County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

BONITA ROAD SELF STORAGE PERMIT NO:
PDS2016-MUP-16-010 & PDS2016-ER-16-18-002

Bonita Road, Near Central Road
Bonita, CA 91902

ASSESSOR'S PARCEL NUMBER(S):
593-050-57

ENGINEER OF WORK:

Patric de Boer RCE 83583
REGISTRATION EXPIRES: 3-31-2019

PREPARED FOR:

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PDP SWQMP PREPARED BY:

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DATE OF SWQMP:
July 24th 2018

PLANS PREPARED BY:
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SWQMP APPROVED BY:

APPROVAL DATE:

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Table of Contents

Attachments

Acronyms

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
BMP DM	Best Management Practice Design Manual
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDCI	Private Development Construction Inspection Section
PDP	Priority Development Project
PDS	Planning and Development Services
PE	Professional Engineer
RPO	Resource Protection Ordinance
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan
WMAA	Watershed Management Area Analysis
WPO	Watershed Protection Ordinance
WQIP	Water Quality Improvement Plan

PDP SWQMP Preparer's Certification Page

Project Name: Bonita Road Self Storage
Permit Application Number: PDS2016-MUP-16-010 & PDS2016-ER-16-18-002

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the County of San Diego BMP Design Manual, which is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by County staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Patric de Boer EXP. 3/31/19
Engineer of Work's Signature, PE Number & Expiration Date

Patric de Boer
Print Name

Omega Engineering Consultants Inc.
Company

7/30/18
Date

Engineer's Seal:

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Submittal Record

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1	07/19/2016	Initial Submittal
2	01/25/2017	Resubmittal, Redlines Addressed
3	10/26/2017	Site revised SWMM Calcs added
4	07/24/2018	Resubmittal, Redlines Addressed.

Final Design

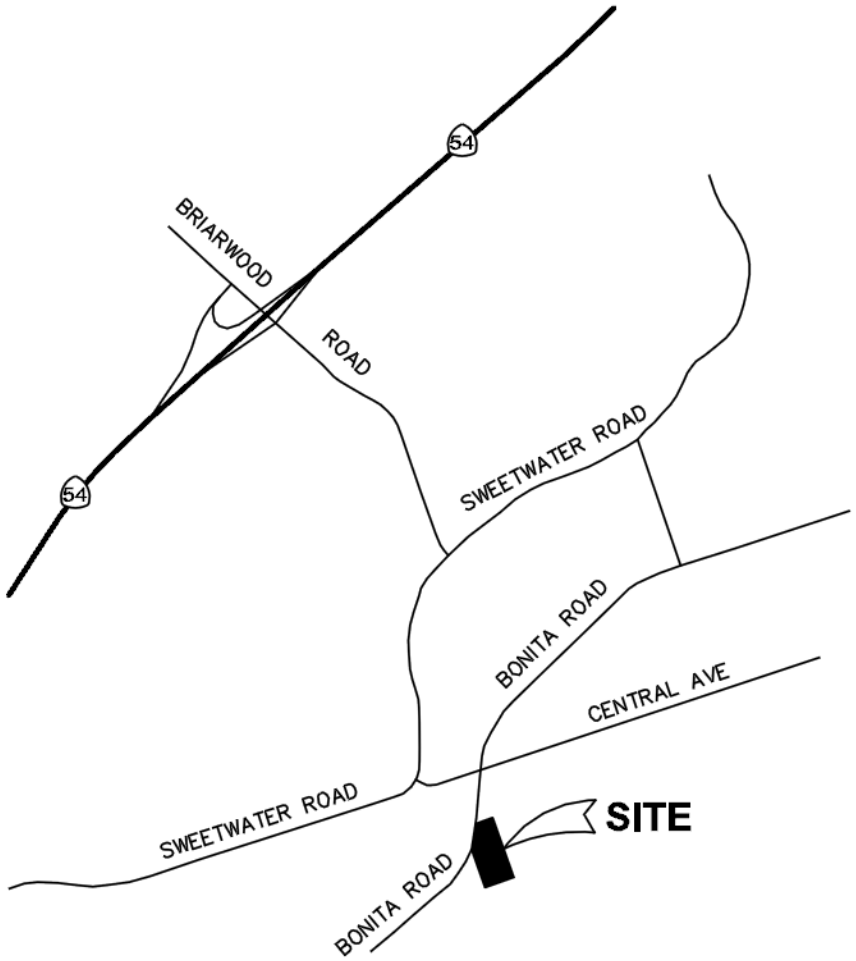
Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Plan Changes

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Project Vicinity Map

Project Name: Bonita Road Self Storage
Record ID: PDS2016-MUP-16-010 & PDS2016-ER-16-18-002



Step 1: Project type determination (Standard or Priority Development Project)

Is the project part of another Priority Development Project (PDP)? (☐ Yes ☒ No If so, a PDP SWQMP is required. Go to Step 2.			
The project is (select one): ☒ New Development ☐ Redevelopment[1]			
The total proposed newly created or replaced impervious area is: 126,536 ft^2			
The total existing (pre-project) impervious area is: 0 ft^2			
The total area disturbed by the project is: 158,359 ft^2			
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number must be obtained from the State Water Resources Control Board. WDID: _TBD__			
Is the project in any of the following categories, (a) through (f)?[2]			
Yes ☒	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces [3](collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

[1] Redevelopment is defined as: The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; new sidewalks construction; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

[2] Applicants should note that any development project that will create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site) is considered a new development.

[3] For solar energy farm projects, the area of the solar panels does not count toward the total impervious area of the site.

Project type determination (continued)

Yes ☐	No ☒	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☒	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See BMP Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

☐ No – the project is not a Priority Development Project (Standard Project).

☒ Yes – the project is a Priority Development Project (PDP).

Further guidance may be found in Chapter 1 and Table 1-2 of the BMP Design Manual.

The following is for **redevelopment PDPs only**:

The area of existing (pre-project) impervious area at the project site is: ft² (A)
The total proposed newly created or replaced impervious area is ft² (B)
Percent impervious surface created or replaced (B/A)*100: %
The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – **only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements**

OR

☐ greater than fifty percent (50%) – **the entire project site is considered a PDP and subject to stormwater requirements**

Step 1.1: Storm Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the BMP Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Standard Project SWQMP.**
	☒ PDP	Standard and PDP requirements apply, including PDP SWQMP. **Complete PDP SWQMP.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

Is the project exempt from PDP definitions based on either of the following: ☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Guidance on Green Infrastructure;	If so: Standard Project requirements apply, AND any additional requirements specific to the type of project. County concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.* **Complete Standard Project SWQMP**
☐ Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the County of San Diego Guidance on Green Infrastructure.	**Complete Green Streets PDP Exempt SWQMP.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:	

Step 2: Construction Storm Water BMP Checklist

Minimum Required Standard Construction Storm Water BMPs		
If you answer "Yes" to any of the questions below, your project is subject to Table 1 on the following page (Minimum Required Standard Construction Stormwater BMPs). As noted in Table 1, please select at least the minimum number of required BMPs, or as many as are feasible for your project. If no BMP is selected, an explanation must be given in the box provided. The following questions are intended to aid in determining construction BMP requirements for your project. **Note: All selected BMPs below must be included on the BMP plan incorporated into the construction plan sets.**		
1. Will there be soil disturbing activities that will result in exposed soil areas? (This includes minor grading and trenching.) **Reference Table 1 Items A, B, D, and E** Note: Soil disturbances NOT considered significant include, but are not limited to, change in use, mechanical/electrical/plumbing activities, signs, temporary trailers, interior remodeling, and minor tenant improvement.	☒Yes	☐No
2. Will there be asphalt paving, including patching? **Reference Table 1 Items D and F**	☒Yes	☐No
3. Will there be slurries from mortar mixing, coring, or concrete saw cutting? **Reference Table 1 Items D and F**	☒Yes	☐No
4. Will there be solid wastes from concrete demolition and removal, wall construction, or form work? **Reference Table 1 Items D and F**	☒Yes	☐No
5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours? **Reference Table 1 Items D and F**	☒Yes	☐No
6. Will there be dewatering operations? **Reference Table 1 Items C and D**	☐Yes	☒No
7. Will there be temporary on-site storage of construction materials, including mortar mix, raw landscaping and soil stabilization materials, treated lumber, rebar, and plated metal fencing materials? **Reference Table 1 Items E and F**	☒Yes	☐No
8. Will trash or solid waste product be generated from this project? **Reference Table 1 Item F**	☒Yes	☐No
9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?) **Reference Table 1 Item F**	☐Yes	☒No
10. Will Portable Sanitary Services ("Porta-potty") be used on the site? **Reference Table 1 Item F**	☒Yes	☐No

Table 1. Construction Storm Water BMP Checklist

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook[4] Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
A. Select Erosion Control Method for Disturbed Slopes (choose at least one for the appropriate season)			
Vegetation Stabilization Planting[5] (Summer)	SS-2, SS-4	☐	TBD
Hydraulic Stabilization Hydroseeding[2] (Summer)	SS-4	☒	
Bonded Fiber Matrix or Stabilized Fiber Matrix[6] (Winter)	SS-3	☒	
Physical Stabilization Erosion Control Blanket[3] (Winter)	SS-7	☐	
B. Select erosion control method for disturbed flat areas (slope < 5%) (choose at least one)			
County Standard Lot Perimeter Protection Detail	PDS 659[7], SC-2	☒	TBD
Will use erosion control measures from Item A on flat areas also	SS-3, 4, 7	☐	
County Standard Desilting Basin (must treat all site runoff)	PDS 660[8], SC-2	☐	
Mulch, straw, wood chips, soil application	SS-6, SS-8	☒	

4 State of California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual. March. Available online at: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm.

5 If Vegetation Stabilization (Planting or Hydroseeding) is proposed for erosion control it may be installed between May 1st and August 15th. Slope irrigation is in place and needs to be operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. The owner must implement a contingency physical BMP by August 15th if vegetation establishment does not occur by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.

6 All slopes over three feet must have established vegetative cover prior to final permit approval.

7 County of San Diego, Planning & Development Services. 2012. Standard Lot Perimeter Protection Design System. Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds659.pdf.

8 County of San Diego, Planning & Development Services. 2012. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds660.pdf.

Table 1. Construction Storm Water BMP Checklist (continued)

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
C. If runoff or dewatering operation is concentrated, velocity must be controlled using an energy dissipater			
Energy Dissipater Outlet Protection[9]	SS-10	☐	N/A
D. Select sediment control method for all disturbed areas (choose at least one)			
Silt Fence	SC-1	☒	TBD
Fiber Rolls (Straw Wattles)	SC-5	☐	
Gravel & Sand Bags	SC-6 & 8	☒	
Dewatering Filtration	NS-2	☐	
Storm Drain Inlet Protection	SC-10	☐	
Engineered Desilting Basin (sized for 10-year flow)	SC-2	☐	
E. Select method for preventing offsite tracking of sediment (choose at least one)			
Stabilized Construction Entrance	TC-1	☒	TBD
Construction Road Stabilization	TC-2	☐	
Entrance/Exit Tire Wash	TC-3	☐	
Entrance/Exit Inspection & Cleaning Facility	TC-1	☐	
Street Sweeping and Vacuuming	SC-7	☒	
F. Select the general site management BMPs			
F.1 Materials Management			
Material Delivery & Storage	WM-1	☒	TBD
Spill Prevention and Control	WM-4	☒	
F.2 Waste Management[10]			
Waste Management Concrete Waste Management	WM-8	☒	TBD
Solid Waste Management	WM-5	☒	
Sanitary Waste Management	WM-9	☒	
Hazardous Waste Management	WM-6	☐	

Note: The Construction General Permit (Order No. 2009-0009-DWQ) also requires all projects not subject to the BMP Design Manual to comply with runoff reduction requirements through the implementation of post-construction BMPs as described in Section XIII of the order.

[9] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater is also acceptable for velocity reduction.

[10] Not all projects will have every waste identified. The applicant is responsible for identifying wastes that will be onsite and applying the appropriate BMP. For example, if concrete will be used, BMP WM-8 must be selected.

Step 3: County of San Diego PDP SWQMP Site Information Checklist

Step 3.1: Description of Existing Site Condition

Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Hydraulic Unit: Sweetwater, Hydraulic Area: Lower Sweetwater, Sub-area: La Nacion 909.12

Current Status of the Site (select all that apply):

- ☐ Existing development
- ☐ Previously graded but not built out
- ☐ Demolition completed without new construction
- ☐ Agricultural or other non-impervious use
- ☒ Vacant, undeveloped/natural

Description / Additional Information:
The site is an undeveloped lightly vegetated grassland that slopes less than 1% for the majority of the property. At the north end of the property there is a vegetated channel.

Existing Land Cover Includes (select all that apply and provide each area on site):

- ☒ Vegetative Cover 3.64 Acres (158,359 Square Feet)
- ☐ Non-Vegetated Pervious Areas _____ Acres (_____ Square Feet)
- ☐ Impervious Areas _____ Acres (_____ Square Feet)

Description / Additional Information:
The site is grassland with dense vegetation in the channel and areas where water concentrates on site.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

- ☐ NRCS Type A
- ☐ NRCS Type B
- ☒ NRCS Type C
- ☐ NRCS Type D

Approximate Depth to Groundwater (GW) (or N/A if no infiltration is used): TBD

- ☐ GW Depth < 5 feet
- ☐ 5 feet < GW Depth < 10 feet
- ☐ 10 feet < GW Depth < 20 feet
- ☐ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):

- ☒ Watercourses
- ☐ Seeps
- ☐ Springs
- ☒ Wetlands
- ☐ None
- ☐ Other

Description / Additional Information:
There is an existing vegetated drainage channel at the north end of the property. Exact designation TBD. No alteration is proposed for this channel.

Step 3.2: Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

(1) Whether existing drainage conveyance is natural or urban;
(2) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:

1. The site drainage is urban surrounding the vacant pad which is vegetated.
2. Offsite runoff is conveyed through the site. Surrounding slopes, part of Bonita Road, and the fire station to the west all contribute run-on to the site. These areas are quantified in the attached Hydrology report. There is also flow from upstream areas that flows through the channel on-site. Because the channel was considered the point of compliance for the proposed development the upstream area was not quantified.
3. The site is currently an unimproved vacant field. The existing channel is vegetated but both upstream and downstream has hardened concrete sections.
4. The site and all offsite run-on contribute a total of 9.85 CFS to the onsite channel. Pre-project drainage areas and flow calculations are in the attached Hydrology report.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:
The project proposes a self-storage facility with associated hardscape.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
There will be three separate buildings with associated drive aisles and parking area.

List/describe proposed pervious features of the project (e.g., landscape areas):
Any disturbed slopes surrounding the site will remain pervious. The project proposes a vegetated pervious channel along the southwest boundary. The site also proposes 2 Biofiltration basins.

Does the project include grading and changes to site topography?

☒Yes

☐No

Description / Additional Information:
The project proposes grading and storm drain to transport the runoff to a Biofiltration basin before discharging to the existing channel to the north.

Insert acreage or square feet for the different land cover types in the table below:

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation	3.64 ac	0.74 ac	-80%
Pervious (non-vegetated)	0	0	0%
Impervious	0	2.90 ac	+80

Step 3.4: Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒Yes
☐No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:
The site will be generally raised. This will allow installation of a site drainage network and stormwater detention and treatment facilities. There will be ribbon gutter flow between the buildings where it will be captured into the private storm drain system. All proposed impervious areas will flow to a biofiltration basin.

The 100 year storm flow will not be exceeded due to storage being provided in the large bio-retention basin. See the attached hydrology report for particulars of design flows, storm drain sizes, and 100 year storm storage and attenuation.

Step 3.5: Potential Pollutant Source Areas

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply). Select "Other" if the project is a phased development and provide a description:

- ☒ On-site storm drain inlets
- ☐ Interior floor drains and elevator shaft sump pumps
- ☐ Interior parking garages
- ☐ Need for future indoor & structural pest control
- ☐ Landscape/Outdoor Pesticide Use
- ☐ Pools, spas, ponds, decorative fountains, and other water features
- ☐ Food service
- ☒ Refuse areas
- ☐ Industrial processes
- ☐ Outdoor storage of equipment or materials
- ☐ Vehicle and Equipment Cleaning
- ☐ Vehicle/Equipment Repair and Maintenance
- ☐ Fuel Dispensing Areas
- ☐ Loading Docks
- ☒ Fire Sprinkler Test Water
- ☐ Miscellaneous Drain or Wash Water
- ☒ Plazas, sidewalks, and parking lots
- ☐ Other (provide description)

Description / Additional Information:

Step 3.6: Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):
The project discharges to an urban drainage channel that then flows about a 1000 feet to the Lower Sweetwater River. It thence flows to the San Diego Bay.

List any 303(d) impaired water bodies[11] within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
Lower Sweetwater River	Enterococcus, Fecal Coliform, Phosphorus, Selenium, Total Dissolved Solids, N, Toxicity	TMDL required
San Diego Bay	*PCBs*	Est. TMDL completion 2019

Identification of Project Site Pollutants*

*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated).

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	☒	☐
Nutrients	☐	☒	☐
Heavy Metals	☐	☒	☐
Organic Compounds	☐	☒	☒
Trash & Debris	☐	☒	☐
Oxygen Demanding Substances	☐	☒	☒
Oil & Grease	☐	☒	☐

[11] The current list of Section 303(d) impaired water bodies can be found at http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired

Bacteria & Viruses	☐	☒	☒
Pesticides	☐	☒	☐

Step 3.7: Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☒Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.

☐No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA[12] for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Project will use the biofiltration basin for storage and flow attenuation for hydromodification purposes. SWMM calculations have been included in the attachments of this report.

[12] The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]. It is available online at the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248

Step 3.7.1: Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Projects must satisfy critical coarse sediment yield area (CCSYA) requirements by characterizing the project as one of the scenario-types presented below and satisfying associated criteria. Projects must appropriately satisfy all requirements for identification, avoidance, and bypass, OR may alternatively elect to demonstrate no net impact.

☐ **Scenario 1**: Project is subject to and in compliance with RPO requirements *(without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3) that result in impacts to more than 15% of the project-scale CCSYAs)*.

- ☐ Identify: Project has identified both onsite and upstream CCSYAs as areas that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☐ Avoid: Project has avoided onsite CCSYAs per existing RPO steep slope encroachment criteria. AND,
- ☐ Bypass: Project has demonstrated that both onsite and upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 1 criteria above and must alternatively demonstrate no net impact to the receiving water.

