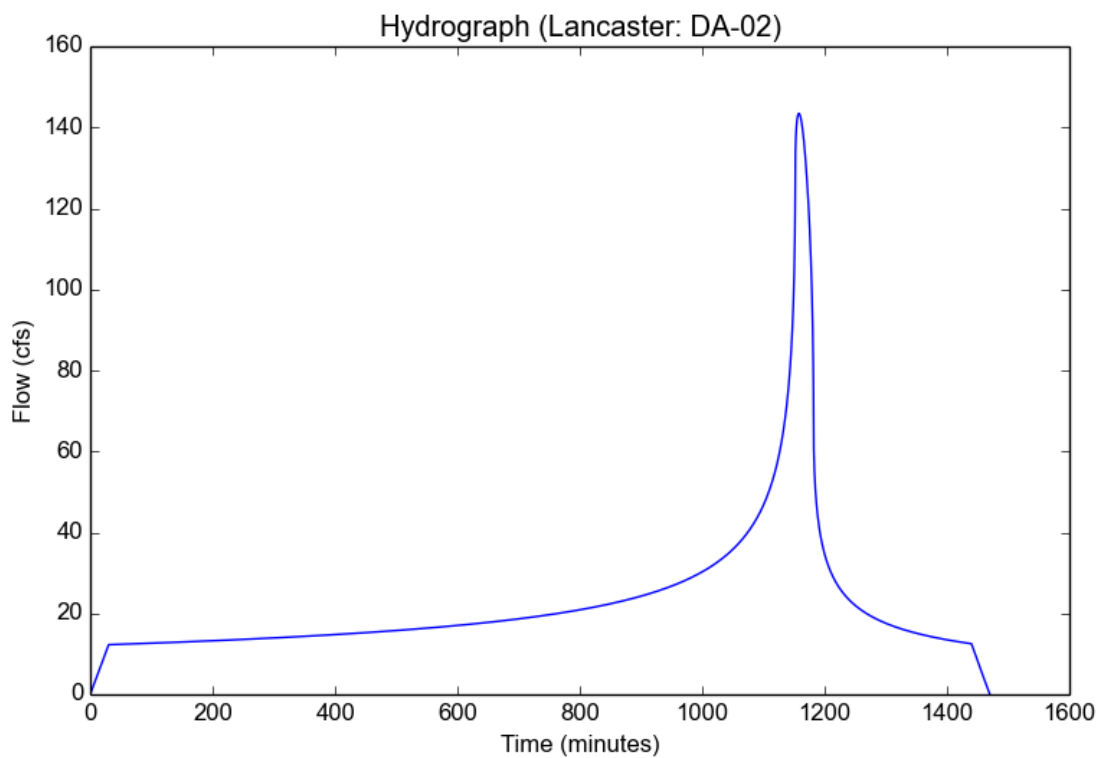
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.823
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.8
Peak Intensity (in/hr)	0.7197
Undeveloped Runoff Coefficient (Cu)	0.1447
Developed Runoff Coefficient (Cd)	0.7663
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	143.4403
Burned Peak Flow Rate (cfs)	143.4403
24-Hr Clear Runoff Volume (ac-ft)	45.6736
24-Hr Clear Runoff Volume (cu-ft)	1989542.73



