FUSCOE
ENGINEERING

STORM WATER QUALITY MANAGEMENT PLAN

NEWLAND SIERRA
TM-5597

February 2017

County of San Diego

prepared for:

Newland Sierra
9820 Town Centre Drive, Suite 100
San Diego, CA 92021
858.455.7503

prepared by:

Fuscoe Engineering, Inc.
6390 Greenwich Drive, Suite 170
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Project Manager: Eric K. Armstrong, P.E.
Job # 02660-002-02

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County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

NEWLAND SIERRA]
TM-5597

DEER SPRINGS ROAD
COUNTY OF SAN DIEGO, CA 92069

ASSESSOR'S PARCEL NUMBER(S):

172-091-07
172-220-14,-16, -18

174-190-12,-13,-20,-41,-43,-44
174-210-01,-05,-07,-08,-17,-18
174-211-04,-05,-06,-07
174-280-11,-14
174-290-02

178-100-05,-07,-26
178-101-01,-16,-17,-25-26,-27,-28
178-221-09
178-222-14,-16

182-040-36,-69
182-020-28,-29
186-250-13
186-611-01,-07,-08,-09,-11,-14,-15,-16,-17,-23
187-540-49,-50,-51

ENGINEER OF WORK:

2/24/17

Kenneth T. Kozlik, P.E., RCE #71883

PREPARED FOR:

NEWLAND SIERRA, LLC
9820 Town Center Drive, Suite 100
San Diego, CA 92021
858.455.7503

PDP SWQMP PREPARED BY:

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San Diego, CA 92122
858.554.1500

DATE OF SWQMP:
February 2017

PLANS PREPARED BY:
Kenneth T. Kozlik, P.E.
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858.554.1500

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: Newland Sierra
Permit Application Number: TM-5597

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.

C71883, Exp 12/31/17
Engineer of Work's Signature, PE Number & Expiration Date

Kenneth T. Kozlik, P.E.
Print Name

Fuscoe Engineering, Inc.
Company

2/21/17
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	January 2015	Initial Submittal
2	January 2016	Response to County Comments
3	August 2016	New SWQMP Template and Response to County Comments
4	November 2016 . February 2017	Response to County Comments . Response to County Comments

Final Design

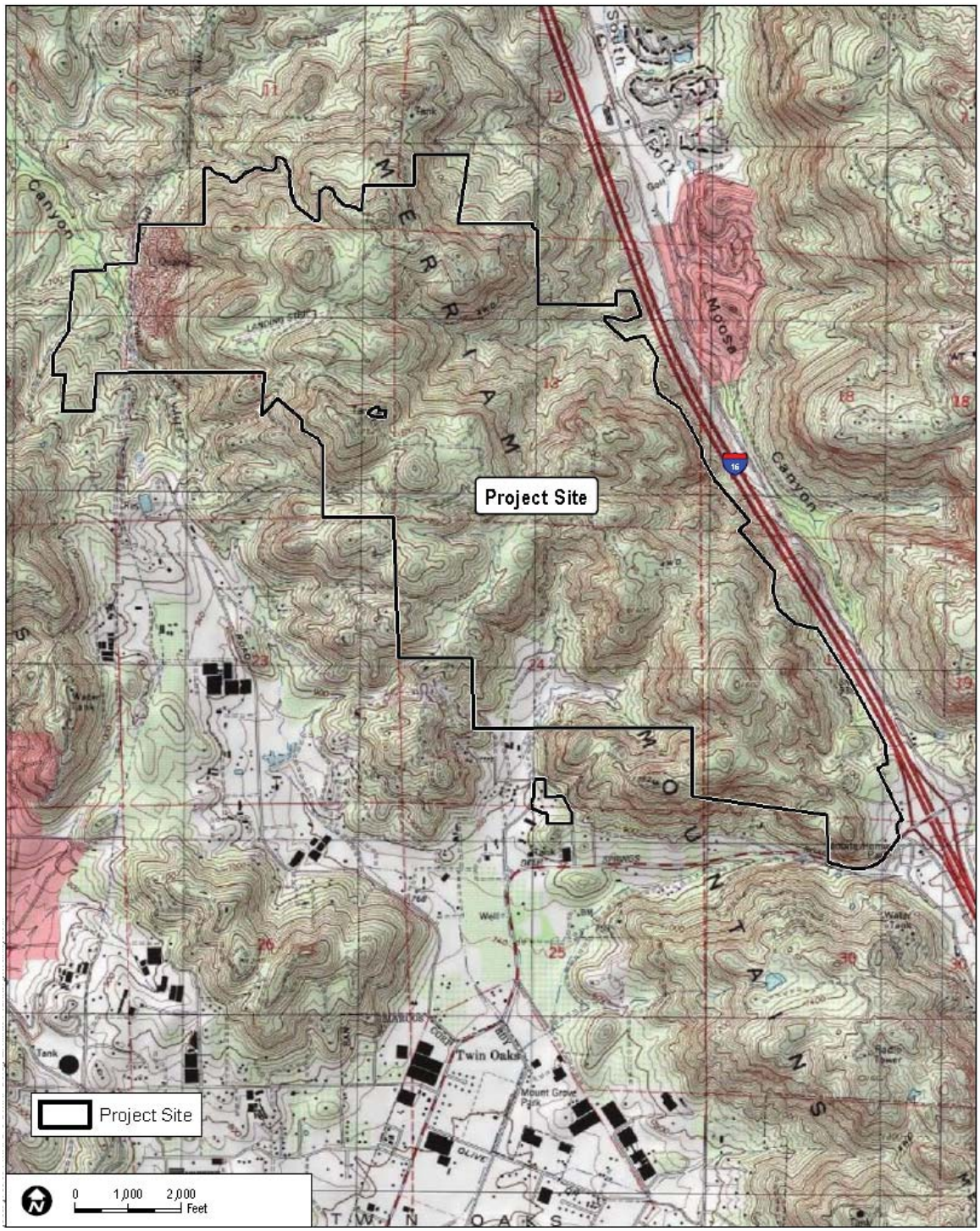
Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Plan Changes