☒ **Scenario 2**: Project is entirely exempt/not subject to RPO requirements without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3).

- ☒ Identify: Project has identified upstream CCSYAs that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☒ Avoid: Project is not required to avoid onsite CCSYAs as none were identified in the previous step. AND,
- ☒ Bypass: Project has demonstrated that upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 2 criteria above and must alternatively demonstrate no net impact to the receiving water. *(Skip to next row).*

☐ **Scenario 3**: Project utilizes exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3) and impacts more than 15% of the project-scale CCSYAs.

- ☐ No Net Impact: Project is not eligible for traditional methods of identification, avoidance, and bypass. Project must demonstrate no net impact to the receiving water.

Critical Coarse Sediment Yield Areas Continued
Demonstrate No Net Impact
If the project elects to satisfy CCSYA criteria through demonstration of no net impact to the receiving water. Applicants must identify the methods utilized from the list below and provide supporting documentation in Attachment 2c of the SWQMP. Check all that are applicable. ☐ N/A, the project appropriately identifies, avoids, and bypasses CCSYAs. ☐ Project has performed additional analysis to demonstrate that impacts to CCSYAs satisfy the no net impact standard of Ep/Sp≤1.1. ☐ Project has provided alternate mapping of CCSYAs. ☐ Project has implemented additional onsite hydromodification flow control measures. ☐ Project has implemented an offsite stream rehabilitation project to offset impacts. ☐ Project has implemented other applicant-proposed mitigation measures.

Step 3.7.2: Flow Control for Post-Project Runoff*

*This Section only required if hydromodification management requirements apply
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. The project has one point of compliance for existing and proposed. The Point of Compliance is the existing channel at the north end of the site. This is POC-1.
Has a geomorphic assessment been performed for the receiving channel(s)? ☒ No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐ Yes, the result is the low flow threshold is 0.1Q2 ☐ Yes, the result is the low flow threshold is 0.3Q2 ☐ Yes, the result is the low flow threshold is 0.5Q2 *If a geomorphic assessment has been performed, provide title, date, and preparer:* *Discussion / Additional Information: (optional)*

Step 3.8: Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.

The depth to groundwater is listed as greater than 80" from the NRCS websoil survey. Final geotechnical investigation to come in future submittals.

Step 4: Source Control BMP Checklist

Source Control BMPs			
All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the County BMP Design Manual for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.1 not implemented: Storm Drain Stenciling will be used to deter illicit discharges into onsite storm drains. The employees of the facility will be trained to dispose of discharges properly and to stop any customer from illicitly discharging.			
4.2.2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.2 not implemented: The onsite storm drains will be marked “No Dumping Drains to Ocean” or similar.			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.3 not implemented: No outdoor storage areas proposed.			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.4 not implemented: No outdoor work areas proposed.			

Source Control Requirement	Applied?		
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.5 not implemented: The trash area will be enclosed and protected from rainfall, run-on, runoff, and wind dispersal.			
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☒ A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☐ B. Interior floor drains and elevator shaft sump pumps	☐Yes	☐No	☒N/A
☐ C. Interior parking garages	☐Yes	☐No	☒N/A
☐ D. Need for future indoor & structural pest control	☐Yes	☐No	☒N/A
☐ E. Landscape/outdoor pesticide use	☐Yes	☐No	☒N/A
☐ F. Pools, spas, ponds, fountains, and other water features	☐Yes	☐No	☒N/A
☐ G. Food service	☐Yes	☐No	☒N/A
☒ H. Refuse areas	☒Yes	☐No	☐N/A
☐ I. Industrial processes	☐Yes	☐No	☒N/A
☐ J. Outdoor storage of equipment or materials	☐Yes	☐No	☒N/A
☐ K. Vehicle and equipment cleaning	☐Yes	☐No	☒N/A
☐ L. Vehicle/equipment repair and maintenance	☐Yes	☐No	☒N/A
☐ M. Fuel dispensing areas	☐Yes	☐No	☒N/A
☐ N. Loading docks	☐Yes	☐No	☒N/A
☒ O. Fire sprinkler test water	☒Yes	☐No	☐N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☐No	☒N/A
☒ Q. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above. A. On-site storm drains will be marked “No Dumping” or similar. H. Refuse areas will be protected from run-on and wind dispersal. O. Fire Sprinkler test water will be discharged to the sanitary sewer Q. The drive aisles and parking area will be swept for trash and debris by the owner. All other source control BMPs are not applied because they are not applicable to the proposed site.			

Note: Show all source control measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 5: Site Design BMP Checklist

Site Design BMPs
All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the County BMP Design Manual for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.1 not implemented: The project does not propose improvements to the vegetated channel in the northern section of the property.			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.2 not implemented: The project does not propose improvements to the vegetated channel in the northern section of the property.			
4.3.3 Minimize Impervious Area	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.3 not implemented: The site is designed to maximize the functionality of the self storage. All impervious area serves a purpose related to the intent of the project.			
4.3.4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.4 not implemented: All areas that are not to be built on or paved will avoid soil compaction.			
4.3.5 Impervious Area Dispersion	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.5 not implemented: Impervious Area dispersion not implemented as the site is mostly pervious. Permeable pavements are not feasible, as most paved areas are fire access lanes that require stronger pavement sections. Biofiltration area has been sized assuming no dispersion.			

Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☐Yes	☐No	☒N/A
Discussion / justification if 4.3.6 not implemented: The site does not collect runoff in pervious pavers or in small catchments the site is mostly impervious and permeable pavements area not feasible for this site.			
4.3.7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.7 not implemented: Any landscaped area will use native and drought tolerant species.			
4.3.8 Harvesting and Using Precipitation	☐Yes	☐No	☒N/A
Discussion / justification if 4.3.8 not implemented: A preliminary feasibility calculation was conducted using the county of San Diego Automated Storm water Worksheets. There is too little demand for irrigation and toilet use for Harvest and Reuse to be feasible.			

Note: Show all site design measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 6: PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the County at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the County must confirm the maintenance (see Section 7 of the BMP Design Manual).

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [Step 6.2] as many times as needed to provide summary information for each individual structural BMP).

Step 6.1: Description of structural BMP strategy

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. At the end of this discussion provide a summary of all the structural BMPs within the project including the type and number.

The County of San Diego BMP design manual is used to ensure compliance with the storm water regulations of the region.

The steps of the BMP design manual were followed to select and design the pollutant control BMPs.

The DMAs were delineated based on the proposed site grading. This results in 2 separate drainage management areas. Only one of these (DMA-1) requires storm water treatment facilities. The other area, DMA-2, is a proposed self-mitigating area that is entirely pervious. The design capture volume is calculated using the method in Appendix B of the BMP design manual and using the County of San Diego Automated Storm water Pollutant Control Worksheets. Following this, the hierarchy of structural BMPs are followed

(Continue on following page as necessary.)

Description of structural BMP strategy continued
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)

(Continued from previous page)

The first consideration was the feasibility of Harvest and Reuse. Using the calculated DCV for the DMAs and the County of San Diego's Automated Stormwater Pollutant Control Worksheets. Harvest and Use is considered infeasible. The demand for irrigation is not enough and the demand for toilet use is also too low and there is no guarantee of visitor use for toilet flushing. The demand is calculated to be less than 1% of the DCV. Therefore Harvest and Reuse is considered infeasible.

The second consideration is the feasibility of infiltration. Based on the county hydrologic soil group map, the site is comprised of C type soil. For discretionary submittals, the native soil is assumed to be suitable for partial infiltration at a rate of 0.1 in/hr (per Table G.1-4 BMP Design Manual) .

When the geotechnical report is available, the infiltration feasibility of the site will be revisited, but for the conceptual, design partial infiltration is assumed to be feasible. Biofiltration with partial retention was chosen to treat stormwater.

The San Diego County Automated pollutant control worksheets are used to size the biofiltration basin. Following this, SWMM modeling was conducted to determine the required storage and outlet control necessary to meet hydromodification requirements. The SWMM model follows appendix G and the inputs and output can be found in Attachment 2.

The project proposes 1 biofiltration basin (partial retention).The facility will be constructed with flow control and storage for hydromodification compliance. It will have a low flow orifice to attenuate to the existing 100 year flow. The 100 year flow storage is calculated per the Hydrology and Hydraulics report contained in attachment 6 of this SWQMP. The facilities will also feature bypass structures for emergency overflow.

It is the opinion of Omega Engineering Consultants that the current site design will treat and store for compliance with all storm water requirements.

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. BMP-1	
Construction Plan Sheet No. TBD	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☒ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☒ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Andrew J. Kann, P.E. 4340 Viewridge Ave., Suite B San Diego, CA 92123 (858)-634-8620
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	1
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

Step 6.3: Offsite Alternative Compliance Participation Form

PDP INFORMATION	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐ Yes ☐ No	Will your ACP project be completed prior to the completion of the PDP? ☐ Yes ☐ No
Does your ACP account for all Deficits generated by the PDP? ☐ Yes ☐ No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits)

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.3-1 (Required) -Worksheet B.1-1 (Required) -Worksheet B.4-1 (if applicable) -Worksheet B.4-2 (if applicable) -Worksheet B.5-1 (if applicable) -Worksheet B.5-2 (if applicable) -Worksheet B.5-3 (if applicable) -Worksheet B.6-1 (if applicable) -Summary Worksheet (optional)	☒ Included
Attachment 1b	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☒ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1c	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☒ Included
Attachment 1d	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☐ Included

Automated Worksheet B.3-1: Project-Scale BMP Feasibility Analysis (V1.3)

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	5,319	cubic-feet
	1	Proposed Development Type	Industrial	unitless
	2	Number of Residents or Employees at Proposed Development	3	#
	3	Total Planted Area within Development	19,377	sq-ft
	4	Water Use Category for Proposed Planted Areas	Moderate	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	Yes	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	No	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	No	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.10	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	3	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	196.52	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	87	cubic-feet
	13	Total Anticipated Use Over 36 Hours	91	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.02	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	No	yes/no
Result	18	Feasibility Category	5	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.

B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.

C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.

D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.

E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.

F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	DMA-1										unitless
	1	Basin Drains to the Following BMP Type	Biofiltration										unitless
	2	85th Percentile 24-hr Storm Depth	0.54										inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.100										in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	126,536										sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	19,377										sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	145,913	0	0	0	0	0	0	0	0	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	32	Initial Design Capture Volume	5,319	0	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.81	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	5,319	0	0	0	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	42	Final Effective Tributary Area	118,190	0	0	0	0	0	0	0	0	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	5,319	0	0	0	0	0	0	0	0	0	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

Automated Worksheet B.5-1: Sizing Lined or Unlined Biofiltration BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	DMA-1	-	-	-	-	-	-	-	-	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.100	-	-	-	-	-	-	-	-	-	in/hr
	2	Effective Tributary Area	118,190	-	-	-	-	-	-	-	-	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	-	-	-	-	-	-	-	-	-	ratio
	4	Design Capture Volume Tributary to BMP	5,319	-	-	-	-	-	-	-	-	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Unlined										unitless
	6	Provided Biofiltration BMP Surface Area	4,400										sq-ft
	7	Provided Surface Ponding Depth	12										inches
	8	Provided Soil Media Thickness	18										inches
	9	Provided Depth of Gravel Above Underdrain Invert	27										inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	1.00										inches
	11	Provided Depth of Gravel Below the Underdrain	3										inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	220	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	18	0	0	0	0	0	0	0	0	0	hours
	17	Volume Retained by BMP	990	0	0	0	0	0	0	0	0	0	cubic-feet
	18	Fraction of DCV Retained	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	3,776	0	0	0	0	0	0	0	0	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.0570	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.56	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	0.56	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	3.36	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	26.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	29	Drawdown Time for Surface Ponding	18	0	0	0	0	0	0	0	0	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	40	0	0	0	0	0	0	0	0	0	hours
	31	Total Depth Biofiltered	29.76	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	5,664	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	5,664	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	2,832	0	0	0	0	0	0	0	0	0	cubic-feet
	35	Option 2 - Provided Storage Volume	2,832	0	0	0	0	0	0	0	0	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	-	-	-	-	-	-	-	-	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	**Deficit of Effectively Treated Stormwater**	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined or Unlined Biofiltration BMPs (BF-1, PR-1) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
General Info	0	Drainage Basin ID or Name	DMA-1	-	-	-	-	-	-	-	-	-	unitless
	1	85th Percentile Storm Depth	0.54	-	-	-	-	-	-	-	-	-	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.100	-	-	-	-	-	-	-	-	-	in/hr
	3	Total Tributary Area	145,913	-	-	-	-	-	-	-	-	-	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	6,566	-	-	-	-	-	-	-	-	-	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.81	-	-	-	-	-	-	-	-	-	unitless
	6	Initial Design Capture Volume	5,319	-	-	-	-	-	-	-	-	-	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	-	-	-	-	-	-	-	-	-	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	-	-	-	-	-	-	-	-	-	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	118,190	-	-	-	-	-	-	-	-	-	square feet
	10	Final Design Capture Volume Tributary to BMP	5,319	-	-	-	-	-	-	-	-	-	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	-	-	-	-	-	-	-	-	-	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	1,543	-	-	-	-	-	-	-	-	-	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.29	-	-	-	-	-	-	-	-	-	fraction
	14	Percent of Average Annual Runoff Retention Provided	36.3%	-	-	-	-	-	-	-	-	-	%
	15	Percent of Average Annual Runoff Retention Required	22.2%	-	-	-	-	-	-	-	-	-	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	-	-	-	-	-	-	-	-	-	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	-	-	-	-	-	-	-	-	-	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	-	-	-	-	-	-	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summairzed in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

-Congratulations, all specified drainage basins and BMPs are in compliance with stormwater pollutant control requirements. Include 11x17 color prints of this summary sheet and supporting worksheet calculations as part of the SWQMP submittal package.

False

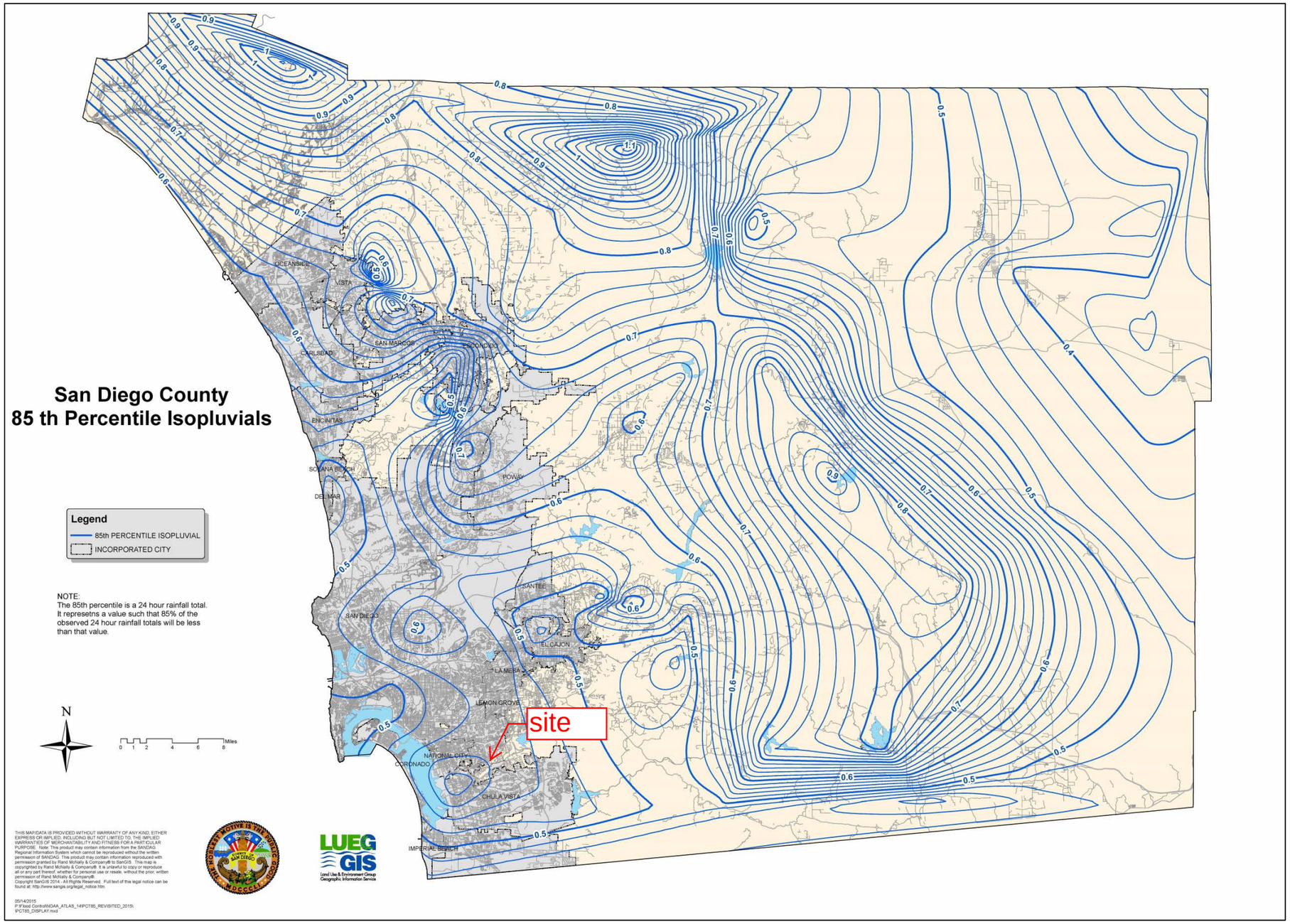


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

Categorization of Infiltration Feasibility Condition	Form I-8

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis:

For preliminary analysis the NRCS web soil survey is used. The soil type is reported to be type C. The infiltration rate of the most restrictive layer is reported by NRCS to be 0 to 0.10 inches per hour. Further Geotechnical investigation will come in later reviews. For this submittal the infiltration rate is taken to be 0.10 in/hr.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	TBD	TBD

Provide basis:

Final geotechnical recommendations are pending.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form I-8 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	TBD	TBD
Provide basis: Final geotechnical recommendations are pending. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	TBD	TBD
Provide basis: Final geotechnical recommendations are pending. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result *	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2	No Final TBD	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form I-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	

Provide basis:

For preliminary analysis the NRCS web soil survey is used. The soil type is reported to be type C. The infiltration rate of the most restrictive layer is reported by NRCS to be 0 to 0.10 inches per hour. Further Geotechnical investigation will come in later reviews. For this submittal the infiltration rate is taken to be 0.10 in/hr.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	TBD	TBD

Provide basis:

Final geotechnical recommendations are pending.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-8 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	TBD	TBD
Provide basis: Final geotechnical recommendations are pending. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	TBD	TBD
Provide basis: Final geotechnical recommendations are pending. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**	Partial Infiltration FINAL TBD	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography and impervious areas
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed demolition
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☒ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
☒ Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

ATTACHMENT 2

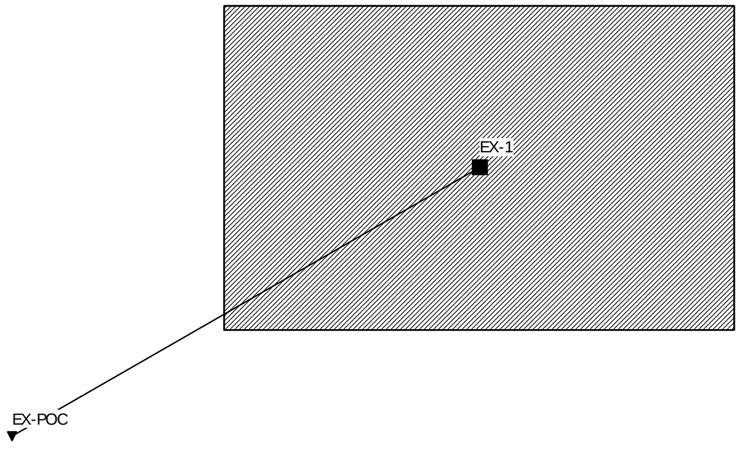
BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

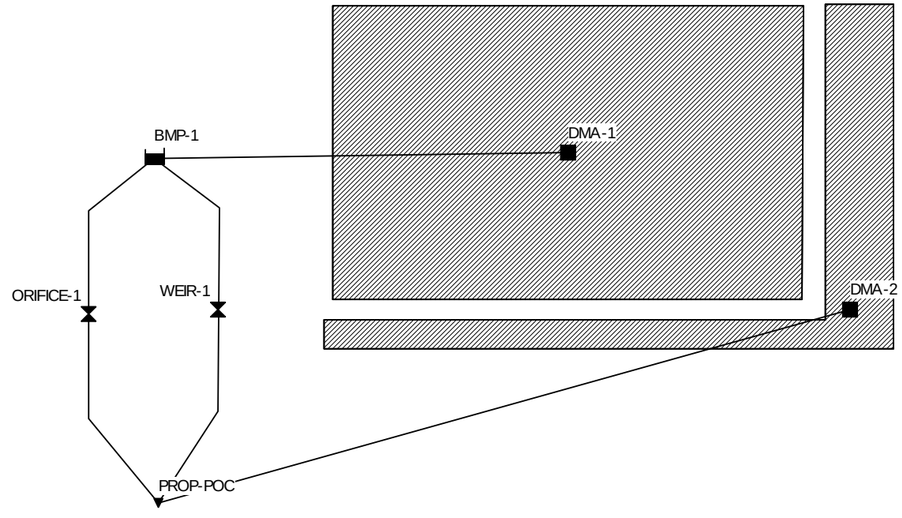
This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☒ Included ☐ Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☒ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the BMP Design Manual.	☒ Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped by Regional or Jurisdictional approaches outlined in Appendix H.1 AND, ☒ Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment per approaches outlined in Appendix H.2 and H.3. OR, ☒ Demonstration that project does not generate a net impact on the receiving water per approaches outlined in Appendix H.4.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☒ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☒ Not required because BMPs will drain in less than 96 hours


EX-1
EX-1
EX-POC


BMP-1
DMA-1
BMP-1
DMA-1
ORIFICE-1
WEIR-1
DMA-2
PROP-POC

```
[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option              Value
FLOW_UNITS            CFS
INFILTRATION          GREEN_AMPT
FLOW_ROUTING          KINWAVE
LINK_OFFSETS          DEPTH
MIN_SLOPE             0
ALLOW_PONDING         NO
SKIP_STEADY_STATE     NO

START_DATE            10/03/1970
START_TIME            05:00:00
REPORT_START_DATE     10/03/1970
REPORT_START_TIME     05:00:00
END_DATE              05/25/2008
END_TIME              22:00:00
SWEEP_START           01/01
SWEEP_END             12/31
DRY_DAYS              0
REPORT_STEP           01:00:00
WET_STEP              00:15:00
DRY_STEP              04:00:00
ROUTING_STEP          0:01:00

INERTIAL_DAMPING      PARTIAL
NORMAL_FLOW_LIMITED   BOTH
FORCE_MAIN_EQUATION   H-W
VARIABLE_STEP         0.75
LENGTHENING_STEP      0
MIN_SURFAREA          12.557
MAX_TRIALS            8
HEAD_TOLERANCE        0.005
SYS_FLOW_TOL          5
LAT_FLOW_TOL          5
MINIMUM_STEP          0.5
THREADS               1

[EVAPORATION]
;;Data Source        Parameters
;;--------------     ----------------
MONTHLY               .07     .1      .13     .17     .19     .22     .3      .27     .21     .14     .08     .05
DRY_ONLY              NO

[RAINGAGES]
;;Name                Format          Interval        SCF             Source
;;--------------      ---------       ------  ------  ----------
BONITA_GAGE           INTENSITY       1:00            1.0             TIMESERIES      BONITA_GAGE

[SUBCATCHMENTS]
;;Name                Rain Gage               Outlet                  Area            %Imperv         Width           %Slope          CurbLen         SnowPack
;;--------------      ---------------         ----------------        --------        --------        --------        --------        --------        ----------------
EX-1                  BONITA_GAGE             EX-POC                  3.64            0.0             300             2.5             0
DMA-1                 BONITA_GAGE             BMP-1                   3.35            86.7            200             0.5             0
DMA-2                 BONITA_GAGE             PROP-POC                0.29            0.0             36              2.0             0

[SUBAREAS]
;;Subcatchment        N-Imperv        N-Perv          S-Imperv        S-Perv          PctZero         RouteTo         PctRouted
;;--------------      ----------      ----------      ----------      ----------      ----------      ----------      ----------
EX-1                  0.012           0.04            0.05            0.10            25              OUTLET
DMA-1                 0.012           0.08            0.05            0.10            25              PERVIOUS        100
```

```
DMA-2                   0.012          0.08           0.05           0.10            25              OUTLET

[INFILTRATION]
;;Subcatchment          Suction        Ksat           IMD
;;--------------        ----------     ----------     ----------
EX-1                    6.0            0.1            0.32
DMA-1                   6.0            0.1            0.32
DMA-2                   6.0            0.1            0.32

[OUTFALLS]
;;Name                  Elevation      Type           Stage Data             Gated          Route To
;;--------------        ----------     ----------     ----------------       --------       ----------------
EX-POC                  0              FREE                                  NO
PROP-POC                0              FREE                                  NO

[STORAGE]
;;Name                  Elev.          MaxDepth       InitDepth      Shape           Curve Name/Params                N/A            Fevap          Psi
Ksat            IMD
;;--------------        --------       ----------     -----------    ----------      ----------------------------     --------       --------
--------        --------
BMP-1                   0              7.0            0              TABULAR         BMP-1                            0              0              6.0
0.10            0.32

[ORIFICES]
;;Name                  From Node              To Node                Type           Offset         Qcoeff         Gated          CloseTime
;;--------------        ----------------       ----------------       ------------   ----------     ----------     --------       ----------
ORIFICE-1               BMP-1                  PROP-POC               SIDE           0.25           0.65           NO             0

[WEIRS]
;;Name                  From Node              To Node                Type           CrestHt        Qcoeff         Gated          EndCon         EndCoeff
Surcharge       RoadWidth       RoadSurf
;;--------------        ----------------       ----------------       ------------   ----------     ----------     --------       --------       ----------
----------      ----------      ----------
WEIR-1                  BMP-1                  PROP-POC               TRANSVERSE     5.0            3.33           NO             0              0
YES

[XSECTIONS]
;;Link                  Shape          Geom1                  Geom2          Geom3          Geom4          Barrels        Culvert
;;--------------        ------------   ----------------       ----------     ----------     ----------     ----------     ----------
ORIFICE-1               CIRCULAR       0.083                  0              0              0
WEIR-1                  RECT_OPEN      0.5                    3              0.5            0.5

[CURVES]
;;Name                  Type           X-Value        Y-Value
;;--------------        ----------     ----------     ----------
BMP-1                   Storage        0.0            4397
BMP-1                                  0.01           1760
BMP-1                                  2.5            1760
BMP-1                                  2.51           880
BMP-1                                  4.0            880
BMP-1                                  4.01           4397
BMP-1                                  7.0            4397

[TIMESERIES]
;;Name                  Date           Time           Value
;;--------------        ----------     ----------     ----------
BONITA_GAGE             10/3/1970      5:00           0.01
BONITA_GAGE             10/3/1970      6:00           0.02
BONITA_GAGE             10/3/1970      7:00           0.01
BONITA_GAGE             10/3/1970      16:00          0.02
BONITA_GAGE             10/24/1970     8:00           0.01
BONITA_GAGE             11/25/1970     23:00          0.1
BONITA_GAGE             11/26/1970     4:00           0.1
```

Rain Gauge data has been appended as the full time series is 100+ pages long. The full set is included in the SD in the binder pocket.

Pre-project Flow Frequency - Long-term Simulation

Statistics - Node EX-POC Total Inflow

Rank	Start Date	Event Duration (hours)	Event Peak (CFS)	Exceedance Frequency (percent)	Return Period (years)
1/1/1900	3/1/1983	30	3.512	1.35	39
2	11/25/1985	16	1.654	2.7	19.5
3	1/11/2005	4	1.542	4.05	13
4	3/24/1983	1	1.509	5.41	9.75
5	12/21/1970	2	1.391	6.76	7.8
6	10/19/2004	31	1.286	8.11	6.5
7	1/16/1978	2	1.244	9.46	5.57
8	11/11/1972	1	1.144	10.81	4.88
9	2/28/1991	11	1.058	12.16	4.33
10	1/3/2005	21	1.055	13.51	3.9
11	4/1/1982	2	1.019	14.86	3.55
12	2/21/2005	3	0.995	16.22	3.25
13	3/27/1991	2	0.984	17.57	3
14	3/2/2004	2	0.983	18.92	2.79
15	8/16/1977	3	0.947	20.27	2.6
16	3/19/1983	1	0.923	21.62	2.44
17	2/22/2004	5	0.922	22.97	2.29
18	2/19/1993	2	0.863	24.32	2.17
19	1/31/1979	11	0.84	25.68	2.05
20	12/7/1992	3	0.778	27.03	1.95
21	1/29/1980	5	0.694	28.38	1.86
22	11/29/1970	3	0.686	29.73	1.77
23	2/23/2005	1	0.683	31.08	1.7
24	12/27/1984	21	0.624	32.43	1.63
25	4/28/1994	2	0.623	33.78	1.56
26	3/1/1978	1	0.608	35.14	1.5
27	1/4/1995	5	0.595	36.49	1.44
28	3/1/1981	10	0.578	37.84	1.39
29	3/2/1992	4	0.493	39.19	1.34
30	12/4/1992	1	0.49	40.54	1.3
31	1/15/1993	19	0.451	41.89	1.26
32	3/6/1980	4	0.428	43.24	1.22
33	3/17/1982	5	0.424	44.59	1.18
34	3/10/1975	2	0.409	45.95	1.15
35	3/21/1983	1	0.393	47.3	1.11
36	11/10/1982	1	0.376	48.65	1.08
37	12/7/1986	1	0.365	50	1.05
38	3/7/1992	1	0.353	51.35	1.03
39	9/10/1976	14	0.341	52.7	1
40	2/20/1980	21	0.341	54.05	0.98
41	2/6/1992	4	0.339	55.41	0.95
42	12/29/1977	1	0.319	56.76	0.93
43	11/12/1976	1	0.308	58.11	0.91
44	3/7/1974	1	0.307	59.46	0.89
45	2/10/1978	2	0.305	60.81	0.87
46	1/29/1983	1	0.266	62.16	0.85
47	8/14/1983	1	0.263	63.51	0.83
48	1/25/1995	2	0.245	64.86	0.81
49	12/11/1984	4	0.223	66.22	0.8
50	1/12/1993	3	0.222	67.57	0.78
51	3/5/2000	1	0.216	68.92	0.76
52	3/16/1986	1	0.197	70.27	0.75
53	2/26/1987	1	0.159	71.62	0.74
54	2/26/2004	1	0.155	72.97	0.72
55	10/23/1976	1	0.14	74.32	0.71
56	1/1/1982	2	0.137	75.68	0.7
57	3/20/1973	1	0.117	77.03	0.68
58	11/14/1978	1	0.115	78.38	0.67
59	3/20/1991	1	0.108	79.73	0.66
60	3/5/1978	1	0.105	81.08	0.65
61	10/30/1998	1	0.102	82.43	0.64
62	12/19/1970	1	0.099	83.78	0.63
64	1/6/1993	17	0.097	86.49	0.61
64	1/7/1974	25	0.097	86.49	0.61
65	10/11/1987	1	0.096	87.84	0.6
66	2/8/1976	3	0.091	89.19	0.59
67	3/11/1978	3	0.087	90.54	0.58
68	4/29/1980	1	0.085	91.89	0.57
69	2/2/1988	2	0.06	93.24	0.57
70	11/22/1984	1	0.052	94.59	0.56
71	1/15/1978	1	0.052	95.95	0.55
72	2/14/1995	1	0.024	97.3	0.54
73	10/10/1986	1	0.022	98.65	0.53

10-year Q:	1.512	cfs	(Adjust Column "I" to interpolate from Table)
5-year Q:	1.161	cfs	
2-year Q:	0.809	cfs	
Lower Flow Threshold:	10%		
0.1xQ2 (Pre):	0.081	cfs	