Peak Flow Hydrologic Analysis

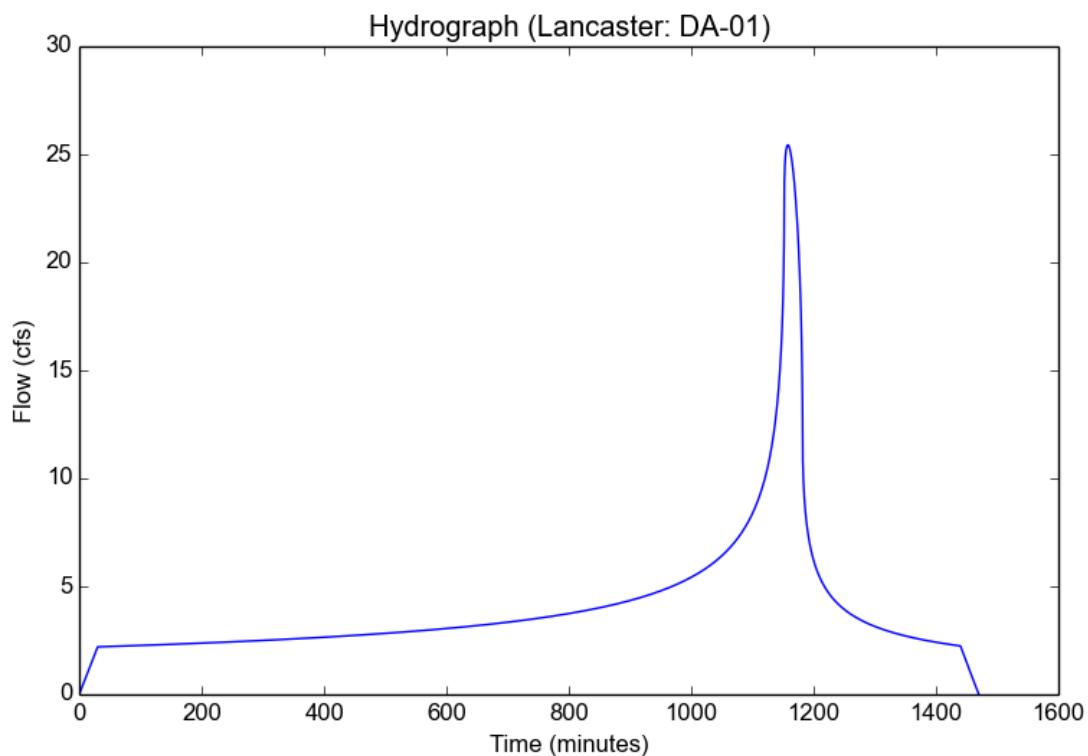
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	2.8
Percent Impervious	1.0
Soil Type	124
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	3.1416
Peak Intensity (in/hr)	0.8075
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	25.4351
Burned Peak Flow Rate (cfs)	25.4351
24-Hr Clear Runoff Volume (ac-ft)	8.1786
24-Hr Clear Runoff Volume (cu-ft)	356261.5303



Peak Flow Hydrologic Analysis

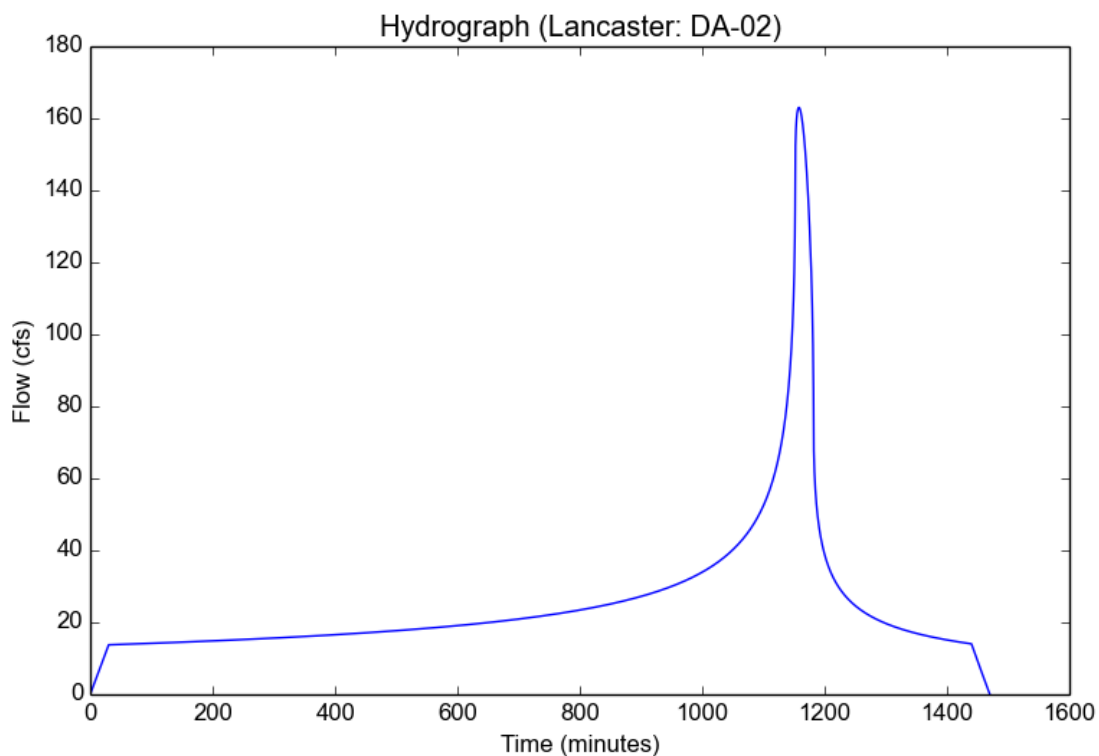
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	2.8
Percent Impervious	0.823
Soil Type	120
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	3.1416
Peak Intensity (in/hr)	0.8075
Undeveloped Runoff Coefficient (Cu)	0.2009
Developed Runoff Coefficient (Cd)	0.7763
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	163.0319
Burned Peak Flow Rate (cfs)	163.0319
24-Hr Clear Runoff Volume (ac-ft)	51.3033
24-Hr Clear Runoff Volume (cu-ft)	2234770.2464