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

Project Vicinity Map

Project Name: Newland Sierra
Record ID: TM-5597



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: 250 Acres, 10,875,787 ft^2			
The total existing (pre-project) impervious area is: 4,350 ft^2			
The total area disturbed by the project is: 783 Acres, 34,107,480 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: _TO BE DETERMINED__			
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:	If so:
☐ 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;	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	☒	
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	☒	
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	☒	
D. Select sediment control method for all disturbed areas (choose at least one)			
Silt Fence	SC-1	☒	
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	☒	
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	☒	
Spill Prevention and Control	WM-4	☒	
F.2 Waste Management[10]			
Waste Management Concrete Waste Management	WM-8	☒	
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)	San Luis Rey HU -Moosa Hydrologic Sub-Area 903.13 -Bonsall Hydrologic Sub-Area 903.12 Carlsbad HU -Twin Oaks Hydrologic Sub-Area 904.53

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:

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

- ☒ Vegetative Cover 1924.9 Acres (83,848,644 Square Feet)
- ☒ Non-Vegetated Pervious Areas 60 Acres (2,613,600 Square Feet)
- ☒ Impervious Areas 0.1 Acres (4,350 Square Feet)

Description / Additional Information:

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):

- ☐ 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:

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:
The project site consists of natural hills and valleys totaling 1,985 acres. From a drainage perspective, the site straddles the divide between three major watersheds. These are the South Fork Moosa Canyon, San Marcos Creek and South Fork Gopher Canyon watersheds. These three major watersheds total 3152 acres of land, including areas outside the project boundary. The project specific drainage study addresses the area of the total watershed. Existing storm drain systems and design flows for Highway I-15, Deer Springs Road, and Twin Oaks Valley Road were obtained from as-built drawings, from maps at Caltrans and the County. Impacts on existing watercourses and existing structures are discussed in depth in the Drainage Study.

South Fork Moosa Canyon,
The South Fork Moosa Canyon watershed is designated Basin A, and drains to the East toward Highway I-15. This watershed consists of 879 acres within the project boundary and a total of 1,265 acres for the entire South Fork Moosa Canyon. Under existing conditions, flow is conveyed to the east through natural valleys and channels to Highway I-15. Project subbasins discharge under Highway I-15 through multiple culverts and storm drain systems. Under existing conditions, Basin A conveys a calculated maximum runoff rate (Q) of 983 cfs toward the east.