Post-project (Mitigated) Flow Frequency - Long-term Simulation

Statistics - Node prop-poc Total Inflow

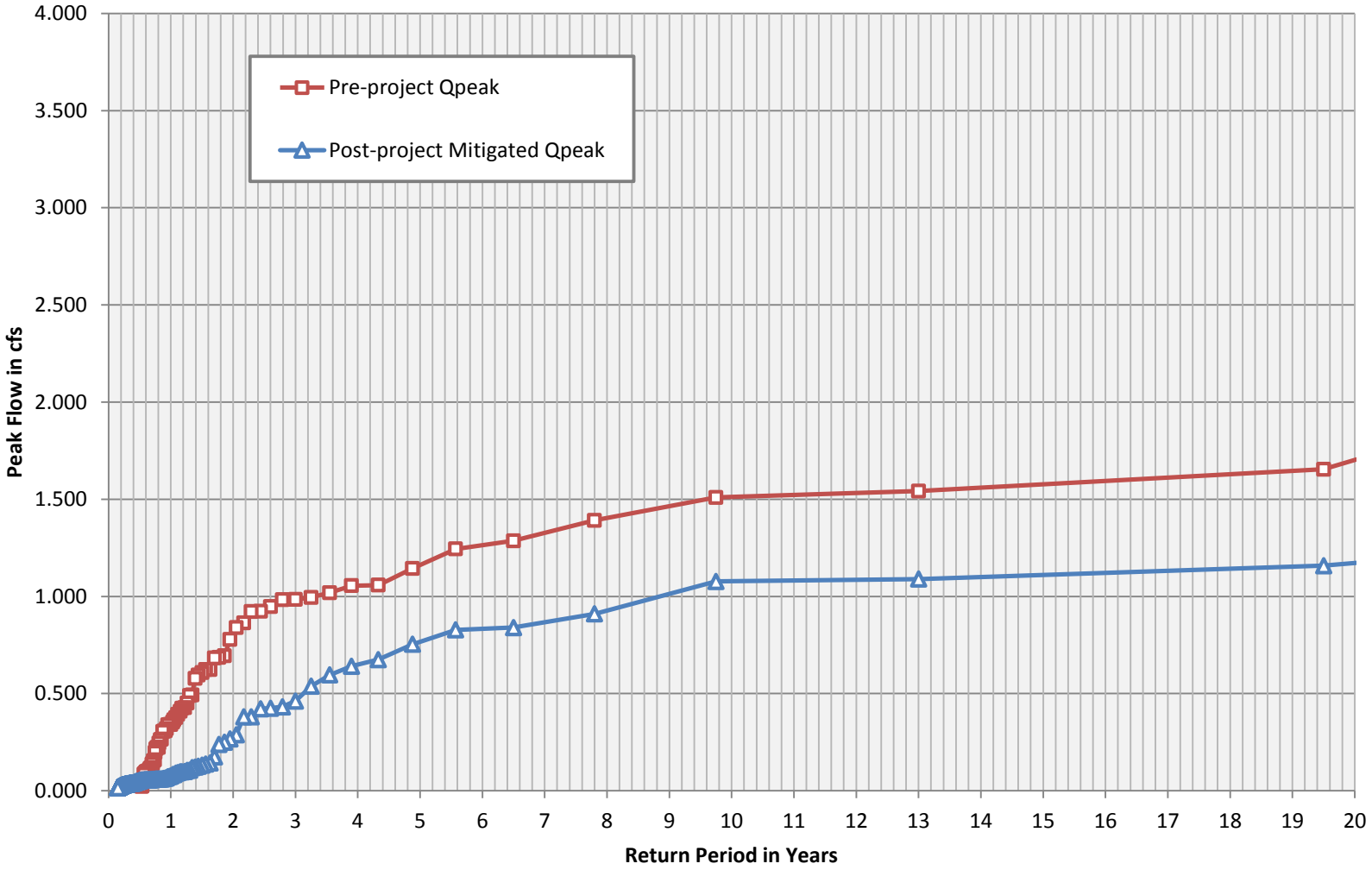
Rank	Start Date	Event Duration (hours)	Event Peak (CFS)	Exceedance Frequency (percent)	Return Period (years)
1	11/25/1985	67	1.68	0.38	39
2	12/7/1992	56	1.158	0.75	19.5
3	1/31/1979	86	1.089	1.13	13
4	3/1/1983	102	1.077	1.51	9.75
5	2/27/1991	91	0.91	1.89	7.8
6	2/6/1992	55	0.84	2.26	6.5
7	10/19/2004	90	0.828	2.64	5.57
8	2/22/2004	64	0.754	3.02	4.88
9	1/11/2005	55	0.675	3.4	4.33
10	12/28/2004	61	0.641	3.77	3.9
11	1/14/1978	111	0.596	4.15	3.55
12	1/15/1993	96	0.538	4.53	3.25
13	12/19/1970	100	0.462	4.91	3
14	1/29/1980	77	0.432	5.28	2.79
15	1/3/1995	82	0.425	5.66	2.6
16	2/21/2005	95	0.422	6.04	2.44
17	3/17/1982	75	0.38	6.42	2.29
18	12/27/1984	73	0.38	6.79	2.17
19	2/5/1976	174	0.288	7.17	2.05
20	1/6/1993	95	0.267	7.55	1.95
21	3/2/1992	59	0.25	7.92	1.86
22	11/11/1985	58	0.238	8.3	1.77
23	3/6/1980	55	0.174	8.68	1.7
24	3/4/2005	55	0.143	9.06	1.63
25	3/24/1983	44	0.137	9.43	1.56
26	1/3/2005	74	0.132	9.81	1.5
27	3/25/1991	93	0.126	10.19	1.44
28	11/11/1972	52	0.122	10.57	1.39
29	8/16/1977	59	0.119	10.94	1.34
30	11/29/1970	38	0.106	11.32	1.3
31	3/5/1995	61	0.104	11.7	1.26
32	2/27/1978	88	0.099	12.08	1.22
33	4/1/1982	34	0.098	12.45	1.18
34	3/18/1983	49	0.097	12.83	1.15
35	3/2/2004	31	0.093	13.21	1.11
36	3/1/1981	52	0.091	13.58	1.08
37	2/19/1993	41	0.084	13.96	1.05
38	3/10/1975	57	0.083	14.34	1.03
39	2/15/1986	58	0.076	14.72	1
40	1/25/1995	53	0.073	15.09	0.98
41	12/10/1984	60	0.072	15.47	0.95
42	11/12/1976	49	0.067	15.85	0.93
43	12/4/1992	40	0.065	16.23	0.91
44	12/6/1986	55	0.064	16.6	0.89
45	1/12/1993	64	0.062	16.98	0.87
46	10/27/2004	55	0.061	17.36	0.85
47	2/19/1980	64	0.061	17.74	0.83
48	11/10/1982	40	0.061	18.11	0.81
49	3/15/2003	59	0.06	18.49	0.8
50	12/16/1987	63	0.06	18.87	0.78
51	2/10/1978	29	0.06	19.25	0.76
52	2/14/1995	51	0.059	19.62	0.75
53	11/21/1996	53	0.059	20	0.74
54	8/14/1983	45	0.059	20.38	0.72
55	2/2/1988	45	0.058	20.75	0.71
56	3/6/1975	65	0.058	21.13	0.7
57	4/28/1994	29	0.058	21.51	0.68
58	3/19/1991	97	0.057	21.89	0.67
59	1/25/1999	65	0.057	22.26	0.66
60	11/30/2007	48	0.057	22.64	0.65
61	3/20/1973	39	0.057	23.02	0.64
62	1/6/1979	45	0.057	23.4	0.63
63	10/30/1998	37	0.056	23.77	0.62
64	5/8/1977	39	0.056	24.15	0.61
65	4/14/2003	39	0.056	24.53	0.6
66	2/19/2007	49	0.056	24.91	0.59
67	12/25/1988	43	0.056	25.28	0.58
68	12/4/1972	37	0.055	25.66	0.57
69	3/10/1980	37	0.055	26.04	0.57
70	9/25/1986	37	0.055	26.42	0.56
71	3/5/1981	40	0.055	26.79	0.55
72	10/11/1987	56	0.055	27.17	0.54
73	2/2/1983	43	0.055	27.55	0.53
74	1/5/1987	39	0.054	27.92	0.53
75	12/17/1978	73	0.054	28.3	0.52
76	1/20/1982	45	0.054	28.68	0.51
77	9/10/1976	40	0.054	29.06	0.51
78	2/25/1987	36	0.053	29.43	0.5
79	1/6/2008	39	0.051	29.81	0.49
80	1/5/1992	39	0.051	30.19	0.49
81	3/11/1995	50	0.049	30.57	0.48
82	10/10/1986	32	0.049	30.94	0.48
83	3/7/1974	29	0.049	31.32	0.47
84	10/30/1996	31	0.048	31.7	0.46
85	1/12/1997	33	0.048	32.08	0.46
86	1/10/1995	64	0.048	32.45	0.45
87	3/21/1983	25	0.047	32.83	0.45
88	11/25/1983	30	0.047	33.21	0.44
89	11/20/1983	45	0.046	33.58	0.44
90	3/14/1982	38	0.045	33.96	0.43
91	2/17/1990	28	0.045	34.34	0.43
92	3/7/1992	18	0.043	34.72	0.42
93	3/12/1978	35	0.042	35.09	0.42
94	1/7/1974	51	0.042	35.47	0.41
95	12/29/1977	20	0.042	35.85	0.41
96	2/12/1992	32	0.041	36.23	0.41
97	2/17/1994	48	0.041	36.6	0.4
98	12/12/1985	29	0.041	36.98	0.4
99	1/9/1978	38	0.041	37.36	0.39
100	1/19/1973	25	0.04	37.74	0.39
101	3/5/2000	26	0.04	38.11	0.39
102	1/29/1983	27	0.04	38.49	0.38

10-year Q:	1.078	cfs	(Adjust Column "I" to interpolate from Table)
5-year Q:	0.767	cfs	
2-year Q:	0.278	cfs	
Lower Flow Threshold:	10%		
0.1xQ2 (Post Mit):	0.028	cfs	

103	2/28/2006	34	0.039	38.87	0.38
104	1/26/1997	27	0.039	39.25	0.38
105	5/22/2006	23	0.039	39.62	0.37
106	1/1/1982	35	0.039	40	0.37
107	4/12/1999	24	0.039	40.38	0.36
108	3/27/1981	24	0.039	40.75	0.36
109	3/4/1978	30	0.039	41.13	0.36
110	1/31/1986	25	0.039	41.51	0.35
111	2/26/2004	24	0.039	41.89	0.35
112	1/4/1974	29	0.038	42.26	0.35
113	3/11/1973	34	0.038	42.64	0.35
114	1/17/1988	32	0.038	43.02	0.34
115	2/23/1993	32	0.038	43.4	0.34
116	3/26/1993	27	0.038	43.77	0.34
117	1/27/2008	29	0.038	44.15	0.33
118	4/20/1988	42	0.037	44.53	0.33
119	3/17/1979	24	0.037	44.91	0.33
120	4/20/1983	30	0.037	45.28	0.32
121	4/13/1976	23	0.037	45.66	0.32
122	3/13/1996	23	0.036	46.04	0.32
123	4/4/2006	27	0.036	46.42	0.32
124	3/20/1992	21	0.036	46.79	0.31
125	10/27/1991	22	0.036	47.17	0.31
126	12/18/1984	50	0.036	47.55	0.31
127	12/29/1991	26	0.035	47.92	0.31
128	1/9/1980	28	0.035	48.3	0.3
129	3/19/1981	19	0.035	48.68	0.3
130	3/7/1994	21	0.035	49.06	0.3
131	1/14/1990	24	0.035	49.43	0.3
132	11/24/1978	23	0.035	49.81	0.3
133	12/25/1994	21	0.035	50.19	0.29
134	1/27/1983	23	0.035	50.57	0.29
135	10/22/1976	49	0.034	50.94	0.29
136	12/7/2007	19	0.034	51.32	0.29
137	2/3/2008	24	0.034	51.7	0.28
138	2/11/2005	47	0.033	52.08	0.28
139	4/3/1987	22	0.033	52.45	0.28
140	11/22/1984	28	0.033	52.83	0.28
141	12/19/1987	17	0.033	53.21	0.28
142	11/14/1978	22	0.033	53.58	0.27
143	2/22/2000	19	0.033	53.96	0.27
144	2/27/1983	32	0.033	54.34	0.27
145	4/29/1980	17	0.033	54.72	0.27
146	8/18/1983	18	0.032	55.09	0.27
147	10/6/1977	17	0.032	55.47	0.27
148	12/27/1971	17	0.032	55.85	0.26
149	1/31/1996	23	0.032	56.23	0.26
150	3/1/1979	18	0.032	56.6	0.26
151	1/16/1973	16	0.032	56.98	0.26
152	3/31/1978	31	0.032	57.36	0.26
153	2/2/1985	19	0.032	57.74	0.25
154	9/16/1978	16	0.032	58.11	0.25
155	1/15/1979	19	0.031	58.49	0.25
156	12/4/1974	17	0.031	58.87	0.25
157	3/21/1995	17	0.031	59.25	0.25
158	12/28/1992	16	0.031	59.62	0.25
159	1/9/2005	16	0.031	60	0.25
160	11/29/1985	17	0.031	60.38	0.24
161	4/29/1983	15	0.031	60.75	0.24
162	1/30/1986	15	0.031	61.13	0.24
163	10/26/1996	15	0.031	61.51	0.24
164	3/1/1976	17	0.03	61.89	0.24
165	12/3/1983	17	0.03	62.26	0.24
166	3/26/1992	22	0.03	62.64	0.23
167	4/15/1988	14	0.03	63.02	0.23
168	11/18/1973	15	0.03	63.4	0.23
169	4/1/1999	16	0.03	63.77	0.23
170	1/31/2007	16	0.029	64.15	0.23
171	1/28/1982	18	0.029	64.53	0.23
172	1/18/1990	14	0.029	64.91	0.23
173	3/22/2005	14	0.029	65.28	0.23
174	3/16/1986	16	0.029	65.66	0.22
175	2/18/2005	15	0.029	66.04	0.22
176	3/10/1986	15	0.029	66.42	0.22
177	2/10/1992	16	0.029	66.79	0.22
178	2/24/1983	14	0.029	67.17	0.22
179	11/29/1981	13	0.028	67.55	0.22
180	1/3/1991	25	0.028	67.92	0.22
181	3/26/1980	12	0.028	68.3	0.22
182	4/6/1986	12	0.028	68.68	0.21
183	11/16/1972	13	0.027	69.06	0.21
184	12/17/1991	16	0.027	69.43	0.21
185	11/18/1986	12	0.027	69.81	0.21
186	10/29/1974	12	0.027	70.19	0.21
187	11/30/1982	13	0.027	70.57	0.21
188	2/15/1992	12	0.027	70.94	0.21
189	10/14/2006	15	0.026	71.32	0.21
190	1/23/2008	11	0.026	71.7	0.21
191	12/2/1985	17	0.026	72.08	0.2
192	2/12/2000	11	0.026	72.45	0.2
193	3/2/1988	11	0.026	72.83	0.2
194	2/15/1973	9	0.025	73.21	0.2
195	2/8/1993	10	0.025	73.58	0.2
196	11/22/1973	10	0.025	73.96	0.2
197	9/22/1987	10	0.025	74.34	0.2
198	12/4/1980	9	0.025	74.72	0.2
199	11/21/1978	9	0.024	75.09	0.2
200	4/17/2000	9	0.024	75.47	0.19
201	3/28/1993	9	0.024	75.85	0.19
202	6/10/1990	11	0.024	76.23	0.19
203	3/11/2006	19	0.024	76.6	0.19
204	1/11/1980	12	0.024	76.98	0.19
205	12/25/1977	13	0.024	77.36	0.19
206	11/27/1981	8	0.023	77.74	0.19
207	4/18/1995	9	0.023	78.11	0.19
208	12/9/1982	21	0.023	78.49	0.19
209	2/13/1978	11	0.023	78.87	0.19
210	11/8/1998	9	0.023	79.25	0.19
211	2/7/1978	8	0.023	79.62	0.18
212	3/13/1991	7	0.022	80	0.18
213	11/25/1988	7	0.022	80.38	0.18

214	3/8/1992	10	0.022	80.75	0.18
215	1/8/1995	8	0.022	81.13	0.18
216	12/17/1970	7	0.022	81.51	0.18
217	4/9/1975	6	0.022	81.89	0.18
218	3/3/1976	16	0.022	82.26	0.18
219	2/8/1983	7	0.022	82.64	0.18
220	11/21/1984	6	0.021	83.02	0.18
221	2/9/1981	10	0.021	83.4	0.18
222	12/16/1984	9	0.021	83.77	0.18
223	10/20/1979	6	0.021	84.15	0.17
224	12/26/1977	8	0.021	84.53	0.17
225	1/29/1981	6	0.021	84.91	0.17
226	3/19/1979	7	0.021	85.28	0.17
227	3/16/1986	6	0.021	85.66	0.17
228	11/13/1972	8	0.021	86.04	0.17
229	12/11/1993	6	0.021	86.42	0.17
230	1/6/2008	6	0.02	86.79	0.17
231	3/8/1986	6	0.02	87.17	0.17
232	11/11/1978	9	0.02	87.55	0.17
233	2/16/1980	7	0.02	87.92	0.17
234	11/28/1981	6	0.02	88.3	0.17
235	2/8/1993	7	0.02	88.68	0.17
236	2/25/1981	5	0.02	89.06	0.17
237	2/8/1994	8	0.02	89.43	0.16
238	1/18/1979	5	0.019	89.81	0.16
239	12/28/1977	5	0.019	90.19	0.16
240	4/7/1975	5	0.019	90.57	0.16
241	1/17/1990	8	0.019	90.94	0.16
242	3/8/1973	4	0.018	91.32	0.16
243	1/9/1991	3	0.018	91.7	0.16
244	11/24/1984	7	0.018	92.08	0.16
245	3/29/2006	4	0.018	92.45	0.16
246	12/31/2004	4	0.018	92.83	0.16
247	1/5/2008	3	0.018	93.21	0.16
248	6/6/1993	2	0.018	93.58	0.16
249	3/25/1999	3	0.018	93.96	0.16
250	4/16/1995	3	0.018	94.34	0.16
251	3/25/1989	2	0.017	94.72	0.16
252	11/26/1970	1	0.017	95.09	0.15
253	4/7/1978	2	0.017	95.47	0.15
254	12/24/1983	2	0.017	95.85	0.15
255	12/6/1996	2	0.017	96.23	0.15
256	1/21/1996	3	0.017	96.6	0.15
257	4/25/1994	2	0.016	96.98	0.15
258	11/12/2003	1	0.016	97.36	0.15
259	2/3/2004	2	0.016	97.74	0.15
260	1/28/1981	1	0.016	98.11	0.15
261	11/17/1984	1	0.016	98.49	0.15
262	7/14/1984	1	0.015	98.87	0.15
263	3/28/1979	1	0.015	99.25	0.15
264	2/14/1980	1	0.015	99.62	0.15

Peak Flow Frequency Curves



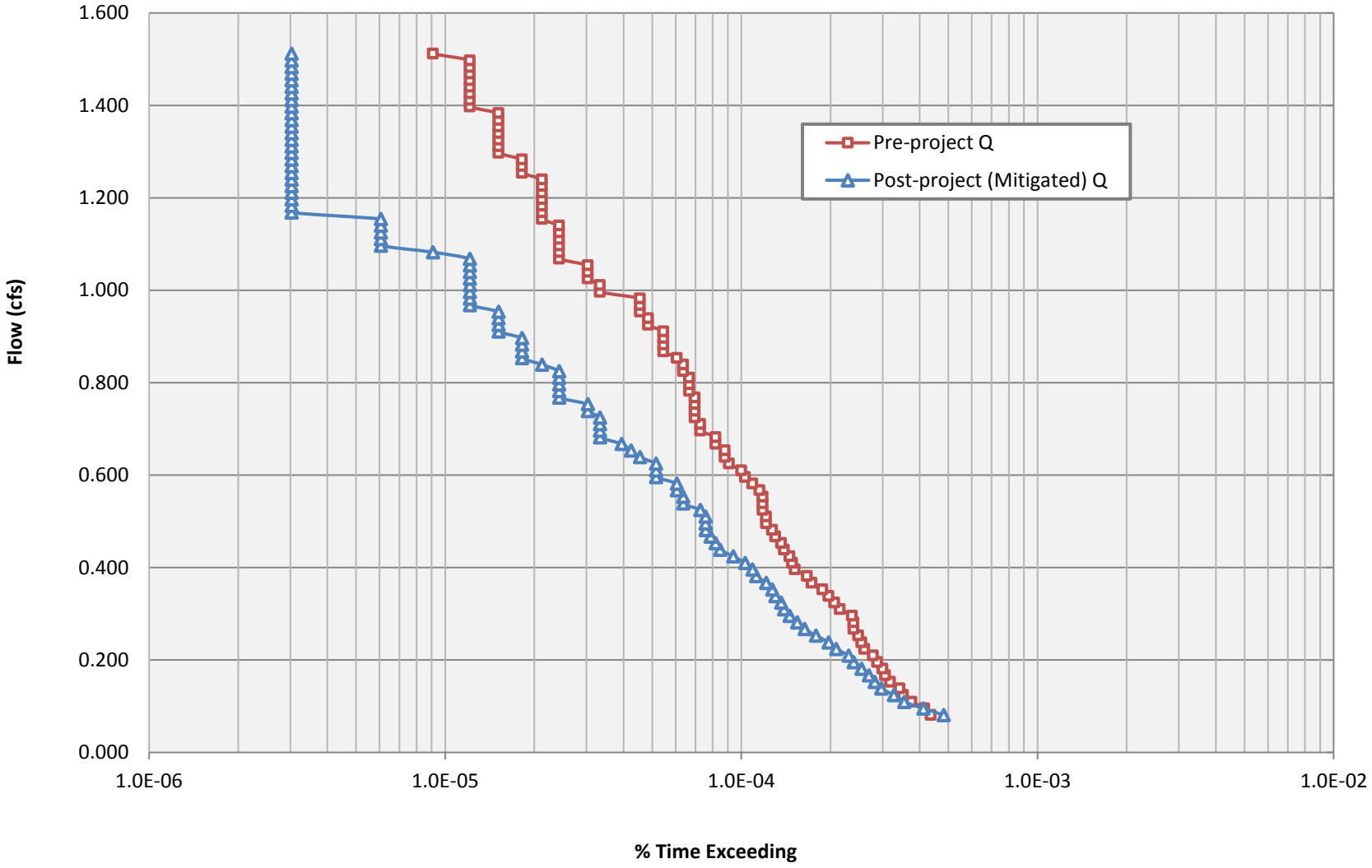
Low-flow Threshold:	10%	
0.1xQ2 (Pre):	0.081	cfs
Q10 (Pre):	1.512	cfs
Ordinate #:	100	
Incremental Q (Pre):	0.01431	64
Total Hourly Data:	329993	hours