Peak Flow Hydrologic Analysis

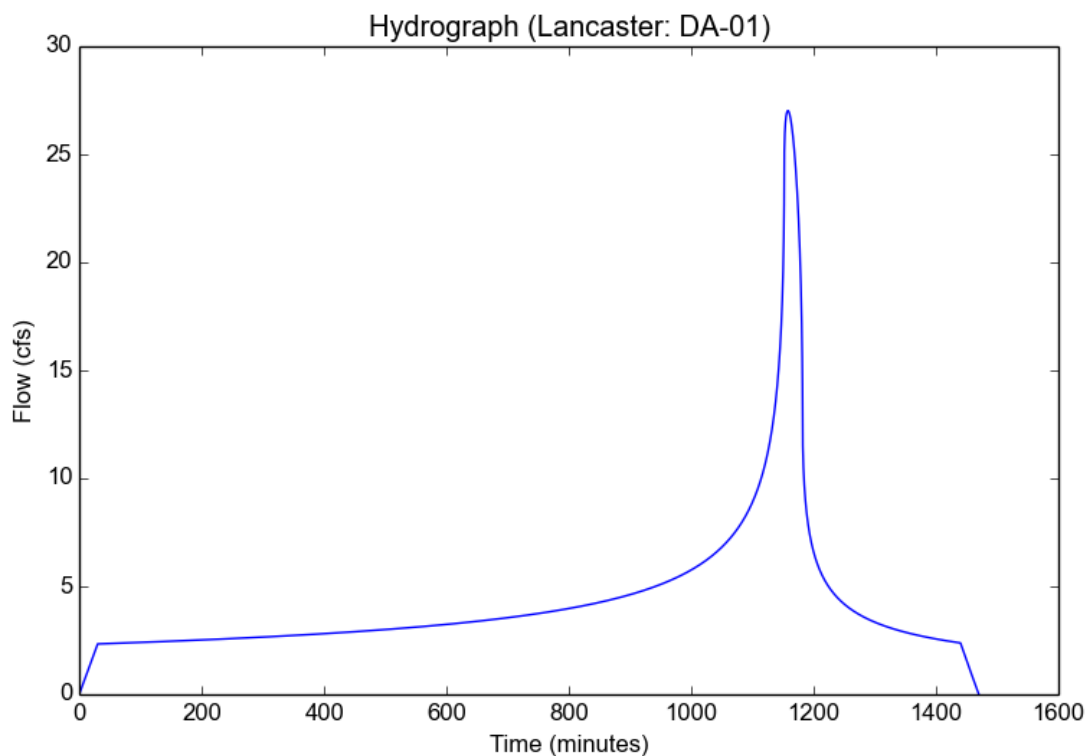
File location: C:/Users/Watearth - Will Hahn/Desktop/Lancaster Report P.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-01
Area (ac)	35.0
Flow Path Length (ft)	8700.0
Flow Path Slope (vft/hft)	0.0062
50-yr Rainfall Depth (in)	3.3376
Percent Impervious	1.0
Soil Type	124
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.3376
Peak Intensity (in/hr)	0.8578
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	27.022
Burned Peak Flow Rate (cfs)	27.022
24-Hr Clear Runoff Volume (ac-ft)	8.6889
24-Hr Clear Runoff Volume (cu-ft)	378488.1855



Peak Flow Hydrologic Analysis

File location: C:/Users/Watearth - Will Hahn/Desktop/Lancaster Report P.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Lancaster
Subarea ID	DA-02
Area (ac)	260.1
Flow Path Length (ft)	16000.0
Flow Path Slope (vft/hft)	0.0059
50-yr Rainfall Depth (in)	3.3376
Percent Impervious	0.823
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.3376
Peak Intensity (in/hr)	0.8578
Undeveloped Runoff Coefficient (Cu)	0.2332
Developed Runoff Coefficient (Cd)	0.782
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	174.4784
Burned Peak Flow Rate (cfs)	174.4784
24-Hr Clear Runoff Volume (ac-ft)	54.5436
24-Hr Clear Runoff Volume (cu-ft)	2375918.9994