San Marcos Creek
The portion of the analysis area draining to San Marcos Creek is divided into two project basins, Basin B and Basin C. Runoff from Basins B and C flows south to Deer Springs Road, where it is conveyed under the roadway through multiple culverts and channels. This watershed consists of 696 acres within the project boundary and total of 1170 acres for the San Marcos Creek watershed. The maximum runoff rate (Q) for existing conditions is 1528 cfs draining to the southwest into San Marcos Creek.

South Fork Gopher Canyon
The portion of the analysis area draining to South Fork Gopher Canyon is also divided into two basins, Basin D and Basin E. Runoff from Basins D and E flows northwest toward Twin Oaks Valley Road. This watershed consists of 340 acres within the project boundary and a total of 713 acres within the area of analysis. The maximum runoff rate (Q) for existing conditions for this area is 1092 cfs.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:

The proposed project is for The Newland Sierra in the county of San Diego, California. The project site is located near the intersection of Highway I-15 and Highway 78. It is bordered on the north near Gopher Canyon Road, to the west near Twin Oaks Valley Road, to the south near Deer Springs Road and to the east by Highway I-15. Refer to Figure 1: Vicinity Map for project location.

The proposed development will include residential component consisting of 2,135 dwelling units which equates to an overall density of 1.08 dwelling units per acre (du/ac) over the entire 1,985 acres. The Town Center also permits 81,000 square feet of general commercial uses as well as civic and park uses. The community also includes an active park system with public and private parks, public trails and a school site.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

The proposed development will include multiple neighborhoods, access roads, circulation roads, parking areas, plazas, sidewalks, and utilities for a master planned community.

List/describe proposed pervious features of the project (e.g., landscape areas):

The proposed development will include multiple parks, vegetated swale/bio filters, and a significant amount of natural open space.

Does the project include grading and changes to site topography?

☒Yes

☐No

Description / Additional Information:

.

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	1,924.9	1,734.4	-9.9%
Pervious (non-vegetated)	60	0	-100%
Impervious	0.1	249.6	2,496%

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 drainage management strategy for Newland Sierra utilizes multifunction BMPs to provide water quality treatment, hydromodification mitigation, and peak detention for the developed portions of the site. Points of Compliance (POCs) have been identified where the proposed storm drain system will discharge to the surrounding natural drainage courses. If the project proposes to increase un-mitigated post-development flows to a POC, a storm water management Best Management Practice (BMP) was then designed to mitigate the impacts of the increase. The BMPs then discharge to the natural drainage courses. Where a BMP discharges to a natural drainage course, appropriately sized energy dissipation will be provided. Energy dissipation facilities will be sized at the time of final engineering.

To preserve the flow patterns of undisturbed areas upstream of developed areas, and to minimize required BMP sizes, a dual-pipe storm drain system will be utilized. A “clean” storm drain system will convey runoff from undisturbed areas and landscaped slopes, which are considered “self-mitigating”, as well as collect the treated discharge from the proposed BMPs. A separate “dirty” storm drain system will direct runoff from developed areas of the site to BMPs for treatment. Where possible, runoff from developed areas will be directed to BMPs via surface flow, but in larger Drainage Management Areas (DMAs) an underground “dirty” storm drain system will be required.

The BMP selected for the project is the biofiltration. Biofiltration basins are preferred for their combination of a medium-to-high level of treatment for all pollutants and for their ability to provide hydromodification mitigation. Biofiltration basins are also a Low Impact Development (LID) feature, using natural processes to provide stormwater treatment and flow attenuation. Biofiltration is the primary treatment, which is encouraged by R9-2013-001 and has been selected to assist the project in compliance with the forthcoming BMP Design Manual.

The proposed biofiltration basins will be distributed throughout the site to provide water quality treatment and hydromodification mitigation near the source of runoff, consistent with a Low Impact Development approach to storm water management. The biofiltration basins have been integrated into the site design of the project where possible, or have been tucked into unobtrusive locations to minimize visual and grading impacts. The proposed road network will incorporate a series of roadside swales and trails in many of the main circulation roads and loop roads within the neighborhoods. In some neighborhoods where the street slope is shallow enough, biofiltration basins will be incorporated into the roadside swales. To provide ponding within the roadside biofiltration basins, check dams and driveway crossings will be utilized to take up grade allowing for a flat-bottomed area for biofiltration. The subdrain pipes for the roadside biofiltration basins

will be linked, with a flow-control orifice placed on the end of the subdrain pipe where it enters a downstream catch basin or clean out.