The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	0.081	144	4.36E-04	159	4.82E-04	110%	Pass
1	0.095	137	4.15E-04	136	4.12E-04	99%	Pass
2	0.110	124	3.76E-04	117	3.55E-04	94%	Pass
3	0.124	116	3.52E-04	108	3.27E-04	93%	Pass
4	0.138	113	3.42E-04	98	2.97E-04	87%	Pass
5	0.152	105	3.18E-04	93	2.82E-04	89%	Pass
6	0.167	101	3.06E-04	89	2.70E-04	88%	Pass
7	0.181	99	3.00E-04	84	2.55E-04	85%	Pass
8	0.195	95	2.88E-04	79	2.39E-04	83%	Pass
9	0.210	92	2.79E-04	76	2.30E-04	83%	Pass
10	0.224	86	2.61E-04	69	2.09E-04	80%	Pass
11	0.238	84	2.55E-04	65	1.97E-04	77%	Pass
12	0.253	82	2.48E-04	59	1.79E-04	72%	Pass
13	0.267	79	2.39E-04	54	1.64E-04	68%	Pass
14	0.281	79	2.39E-04	51	1.55E-04	65%	Pass
15	0.295	78	2.36E-04	48	1.45E-04	62%	Pass
16	0.310	71	2.15E-04	46	1.39E-04	65%	Pass
17	0.324	68	2.06E-04	45	1.36E-04	66%	Pass
18	0.338	65	1.97E-04	43	1.30E-04	66%	Pass
19	0.353	62	1.88E-04	42	1.27E-04	68%	Pass
20	0.367	57	1.73E-04	40	1.21E-04	70%	Pass
21	0.381	55	1.67E-04	37	1.12E-04	67%	Pass
22	0.396	50	1.52E-04	36	1.09E-04	72%	Pass
23	0.410	49	1.48E-04	34	1.03E-04	69%	Pass
24	0.424	48	1.45E-04	31	9.39E-05	65%	Pass
25	0.439	46	1.39E-04	28	8.49E-05	61%	Pass
26	0.453	45	1.36E-04	27	8.18E-05	60%	Pass
27	0.467	43	1.30E-04	26	7.88E-05	60%	Pass
28	0.481	42	1.27E-04	25	7.58E-05	60%	Pass
29	0.496	40	1.21E-04	25	7.58E-05	63%	Pass
30	0.510	40	1.21E-04	25	7.58E-05	63%	Pass
31	0.524	39	1.18E-04	24	7.27E-05	62%	Pass
32	0.539	39	1.18E-04	21	6.36E-05	54%	Pass
33	0.553	39	1.18E-04	21	6.36E-05	54%	Pass
34	0.567	38	1.15E-04	20	6.06E-05	53%	Pass
35	0.582	36	1.09E-04	20	6.06E-05	56%	Pass
36	0.596	34	1.03E-04	17	5.15E-05	50%	Pass
37	0.610	33	1.00E-04	17	5.15E-05	52%	Pass
38	0.625	30	9.09E-05	17	5.15E-05	57%	Pass
39	0.639	29	8.79E-05	15	4.55E-05	52%	Pass
40	0.653	29	8.79E-05	14	4.24E-05	48%	Pass
41	0.667	27	8.18E-05	13	3.94E-05	48%	Pass
42	0.682	27	8.18E-05	11	3.33E-05	41%	Pass
43	0.696	24	7.27E-05	11	3.33E-05	46%	Pass
44	0.710	24	7.27E-05	11	3.33E-05	46%	Pass
45	0.725	23	6.97E-05	11	3.33E-05	48%	Pass
46	0.739	23	6.97E-05	10	3.03E-05	43%	Pass
47	0.753	23	6.97E-05	10	3.03E-05	43%	Pass
48	0.768	23	6.97E-05	8	2.42E-05	35%	Pass
49	0.782	22	6.67E-05	8	2.42E-05	36%	Pass
50	0.796	22	6.67E-05	8	2.42E-05	36%	Pass
51	0.811	22	6.67E-05	8	2.42E-05	36%	Pass
52	0.825	21	6.36E-05	8	2.42E-05	38%	Pass
53	0.839	21	6.36E-05	7	2.12E-05	33%	Pass
54	0.853	20	6.06E-05	6	1.82E-05	30%	Pass

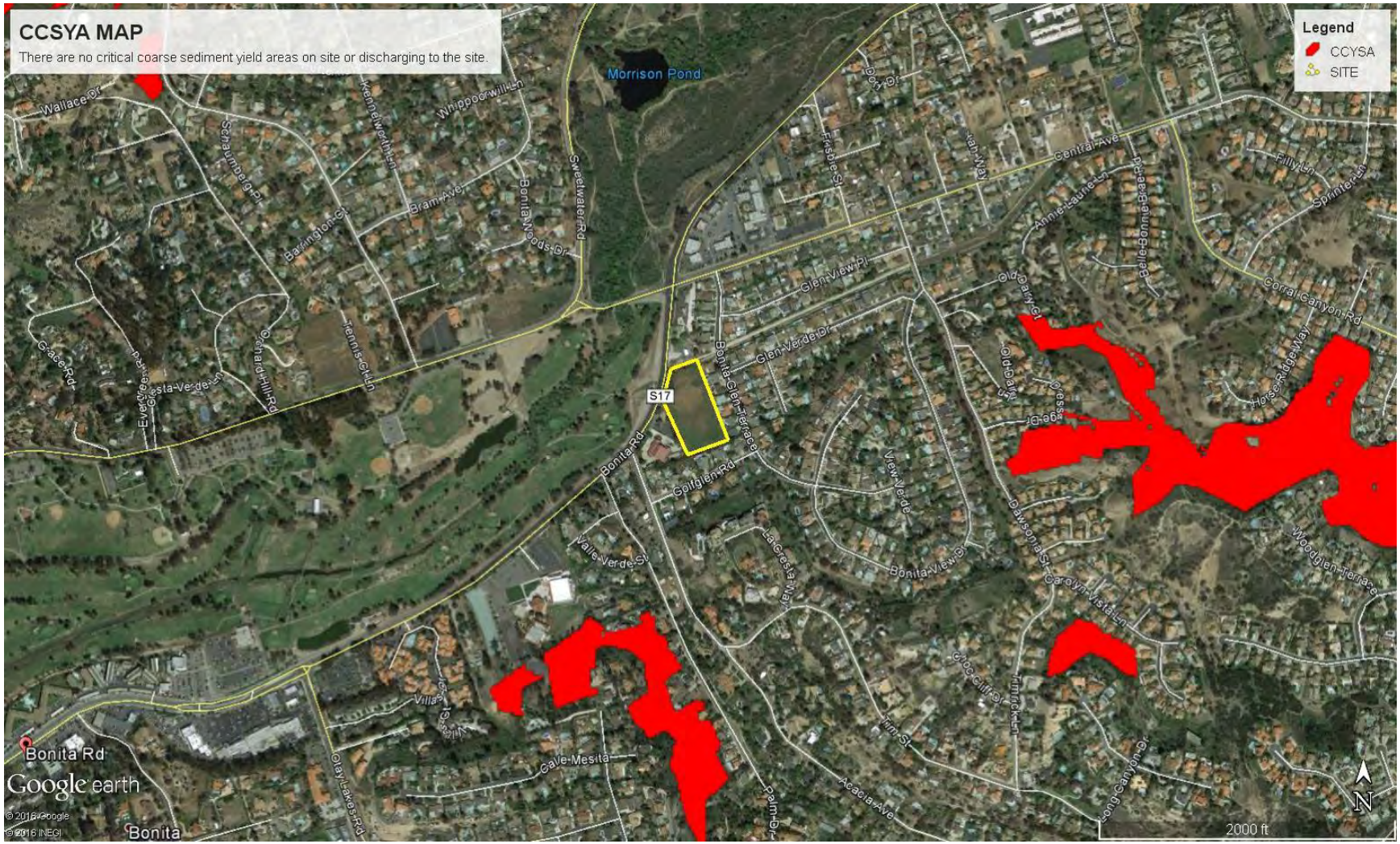
Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
55	0.868	18	5.45E-05	6	1.82E-05	33%	Pass
56	0.882	18	5.45E-05	6	1.82E-05	33%	Pass
57	0.896	18	5.45E-05	6	1.82E-05	33%	Pass
58	0.911	18	5.45E-05	5	1.52E-05	28%	Pass
59	0.925	16	4.85E-05	5	1.52E-05	31%	Pass
60	0.939	16	4.85E-05	5	1.52E-05	31%	Pass
61	0.954	15	4.55E-05	5	1.52E-05	33%	Pass
62	0.968	15	4.55E-05	4	1.21E-05	27%	Pass
63	0.982	15	4.55E-05	4	1.21E-05	27%	Pass
64	0.997	11	3.33E-05	4	1.21E-05	36%	Pass
65	1.011	11	3.33E-05	4	1.21E-05	36%	Pass
66	1.025	10	3.03E-05	4	1.21E-05	40%	Pass
67	1.039	10	3.03E-05	4	1.21E-05	40%	Pass
68	1.054	10	3.03E-05	4	1.21E-05	40%	Pass
69	1.068	8	2.42E-05	4	1.21E-05	50%	Pass
70	1.082	8	2.42E-05	3	9.09E-06	38%	Pass
71	1.097	8	2.42E-05	2	6.06E-06	25%	Pass
72	1.111	8	2.42E-05	2	6.06E-06	25%	Pass
73	1.125	8	2.42E-05	2	6.06E-06	25%	Pass
74	1.140	8	2.42E-05	2	6.06E-06	25%	Pass
75	1.154	7	2.12E-05	2	6.06E-06	29%	Pass
76	1.168	7	2.12E-05	1	3.03E-06	14%	Pass
77	1.182	7	2.12E-05	1	3.03E-06	14%	Pass
78	1.197	7	2.12E-05	1	3.03E-06	14%	Pass
79	1.211	7	2.12E-05	1	3.03E-06	14%	Pass
80	1.225	7	2.12E-05	1	3.03E-06	14%	Pass
81	1.240	7	2.12E-05	1	3.03E-06	14%	Pass
82	1.254	6	1.82E-05	1	3.03E-06	17%	Pass
83	1.268	6	1.82E-05	1	3.03E-06	17%	Pass
84	1.283	6	1.82E-05	1	3.03E-06	17%	Pass
85	1.297	5	1.52E-05	1	3.03E-06	20%	Pass
86	1.311	5	1.52E-05	1	3.03E-06	20%	Pass
87	1.326	5	1.52E-05	1	3.03E-06	20%	Pass
88	1.340	5	1.52E-05	1	3.03E-06	20%	Pass
89	1.354	5	1.52E-05	1	3.03E-06	20%	Pass
90	1.368	5	1.52E-05	1	3.03E-06	20%	Pass
91	1.383	5	1.52E-05	1	3.03E-06	20%	Pass
92	1.397	4	1.21E-05	1	3.03E-06	25%	Pass
93	1.411	4	1.21E-05	1	3.03E-06	25%	Pass
94	1.426	4	1.21E-05	1	3.03E-06	25%	Pass
95	1.440	4	1.21E-05	1	3.03E-06	25%	Pass
96	1.454	4	1.21E-05	1	3.03E-06	25%	Pass
97	1.469	4	1.21E-05	1	3.03E-06	25%	Pass
98	1.483	4	1.21E-05	1	3.03E-06	25%	Pass
99	1.497	4	1.21E-05	1	3.03E-06	25%	Pass
100	1.512	3	9.09E-06	1	3.03E-06	33%	Pass

Flow Duration Curve
[Pre vs. Post (Mitigated)]



REGION 9

CRITICAL COURSE SEDIMENT YIELD AREA MAP



Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Point(s) of Compliance (POC) for Hydromodification Management
☒ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☒ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required)	☐ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Stormwater Maintenance Notification / Agreement (when applicable)	☐ Included ☐ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the County's standard format depending on the Category (PDP applicant to contact County staff to obtain the current maintenance agreement forms). Refer to Section 7.3 in the BMP Design Manual for a description of the different categories.

ATTACHMENT 4

County of San Diego PDP Structural BMP Verification for Permitted Land Development Projects

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County of San Diego BMP Design Manual Verification Form	
Project Summary Information	
Project Name	Bonita Road Self-Storage
Record ID (e.g., grading/improvement plan number)	PDS2016-MUP-16-010 & PDS2016-ER-16-18-002
Project Address	Bonita Road, Near Central Road Bonita, CA 91902
Assessor's Parcel Number(s) (APN(s))	593-050-57
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Hydraulic Unit: Sweetwater, Hydraulic Area: Lower Sweetwater, Sub-area: La Nacion 909.12
Responsible Party for Construction Phase	
Developer's Name	
Address	
Email Address	
Phone Number	
Engineer of Work	Andrew J Kann
Engineer's Phone Number	(858) 634-8620
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	
Address	
Email Address	
Phone Number	
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

County of San Diego BMP Design Manual Verification Form Page 2 of 4					
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)					
Description/Type of Structural BMP	**Plan Sheet #**	**STRUCT-URAL BMP ID#**	**Maint-enance Category**	**Maintenance Agreement Recorded Doc #**	**Revisions**
Partial Retention	TBD	BMP-1			
Partial Retention	TBD	BMP-2			
*All Priority Development Projects (PDPs) require a Structural BMP					

Note: If this is a partial verification of Structural BMPs, provide a list and map denoting Structural BMPs that have already been submitted, those for this submission, and those anticipated in future submissions.

County of San Diego BMP Design Manual Verification Form Page 3 of 4

Checklist for Applicant to submit to PDCI:

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Stormwater Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign your name and seal.

Professional Engineer's Printed Name:

Patric de Boer

Professional Engineer's Signed Name:

[SEAL]

Date:

County of San Diego BMP Design Manual Verification Form Page 4 of 4

COUNTY - OFFICIAL USE ONLY:

For PDCI: Verification Package #: _____

PDCI Inspector: _____

Date Project has/expects to close: _____

Date verification received from EOW: _____

By signing below, PDCI Inspector concurs that every noted Structural BMP has been installed per plan.

PDCI Inspector's Signature: _____ Date: _____

FOR WPP:

Date Received from PDCI: _____

WPP Submittal Reviewer: _____

WPP Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

List **acceptable** Structural BMPs:

WPP Reviewer's Signature: _____ Date: _____

ATTACHMENT 5

Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design

This is the cover sheet for Attachment 5.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

- ☐ Structural BMP(s) with ID numbers matching Step 6 Summary of PDP Structural BMPs
- ☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☐ Details and specifications for construction of structural BMP(s)
- ☐ Signage indicating the location and boundary of structural BMP(s) as required by County staff
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☐ All BMPs must be fully dimensioned on the plans
- ☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
- ☐ Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

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ATTACHMENT 6

Copy of Project's Drainage Report

This is the cover sheet for Attachment 6.

If hardcopy or CD is not attached, the following information should be provided:

Title:
Prepared By:
Date:

BONITA ROAD SELF STORAGE
PRELIMINARY DRAINAGE STUDY

Date Prepared:
July 25, 2018

Permit No: PDS2016-MUP-16-010 & PDS2016-ER-16-18-002

Prepared for:
Brad Bailey
10035 Prospect Avenue, Suite 201
Santee, CA 92071
Ph: (619) 449-8785

Prepared By:
Omega Engineering Consultants
4340 Viewridge Ave, Suite B
San Diego, CA 92123
Ph: (858) 634-8620

Declaration of Responsible Charge:
I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current standards. I understand that the check of the project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as an engineer of work, of my responsibilities for project design.

Patric T. de Boer RCE 83583
Registration Expires 3-31-2019

Table of Contents

Appendices

Site & Project Description

This hydrology study has been prepared as part of the development of the vacant lot just northeast of the intersection of Bonita Rd. and Acacia St. in the County of San Diego (Lat: 32.666 Long: -117.022°). The project site is located within the Sweetwater Hydrologic Unit and Hydrologic Sub-Area 909.12. The project proposes the construction of a Self-Storage facility with three buildings and associated hardscape. See Figure No. 1 for Vicinity Map, Figure 2 for the existing drainage limits, and Figure 3 for the proposed drainage limits.

This project is not subject to requiring approval of construction under Regional Water Quality Control Board section 401 or 404. No construction over water bodies or dredging is to occur as part of this project.

Methodology

This drainage report has been prepared in accordance with the current County of San Diego Hydrology Manual. The Modified Rational Method (MRM) was used to compute the anticipated peak runoff flowrates. As the project is proposing onsite stormwater storage for flow attenuation, the MRM was not sufficient to calculate attenuated flows after flood routing is considered. RatHydro, a hydrology program provided by Rick Engineering was used to generate a hydrograph based on the peak flow rates determined in the MRM calculations.

This hydrograph was imported into Autodesk Hydraflow Hydrographs and run through the modeled detention element of the biofiltration basin. The resulting peak flow from this was input back into the MRM calculations and confluenced with the flow from the other basins.

See the attached calculations for particulars. The following references have been used in preparation of this report:

(1) Handbook of Hydraulics, E.F. Brater & H.W. King, 6th Ed., 1976.
(2) Modern Sewer Design, American Iron & Steel Institute, 1st Ed., 1980.
(3) County of San Diego Hydrology Manual, 2003

Culvert Design and Analysis

The storm drain culverts were sized using the K' values from King's Handbook Appendix 7-14, (Appendix 7.0 of this report). The following formula was used:

Q= (K'/n)*d^(8/3)*s^(0.5)
K'= Discharge Factor
d=Diameter of Conduit (ft)
n=Manning's Coefficient
Q=Runoff Discharge (cfs)
s=Pipe Slope (ft/ft)

Rational Method

Q=CIA

Where:

Q=peak discharge, in cubic feet per second (cfs)

C=runoff coefficient, proportion of the rainfall that runs off the surface (no units)

=(0.90*(% impervious)+Cp*(1-% Impervious)) page 5, County Hydrology Manual

I =average rainfall intensity for a duration equal to the Tc for the area, (in/hr)

= 7.44*P6*Tc-0.645

A = drainage area contributing to the design location, in acres

Cp= Pervious Coefficient Runoff Value, County of San Diego Hydrology Manual minimum of 0.35

$$Tc = \frac{1.8\,(1.1-C)*(Tc)^{0.5}*}{S^{0.33}}$$

S= Slope of drainage course*

Existing Conditions

The existing site consists of an unoccupied field split near the northern property line by an existing channel. The southern basin slopes at roughly 2% to the northwest and the northern basin that includes the channel slopes at 0.50% west. The project site is approximately 4.25 acres with no existing permanent structures or hardscape. The site is 100% pervious and is Type C soil. Offsite flow from portions of the adjacent lots is conveyed through the project site. The total area of analysis including offsite and onsite area is 5.43 acres

Proposed Conditions

The proposed site will consist of a self-storage facility with 3 separate buildings. The facility will be located on the southerly portion of the site, with no disturbance proposed in the drainage channel that bisects the northern portion of the site.