The BMPs have been designed in accordance with the February 2016 County of San Diego BMP Design Manual. The proposed BMPs combine aspects of Biofiltration Areas, Biofiltration Swales, and Biofiltration Basins as described in Appendix B-5 and Appendix E of the Design Manual.

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 Newland Sierra project is nestled along a mountain range. As such, the site is split into several major drainage basins as creeks and tributaries originate at the high points of the range and course down the slopes. The Preliminary flow path for Newland Sierra divides the project into five major drainage basins, which are tributary to three different watersheds. The watersheds include the South Fork of Moosa Canyon, San Marcos Creek, and the South Fork of Gopher Canyon.

Under developed conditions, the existing basin boundaries will be modified where there is development along the dividing line between basins. However, the grading and drainage system has been carefully designed to preserve the overall drainage patterns and the total area draining to each major basin. This will minimize impacts to the receiving watersheds by ensuring there is no net diversion between the watersheds

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
San Luis Rey River 903.12	*Chloride Enterococcus, Fecal Coliform, Phosphorus, Total Dissolved Solids, Total Nitrogen as N, Toxicity*	*Bacteria*
Pacific Ocean Shoreline at San Luis Rey River Mouth	*Indicator Bacteria*	
San Marcos Creek 904.53	*DDE, Phosphorus, Sediment, Toxicity, Selenium*	*Nutrients*
San Marcos Lake 904.52	*Ammonia as Nitrogen, Nutrients*	*Nutrients*

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	☐	☒	☒

[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

Nutrients	☐	☒	☒
Heavy Metals	☐	☒	☐
Organic Compounds	☐	☒	☐
Trash & Debris	☐	☒	☐
Oxygen Demanding Substances	☐	☒	☐
Oil & Grease	☐	☒	☐
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):

[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.

Due to the large number of POCs for the project and the fact that many of the receiving channels display similar characteristics, not all of the POCs were analyzed in the *Hydromodification Screening for Newland Sierra* by Chang Consultants. A full channel assessment was performed on a representative sample of 10 POC's between the 2015 and 2016 studies. These POCs and their associated receiving channels were chosen for analysis due to either their similarity to other channels which would likely have similar results from a channel assessment, or their unique characteristics which warranted a unique study. The table below lists the POCs which were analyzed, the major basin in which they are located, their dominant characteristics, and the erosion susceptibility determined in the *Hydromodification Screening for Newland Sierra*, and the resulting low-flow threshold. The POCs that were studied were chosen as representative of the POCs on site. The POCs that were not studied all have similar geologic, topographic, and hydrologic characteristics to some of the representative POCs studied. Additionally, POCs have been studied in the drainage basins that are the largest and most impacted by development. It is reasonable to extrapolate these results to the remaining POCs onsite. A geomorphic assessment will be performed at all remaining POCs during final engineering.

POC	Major Basin	Characteristics	Erosion Susceptibility	Low-Flow Threshold
1064	A	Steep hillside drainage leading into major canyon which accepts runoff from several other POCs in Major Basin A. Representative POC for steep hillside canyons draining to the east.	Low	$0.5Q_2$
1304	A	Steep hillside drainage leading into canyon drains to Interstate 15. Representative POC for steep hillside canyons draining to the east.	Low	$0.5Q_2$
1329	A	Steep hillside drainage leading into canyon drains to Interstate 15. Representative POC for steep hillside canyons draining to the east.	Low	$0.5Q_2$
1905	A	Steep hillside drainage leading into canyon drains to Interstate 15. Representative POC for steep hillside canyons draining to the east.	Low	$0.5Q_2$
2100	B	Deer Springs Creek, which accepts runoff from a portion of the Town Center and Deer Springs Road. Unique POC.	Medium	$0.3Q_2$
2101	B	Minor drainage in an area of moderate slopes. Unique POC.	Medium	$0.3Q_2$
2380	B	Stevenson Creek, which accepts runoff from a large portion of the central area of the project. Unique POC.	Low	$0.5Q_2$
245	C	Steep canyon draining to the northern end of Twin Oaks Valley Creek. Representative POC for steep hillside canyons draining to the west.	Low	$0.5Q_2$
2786	C	Steep canyon draining to the northern end of Twin Oaks Valley Creek. Representative POC for steep hillside canyons draining to the west.	Low	$0.5Q_2$
2810	D	Canyon along North Twin Oaks Valley Road that drains north to Gopher Canyon. Unique POC.	Medium	$0.3Q_2$

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:
Hydromodification Screening for Newland Sierra, January 14, 2015, Chang Consultants
Hydromodification Screening for Newland Sierra, July 8, 2015, Chang Consultants

Discussion / Additional Information: (optional)
Additional information regarding CCSYAs and Hydromodification is found in Attachment 2c of this document.