Runoff produced by the impervious areas of the project will drain to a single biofiltration basin located the northerly boundary of the project. The biofiltration basin will provide stormwater treatment to meet water quality objectives (see SWQMP), as well as stormwater storage and flow attenuation for the flow control that is detailed in this report. Offsite areas and pervious onsite areas drain to a private storm drain system that will convey runoff directly to a discharge point at the existing drainage channel north of the site. All flow that generated by the proposed area of analysis will confluence in the private storm drain system prior to discharge from the site.

Existing Runoff Analysis

The Modified Rational Method was used for calculating existing peak flow rates for the 100 year, 6 hour storm. Analysis of the existing conditions breaks the site into three separate drainage areas. The Soil Hydrologic Groups Map from the San Diego Hydrology Manual indicates group C soil

(soil map in Appendix 1.1). Per table 3-1 of the County Hydrology Manual, Runoff coefficients of 0.30 are to be used for undisturbed natural terrain. For basins with impervious area a weighted runoff coefficient was calculated using a value of 0.90 for impervious areas.

The existing area of analysis was found to have a overall time of concentration of 10.5 minutes. The confluenced peak flow generated by the existing area of analysis for the 100-year storm was found to be 9.85 cfs.

Existing Conditions Data Table

Basin	C	T	I	A	Q_{100}
EX-1	0.30	10.5	4.50	3.98	5.37
EX-2	0.67	5.0	7.25	0.68	3.06
EX-3	0.80	5.7	6.64	0.77	3.80

Confluenced Flow from all basins is 9.85 cfs.
See attached calculations for details.

Proposed Runoff Analysis

The proposed area of analysis was modeled as 5 separate basins, which confluence at various points on the project site before discharging to the earthen channel that runs through the site. Runoff Coefficients in the range of 0.30 to 0.82 were used for the proposed basins.

The proposed area of analysis was found to have a time of concentration of 9.1 minutes. The confluenced peak flow generated by the proposed area of analysis was found to be 19.06 cfs. As this rate higher than existing conditions, 100-year flow control was found to be necessary. Using RatHydro a program that generates hydrographs from Rational Method Data, a hydrograph of basin A-5 was generated. This hydrograph was input into Autodesk Hydraflow Hydrographs and run through a modeled storage element representing the biofiltration basin at the west end of the site. The outlet structure was modeled as a V-notch weir and a 1" low flow orifice.

The ponding of water and controlled outflow from the biofiltration basin attenuates the flow such that when confluenced with flows from the rest of the site, the total peak flowrate generated by the proposed site is less than or equal to the existing conditions. This will prevent negative impacts to downstream conveyances.

The proposed area of analysis was found to have an overall time of concentration of 9.1 minutes. The confluenced peak flow generated by the proposed area of analysis for the 100-year storm was found to be 19.06 cfs. This will be attenuated via onsite storage to 9.75 cfs.

Proposed Conditions Data Table

Basin	C	T	I	A	Q_{100}
A-1	0.30	9.0	4.94	0.40	0.60
A-2	0.74	5.7	6.64	0.77	3.80
A-3	0.62	5.0	7.25	0.68	3.06
A-4	0.30	5.0	7.25	0.23	0.49
A-5	0.82	9.1	4.92	3.35	4.24*

*Flow from basin A-5 to be attenuated from 13.55 cfs to 4.24 cfs through storage in a biofiltration basin and controlled release. All 5 basins confluence at various points onsite for a total mitigated Q_{100} at the discharge point of 9.76 cfs

See the attached calculations for details.

Results and Conclusions

The redevelopment of the site will result in an increase in generated peak flow rates for the 100-year, 6-hour storm event. This will be mitigated by storing the excess runoff in a biofiltration area and releasing it at a reduced rate. The result is a confluenced peak flow rate at the site discharge point that does not exceed the existing conditions.

The project will modify the onsite drainage pattern, but the discharge point will remain the same. Due to the measures taken to mitigate flow impacts, the project site is not anticipated to have a negative effect on the downstream receiving water.

The project is located in a flood hazard area (FEMA zone AE), but the proposed grading will import soil to raise the finish floor elevation of all structures on site above the base flood elevation. It is the opinion of Omega Engineering Consultants that the project will not cause adverse effects to the downstream facilities or receiving waters.

The project site is 1.5 miles downstream of the Sweetwater Dam. Per Figure S-6 of Chapter 7 of the County General Plan, the project is within an identified Dam Inundation Area. The failure of the dam would expose the people and structures onsite to significant risk of loss, injury or death involving flooding.

A separate Storm Water Quality Management Plan (SWQMP) has been prepared to discuss the water quality impacts for the proposed development.

Bonita Self Storage
HYDROLOGY AND HYDRAULICS CALCS (Table No. 1)

7/25/2018

BASIN	AREA (SF)	AREA (AC)	% Imp	"C" Value
EX-1	173,360	3.98	0%	0.30
EX-2	29,798	0.68	53%	0.62
EX-3	33,545	0.77	74%	0.74
EX. TOTAL	**236,703**	**5.43**	17%	
A-1	17,611	0.40	0%	0.30
A-2	33,545	0.77	74%	0.74
A-3	29,798	0.68	53%	0.62
A-4	9,881	0.23	0%	0.30
A-5	145,878	3.35	87%	0.82
PROP TOTAL	**236,713**	**5.43**	71%	

Basin Confluence	Symbol
EXISTING	
(EX-1:EX-2)	ECP#1
(ECP#1:EX-3)	ECP#2
PROPOSED	
(A-1 & A-2)	CP#1
(CP#1 & A-3)	CP#2
(CP#2 & A-4)	CP#3
(CP#3 & A-5)	CP#4

(A) ECP # - Existing Confluence Point

(B) CP # - Proposed Confluence Point

(C) C value for bare ground is 0.30 (Table 3-1 County Hydrology Manual) (Type 'C' soil)

C value for impervious surfaces is 0.9

Basins with mixed surface type use a weighted average of these 2 values. (impervious % x 0.9)+(pervious % x 0.30)

Bonita Self Storage 7/25/2018

HYDROLOGY AND HYDRAULICS CALCS (Table No. 2)

Sub-Basin	AREA Ac.	"C"	CA	Overland flow length	Concentrated Flow Length, (ft)	H (ft) (elev)	S(%) (avg.)	Ti mins	Tt mins	T tot mins	I in/hr	Q cfs	Q tot cfs	NOTES 85TH
EX-1	3.98	0.30	1.19	100.0	560.0	12.00	2.1%	6.9	3.6	10.5	0.20	0.24	0.24	
EX-2	0.68	0.62	0.42	75.0	170.0	4.00	2.4%	4.0	0.9	5.0	0.20	0.08	0.08	
ECP #1										10.5	0.20		0.32	
EX-3	0.77	0.74	0.57	75.0	270.0	6.00	2.2%	4.0	1.7	5.7	0.20	0.11	0.11	
ECP #2										10.5	0.20		0.44	
									Existing Confluenced Runoff				**0.44**	
A-1	0.40	0.30	0.12	100.0	450.0	10.00	2.9%	6.9	2.1	9.0	0.20	0.02	0.02	
A-2	0.77	0.74	0.57	75.0	270.0	6.00	2.2%	4.0	1.7	5.7	0.20	0.11	0.11	
CP #1										5.7	0.20		0.14	
A-3	0.68	0.62	0.42	220.0	240.0	4.00	2.4%	4.0	0.9	5.0	0.20	0.08	0.08	
CP #2										5.0	0.20		0.22	
A-4	0.23	0.30	0.07	220.0	180.0	2.00	0.9%	4.1	0.9	5.0	0.20	0.01	0.01	
CP #3										5.0	0.20		0.24	
A-5	3.35	0.82	2.75	60.0	450.0	3.00	0.5%	4.1	2.1	6.2	0.20	0.55	0.55	
CP #4										5.0	0.20		0.79	
									Proposed Confluenced Runoff				**0.79**	

Bonita Self Storage 7/25/2018

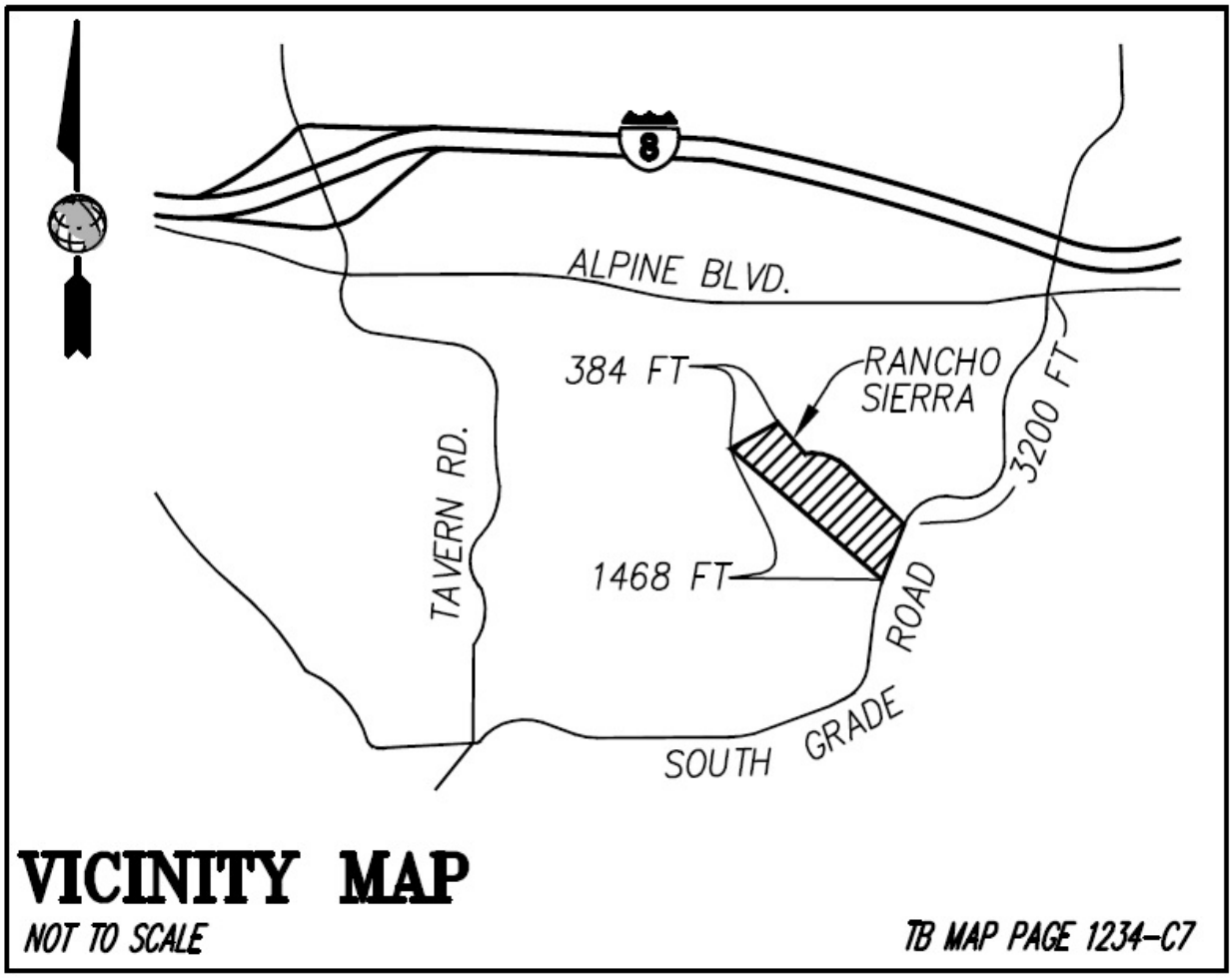
HYDROLOGY AND HYDRAULICS CALCS (Table No. 2)

Sub-Basin	AREA Ac.	"C"	CA	Overland flow length	Total Basin Flow Length, (ft)	H (ft) (elev)	S(%) (avg.)	Ti mins	Tc mins	T tot mins	I in/hr	Q cfs	Q tot cfs	NOTES 100-Year Storm P(6) 2.75
EX-1	3.98	0.30	1.19	100	560	12.00	2.1%	6.9	3.6	10.5	4.50	5.37	5.37	
EX-2	0.68	0.62	0.42	75	170	4.00	2.4%	4.0	0.9	5.0	7.25	3.06	3.06	
ECP #1										10.5	4.50		7.27	
EX-3	0.77	0.74	0.57	75	270	6.00	2.2%	4.0	1.7	5.7	6.64	3.80	3.80	
ECP #2										10.5	0.20		9.85	
									Existing Confluenced Runoff				**9.85**	
A-1	0.40	0.30	0.12	100	450	10.00	2.9%	6.9	2.1	9.0	4.94	0.60	0.60	
A-2	0.77	0.74	0.57	75	270	6.00	2.2%	4.0	1.7	5.7	6.64	3.80	3.80	
CP #1										5.7	6.64		4.18	
A-3	0.68	0.62	0.42	75	170	4.00	2.4%	4.0	0.9	5.0	7.25	3.06	3.06	
CP #2										5.7	6.64		6.99	
A-4	0.23	0.30	0.07	60	180	2.00	0.9%	4.1	0.9	5.0	7.25	0.49	0.49	
CP #3										5.7	6.64		7.44	
A-5	3.35	0.82	2.75	50	800	3.00	0.5%	5.3	3.8	9.1	4.92	13.55	13.55	
CP #4										9.1	4.92		19.06	
									Proposed Confluenced Runoff				**19.06**	

Bonita Self Storage 7/25/2018

HYDROLOGY AND HYDRAULICS CALCS (Table No. 2)

Sub-Basin	AREA Ac.	"C"	CA	Overland flow length	Total Basin Flow Length, (ft)	H (ft) (elev)	S(%) (avg.)	Ti mins	Tc mins	T tot mins	I in/hr	Q cfs	Q tot cfs	NOTES 100-Year Storm P(6) 2.75
EX-1	3.98	0.30	1.19	100	560	12.00	2.1%	6.9	3.6	10.5	4.50	5.37	5.37	
EX-2	0.68	0.62	0.42	75	170	4.00	2.4%	4.0	0.9	5.0	7.25	3.06	3.06	
ECP #1										10.5	4.50		7.27	
EX-3	0.77	0.74	0.57	75	270	6.00	2.2%	4.0	1.7	5.7	6.64	3.80	3.80	
ECP #2										10.5	0.20		9.85	
									Existing Confluenced Runoff				**9.85**	
A-1	0.40	0.30	0.12	100	450	10.00	2.9%	6.9	2.1	9.0	4.94	0.60	0.60	
A-2	0.77	0.74	0.57	75	270	6.00	2.2%	4.0	1.7	5.7	6.64	3.80	3.80	
CP #1										5.7	6.64		4.18	
A-3	0.68	0.62	0.42	75	170	4.00	2.4%	4.0	0.9	5.0	7.25	3.06	3.06	
CP #2										5.7	6.64		6.99	
A-4	0.23	0.30	0.07	60	180	2.00	0.9%	4.1	0.9	5.0	7.25	0.49	0.49	
CP #3										5.7	6.64		7.44	
A-5	3.35	0.82	2.75	50	800	3.00	0.5%	5.3	3.8	9.1	4.92	13.55	4.24	*Mitigated by outlet control see Hydraflow Hydrographs calculation for pond routing
CP #4										9.1	4.92		9.76	
									Proposed Confluenced Runoff				**9.76**	

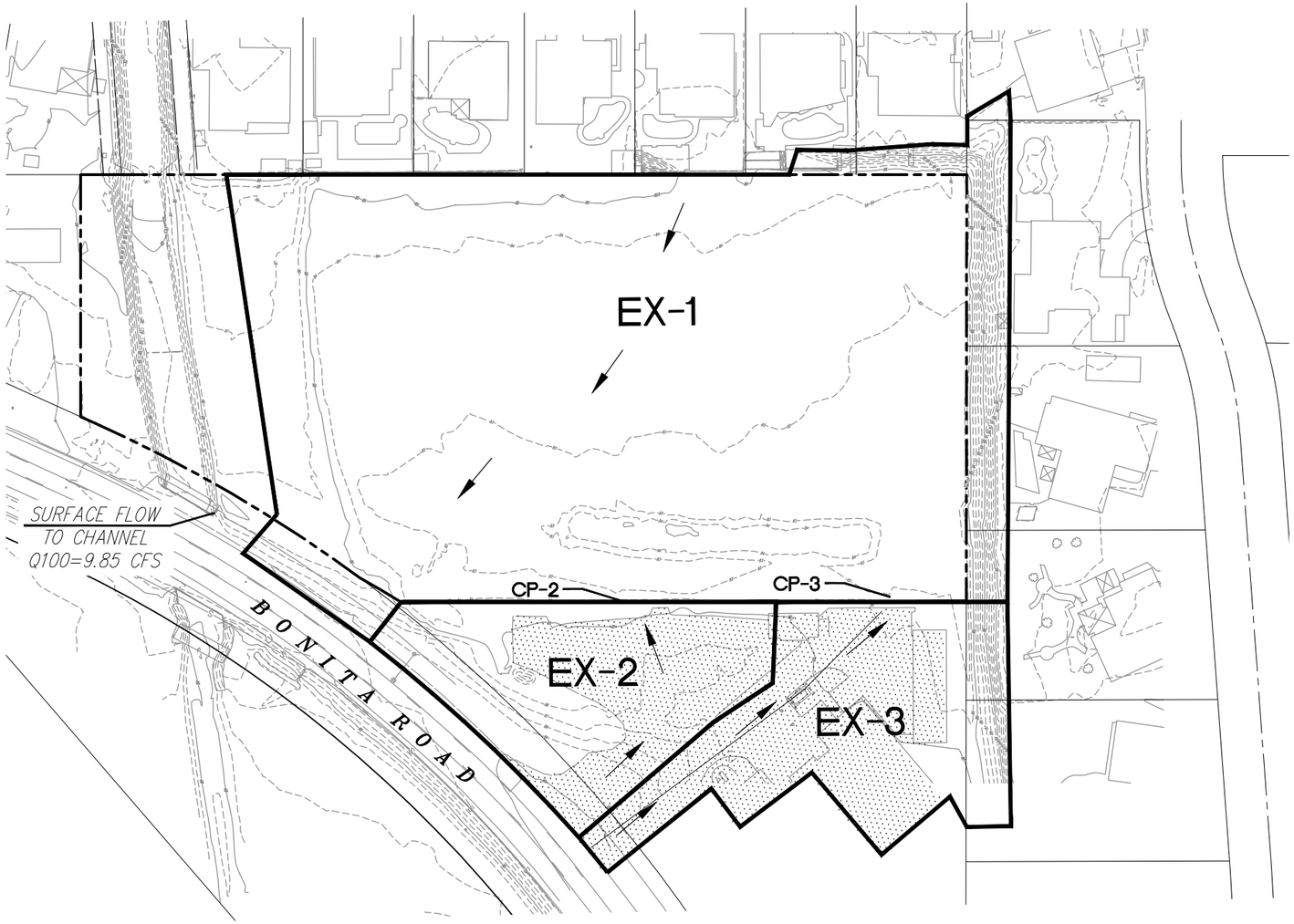


VICINITY MAP

NOT TO SCALE

TB MAP PAGE 1234-C7

BONITA SELF STORAGE
EXISTING HYDROLOGY EXHIBIT



LEGEND:

- PROJECT BOUNDARY
- AREA LIMITS
- DRAINAGE DIRECTION ARROW
- BASIN NUMBER — EX-#
- PAVEMENT AREA
- PERVIOUS AREA

TABLE OF BASIN DATA

BASIN	AREA	IMPERVIOUS %	Q_{100}
EX-1	3.98 AC	0%	5.37 CFS
EX-2	0.68 AC	53%	3.06 CFS
EX-3	0.77 AC	74%	3.80 CFS
TOTAL	5.43 AC	17%	9.85 CFS

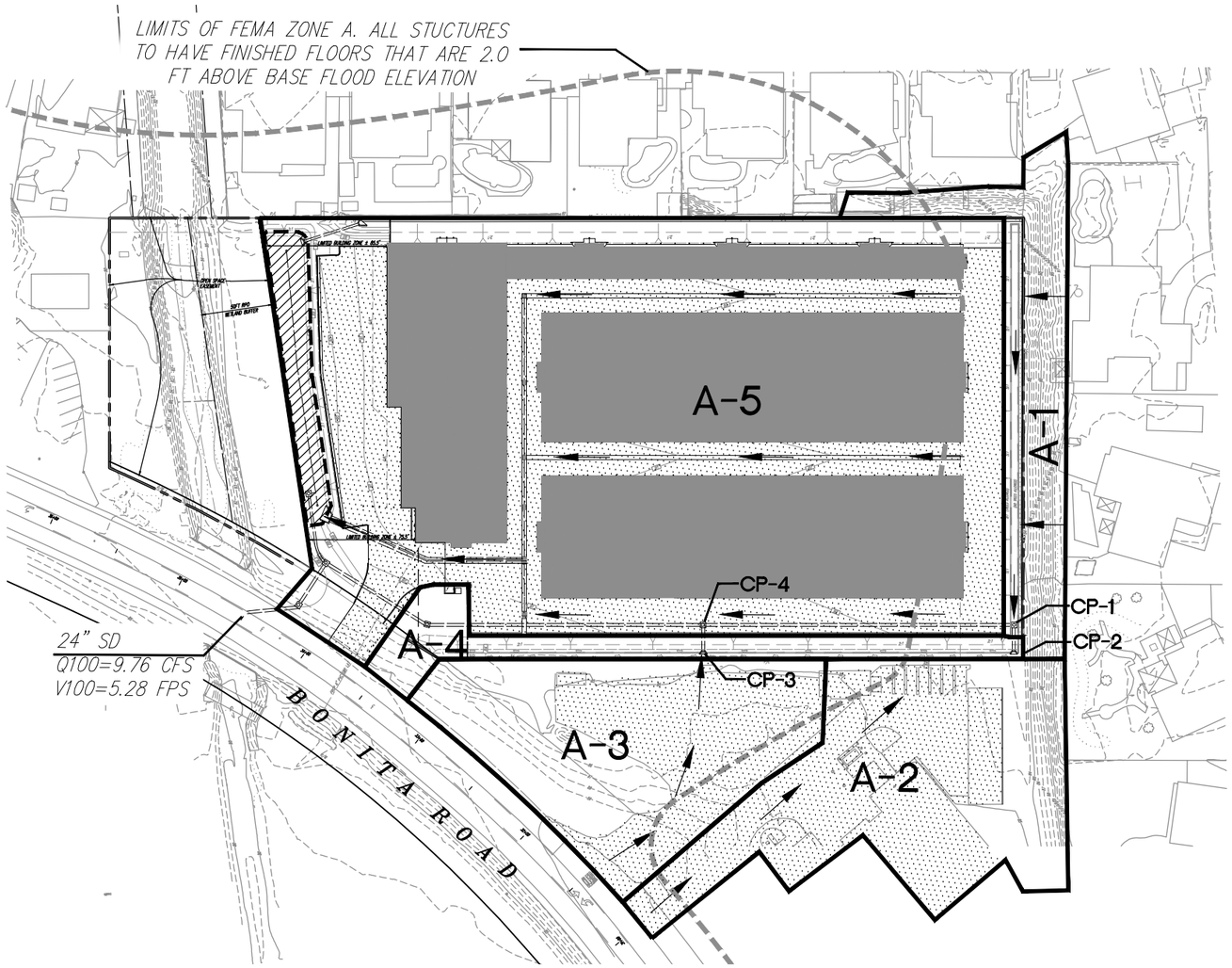
GRAPHICAL SCALE: 1" = 100'

0 50 100 200

OMEGA ENGINEERING CONSULTANTS
4340 VIEWRIDGE AVENUE, SUITE B
SAN DIEGO, CALIFORNIA 92123
PH:(858) 634-8620 FAX:(858) 634-8627

FIGURE 2

BONITA SELF STORAGE
PROPOSED HYDROLOGY EXHIBIT



LEGEND:

- PROJECT BOUNDARY
- AREA LIMITS
- DRAINAGE DIRECTION ARROW
- BASIN NUMBER — EX-#
- PAVEMENT AREA
- ROOFTOP AREA
- PERVIOUS AREA

TABLE OF BASIN DATA			
BASIN	AREA	IMPERVIOUS %	Q_{100}
A-1	0.30 AC	0%	0.60 CFS
A-2	0.74 AC	74%	3.80 CFS
A-3	0.62 AC	53%	3.06 CFS
A-4	0.30 AC	0%	0.49 CFS
A-5	0.82 AC	87%	4.24 CFS*
TOT:	5.43 AC	71%	9.76 CFS

* FLOW FROM BASIN A-4 PRIOR TO MITIGATION IS 13.55 CFS.

GRAPHICAL SCALE: 1" = 100'

0 50 100 200

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FIGURE 3

UNMITIGATED HYDROGRAPH FOR BASIN A-5

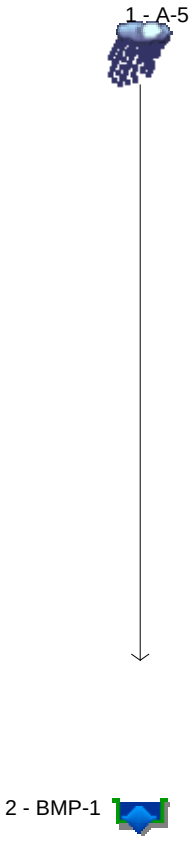
TIME OF CONCENTRATION 9 MIN
6 HR RAINFALL 2.75 INCHES
BASIN AREA 3.35 ACRES
RUNOFF COEFFICIENT 0.82
PEAK DISCHARGE 13.55 CFS

TIME (MIN) =	0	DISCHARGE (CFS) =	0
TIME (MIN) =	9	DISCHARGE (CFS) =	0
TIME (MIN) =	18	DISCHARGE (CFS) =	0.5
TIME (MIN) =	27	DISCHARGE (CFS) =	0.5
TIME (MIN) =	36	DISCHARGE (CFS) =	0.5
TIME (MIN) =	45	DISCHARGE (CFS) =	0.5
TIME (MIN) =	54	DISCHARGE (CFS) =	0.5
TIME (MIN) =	63	DISCHARGE (CFS) =	0.5
TIME (MIN) =	72	DISCHARGE (CFS) =	0.5
TIME (MIN) =	81	DISCHARGE (CFS) =	0.6
TIME (MIN) =	90	DISCHARGE (CFS) =	0.6
TIME (MIN) =	99	DISCHARGE (CFS) =	0.6
TIME (MIN) =	108	DISCHARGE (CFS) =	0.6
TIME (MIN) =	117	DISCHARGE (CFS) =	0.6
TIME (MIN) =	126	DISCHARGE (CFS) =	0.7
TIME (MIN) =	135	DISCHARGE (CFS) =	0.7
TIME (MIN) =	144	DISCHARGE (CFS) =	0.8
TIME (MIN) =	153	DISCHARGE (CFS) =	0.8
TIME (MIN) =	162	DISCHARGE (CFS) =	0.9
TIME (MIN) =	171	DISCHARGE (CFS) =	0.9
TIME (MIN) =	180	DISCHARGE (CFS) =	1
TIME (MIN) =	189	DISCHARGE (CFS) =	1.1
TIME (MIN) =	198	DISCHARGE (CFS) =	1.2
TIME (MIN) =	207	DISCHARGE (CFS) =	1
TIME (MIN) =	216	DISCHARGE (CFS) =	1.6
TIME (MIN) =	225	DISCHARGE (CFS) =	1.8
TIME (MIN) =	234	DISCHARGE (CFS) =	2.7
TIME (MIN) =	243	DISCHARGE (CFS) =	3.9
TIME (MIN) =	252	DISCHARGE (CFS) =	13.55
TIME (MIN) =	261	DISCHARGE (CFS) =	2.2
TIME (MIN) =	270	DISCHARGE (CFS) =	1
TIME (MIN) =	279	DISCHARGE (CFS) =	1.1
TIME (MIN) =	288	DISCHARGE (CFS) =	0.9
TIME (MIN) =	297	DISCHARGE (CFS) =	0.8
TIME (MIN) =	306	DISCHARGE (CFS) =	0.7
TIME (MIN) =	315	DISCHARGE (CFS) =	0.7
TIME (MIN) =	324	DISCHARGE (CFS) =	0.6
TIME (MIN) =	333	DISCHARGE (CFS) =	0.6
TIME (MIN) =	342	DISCHARGE (CFS) =	0.5
TIME (MIN) =	351	DISCHARGE (CFS) =	0.5
TIME (MIN) =	360	DISCHARGE (CFS) =	0.5
TIME (MIN) =	369	DISCHARGE (CFS) =	0

Note:
This hydrograph was generated using RatHydro, using input data that was determined via the preceding Rational Method Calculations. The hydrograph was input into Autodesk Hydraflow Hydrographs and was run through a modeled storage element with a raised overflow structure. See the following pages for the Hydraflow Hydrograph calculations for details on the storage and orifice flow analysis.

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

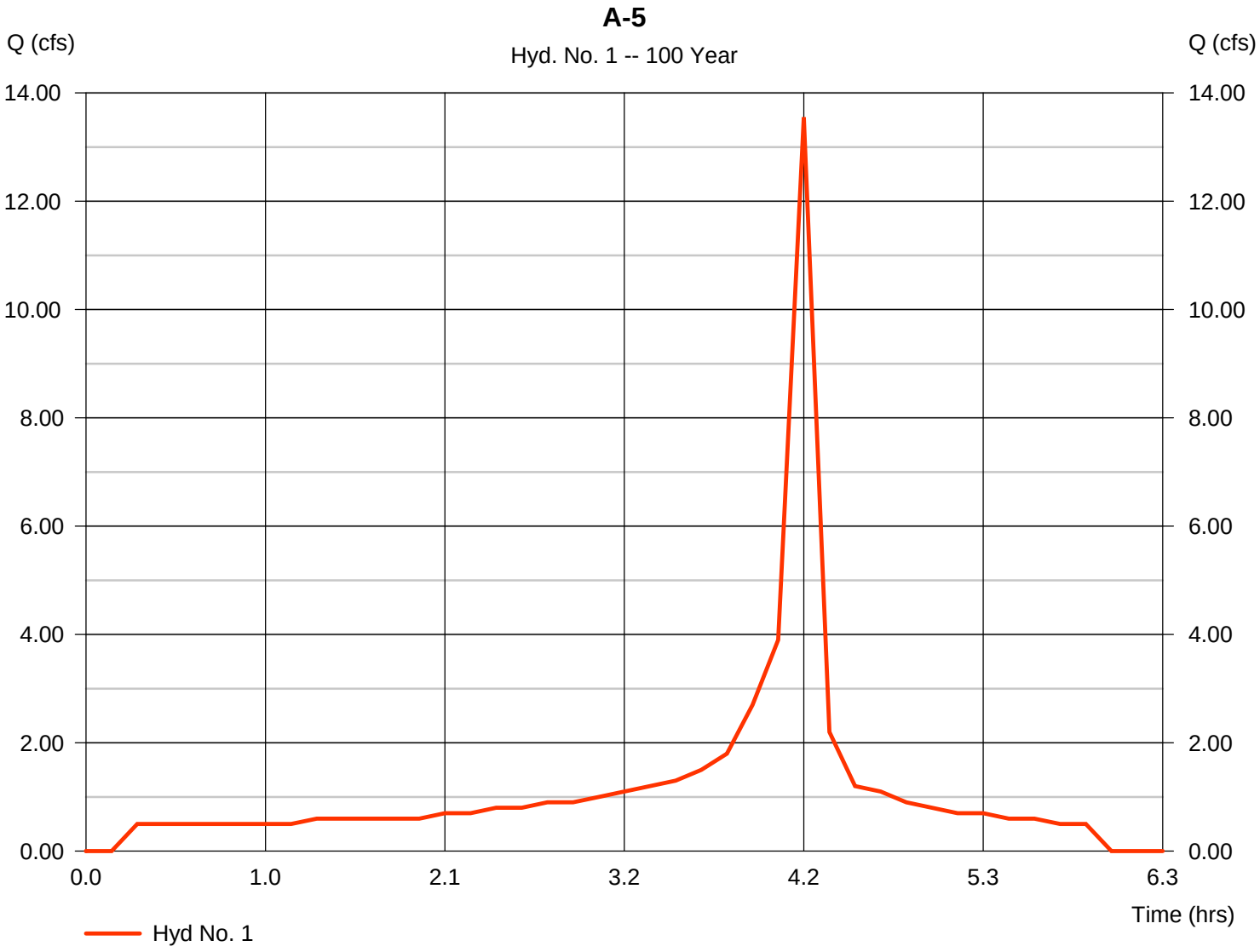


Hydrograph Report

Hyd. No. 1

A-5

Hydrograph type	= Manual	Peak discharge	= 13.55 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.20 hrs
Time interval	= 9 min	Hyd. volume	= 26,541 cuft



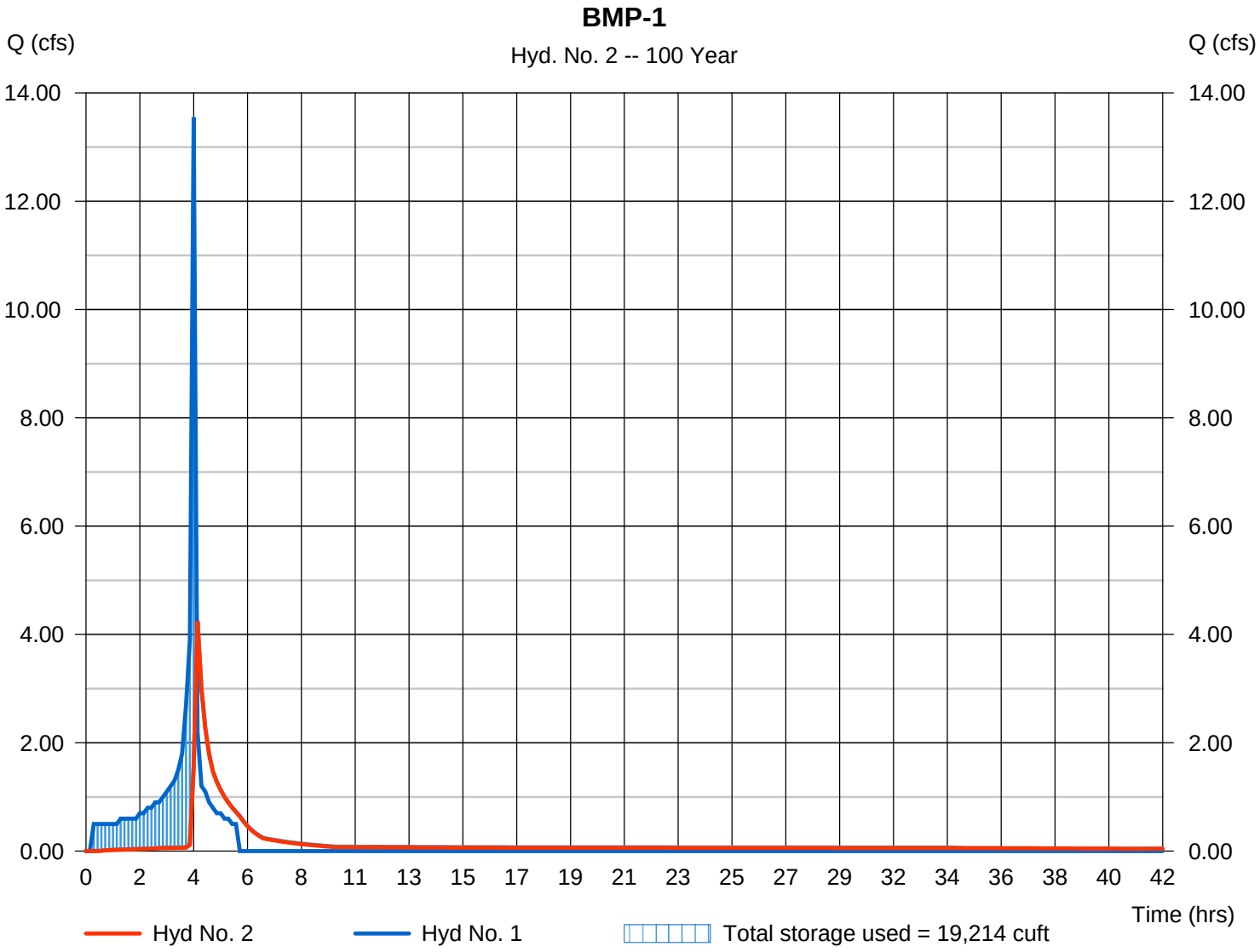
Hydrograph Report

Hyd. No. 2

BMP-1

Hydrograph type	=	Reservoir	Peak discharge	=	4.243 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.35 hrs
Time interval	=	9 min	Hyd. volume	=	24,202 cuft
Inflow hyd. No.	=	1 - A-5	Max. Elevation	=	107.19 ft
Reservoir name	=	BMP-1	Max. Storage	=	19,214 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - BMP-1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	4,400	0	0
0.01	100.01	1,760	30	30
2.50	102.50	1,760	4,382	4,412
2.51	102.51	880	13	4,425
4.00	104.00	880	1,311	5,736
4.01	104.01	4,400	24	5,760
7.50	107.50	4,400	15,354	21,114

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 1.00	0.00	0.00	0.00
Span (in)	= 1.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 100.25	0.00	0.00	0.00
Length (ft)	= 0.50	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.65	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

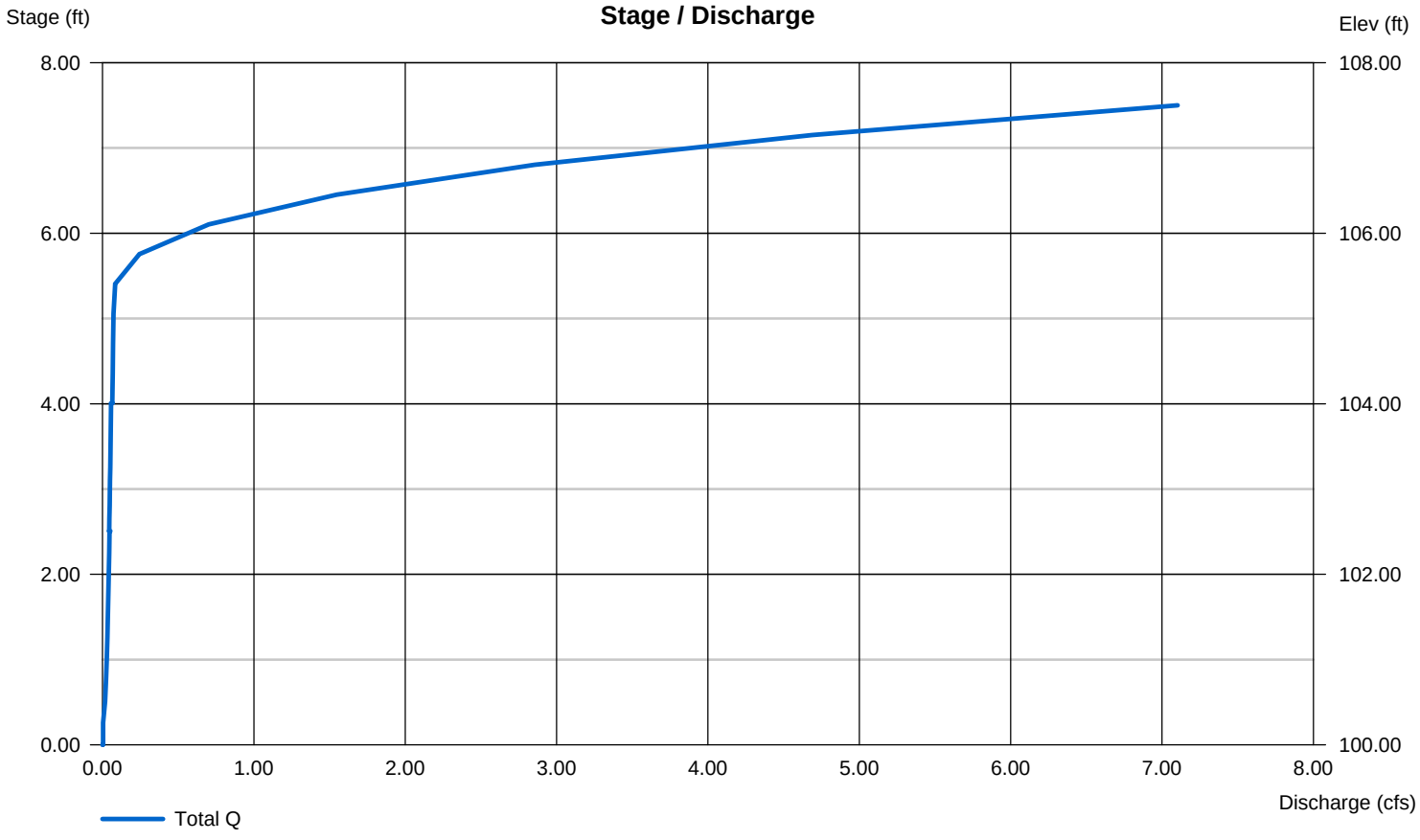
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 105.25	0.00	0.00	0.00
Weir Coeff.	= 0.92	3.33	3.33	3.33
Weir Type	= 40 degV	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.100 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Appendices

Appendix 1

County of San Diego Hydrology Manual

Soil Hydrologic Groups

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

PROJECT SITE
SOIL GROUP 'C'

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'

33°30' 33°15' 33°00' 32°45' 32°30'

Legend

Soil Groups

- Group A
- Group B
- Group C
- Group D
- Undetermined
- Data Unavailable

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Geographic Information Services

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N W E S

3 0 3 Miles

APPENDIX 1.0

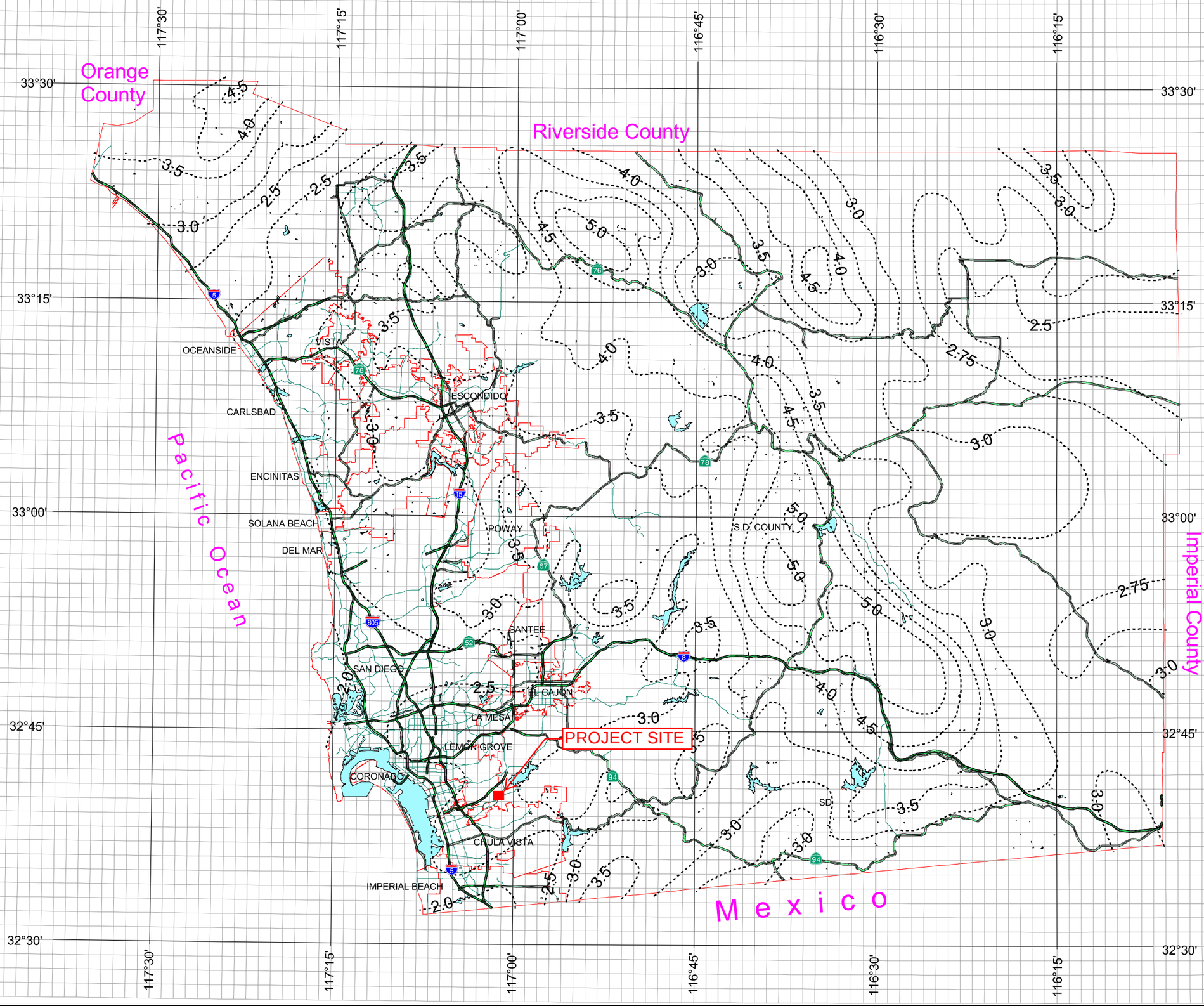
Appendix 2

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)



3 0 3 Miles

APPENDIX 2.0

Appendix 3

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

PROJECT SITE

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
POWAY
S.D. COUNTY
DEL MAR
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

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3 0 3 Miles

APPENDIX 3.0

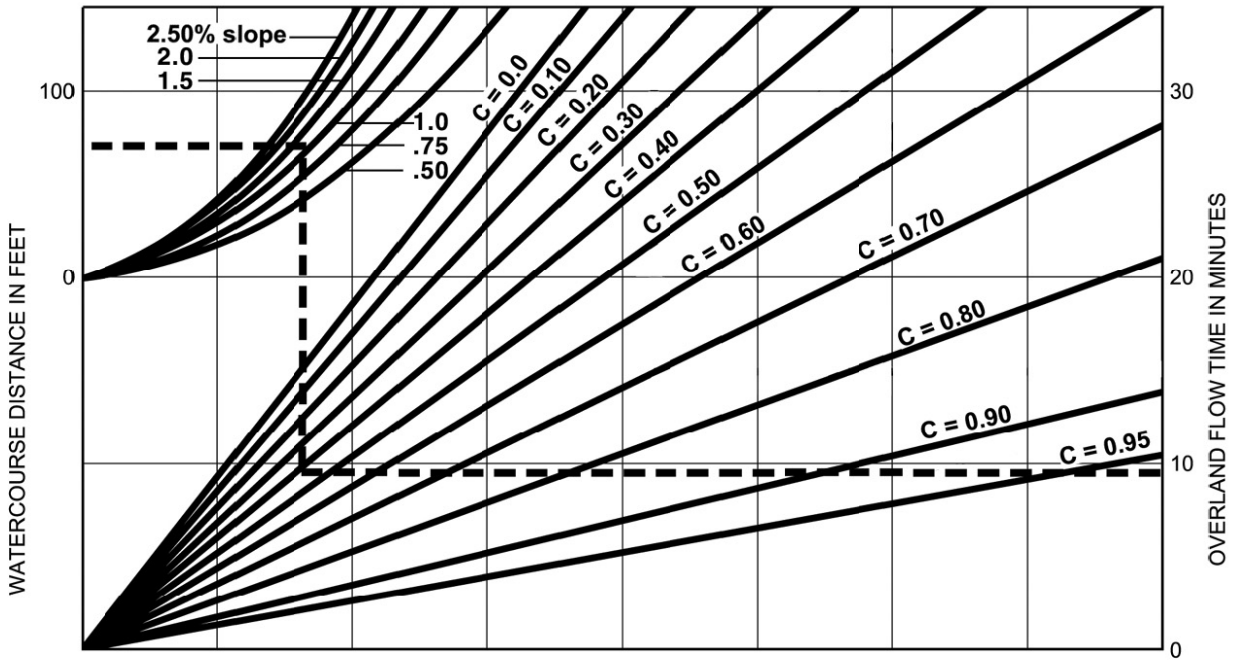
Appendix 4

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

Appendix 5



EXAMPLE:

Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Rational Formula - Overland Time of Flow Nomograph

FIGURE 3-3

Appendix 6

Appendix 7

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

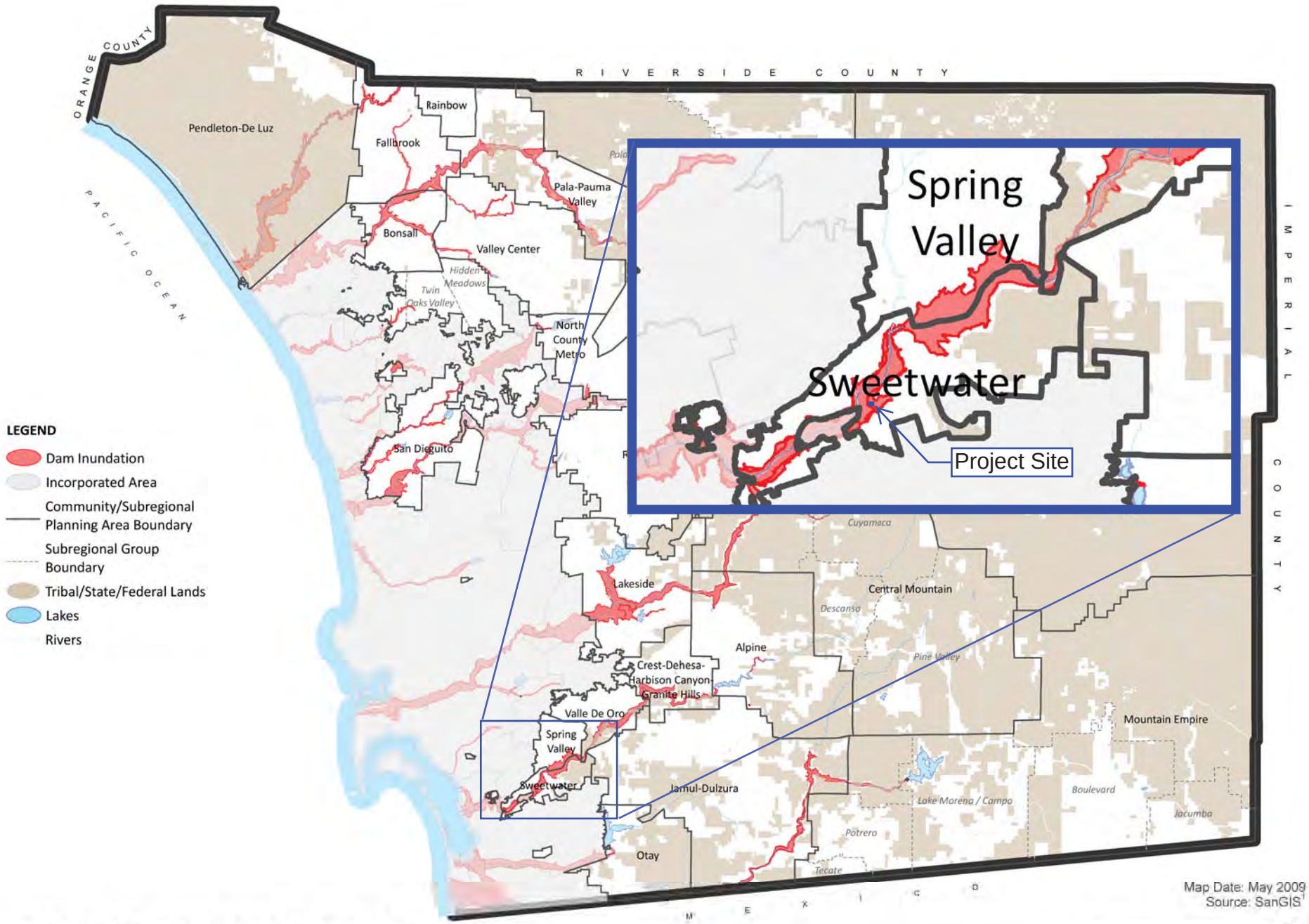
Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description

Appendix 8



DAM INUNDATION AREAS

San Diego County General Plan

Figure S-6

ATTACHMENT 7

Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 7.

If hardcopy or CD is not attached, the following information should be provided:

Title:
Prepared By:
Date:

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Diego County Area, California

Bonita Self Storage Site

July 6, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,150 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 9, Sep 17, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 7, 2014—Jan 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

San Diego County Area, California (CA638)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
SbA	Salinas clay loam, 0 to 2 percent slopes, warm MAAT, MLRA 19	4.0	100.0%
Totals for Area of Interest		**4.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Diego County Area, California

SbA—Salinas clay loam, 0 to 2 percent slopes, warm MAAT, MLRA 19

Map Unit Setting

National map unit symbol: 2tyy2
Elevation: 0 to 900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 330 to 360 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Salinas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Salinas

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from sedimentary rock

Typical profile

Ap - 0 to 7 inches: clay loam
A - 7 to 22 inches: clay loam
C1 - 22 to 32 inches: clay loam
C2 - 32 to 46 inches: clay loam
2Ck1 - 46 to 55 inches: clay loam
2Ck2 - 55 to 64 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C

Minor Components

Diablo
Percent of map unit: 3 percent

Huerhuero
Percent of map unit: 3 percent

Tujunga
Percent of map unit: 3 percent

Cropley
Percent of map unit: 2 percent

Garretson
Percent of map unit: 1 percent

Mocho
Percent of map unit: 1 percent

Sorrento
Percent of map unit: 1 percent

Pacheco
Percent of map unit: 1 percent