Since none of the POCs along Deer Springs Road were studied, a low flow threshold of 0.3Q2 was used for the sizing of offsite hydromodification BMPs. This is a conservative assumption for the following reasons:

- The upper portion of Deer Springs Creek was assessed and assigned a low flow threshold of 0.3Q2.
- The upper portion of Stevensons Creek was assessed and assigned a low flow threshold of 0.5Q2.
- The segment of Stevensons Creek which parallels Deer Springs Road will be modified with a new engineered channel, which will be designed to have a low susceptibility to erosion.

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.

Zoning within the project consists of a mix of the following uses (in order of area within site, largest to smallest): General Rural, Rural Residential, Extractive, Limited Agricultural, Office Professional, and Parking. The project proposes with a General Plan Amendment and a Specific Plan Amendment to amend the zoning to the following uses: Open Space, Residential Urban, General Commercial/Residential and Agricultural.

The project site is located within the San Marcos quadrangle map. Based on the US Department of Agriculture's Soil Survey of San Diego County (1973), the majority of the site is comprised of three types of soil – Acid igneous rock land (AcG), Cieneba rocky coarse sandy loam, 9-30% slopes, eroded (CmE2), and Cieneba very rocky coarse sandy loam, 30 to 75% slopes (CmrG). Most of the development will also occur within these soil types.

A small portion of development will occur within nine additional soil types – Cieneba –Fallbrook rocky sandy loams, 9 to 30% slopes, eroded (CnE2), Fallbrook sandy loam, 9 to 15% slopes, eroded (FaD2), Las Posas fine sandy loam, 9 to 15% slopes, eroded (LpD2), Las Posas fine sandy loam 9 to 15% slopes, eroded (LpE2), Placentia sandy loam, 2 to 9% slopes (PeC), Placentia sandy loam, 5 to 9% slopes, eroded (PeC2), Ramona sandy loam, 5 to 9% slopes, eroded (RaC2), Visalia sandy loam, 2 to 5% slopes (VaB), and Wyman loam, 5 to 9% slopes (WmC). AcG, CmE2, and CmrG soils have significant areas of rock outcrops and large boulders. AcG is approximately 50 to 90% covered, CmE2 is approximately 30% covered, and CmrG is approximately 50% covered. Soil cover over the granodiorite base is generally shallow, only 5 to 15 inches deep. Runoff is rapid to very rapid, with only about 1 inch to 1.5 inches of available water holding capacity. These soils are a high erosion hazard. The remaining eight soil types range in characteristics from slight to high erosion hazards.

The majority of development occurs within areas of rapid runoff and high erosion hazard. As a result, erosion control during and after construction must be emphasized. Runoff from the development will be contained within streets and conveyed through the on-site storm drain system to four extended detention basins where required. Outlets for the detention basins will be designed with riprap to decrease the discharge velocity to limit erosion. Runoff from impervious areas, which tends to be rapid and may cause erosion, will not be allowed to drain directly beyond the limits of development. It will be contained and subsequently detained within the detention basins.

Based on the USDA soil survey, Cieneba soils have severe limitations for retention structures due to their rapid permeability. This permeability may also cause a potential for groundwater contamination around the detention basins. The soils will be analyzed prior to construction of the basins and an impermeable liner will be used to protect groundwater if necessary.

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.

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:			
4.2.2 Storm Drain Stenciling or Signage	☒Yes	☐ No	☐ N/A
Discussion / justification if 4.2.2 not implemented:			
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:			
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:			

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:			
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.			

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:			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐ No	☐ N/A
Discussion / justification if 4.3.2 not implemented:			
4.3.3 Minimize Impervious Area	☒Yes	☐ No	☐ N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☒Yes	☐ No	☐ N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☒Yes	☐ No	☐ N/A
Discussion / justification if 4.3.5 not implemented:			

Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☒Yes	☐ No	☐ N/A
Discussion / justification if 4.3.6 not implemented:			
4.3.7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvesting and Using Precipitation	☐Yes	☒No	☐ N/A
Discussion / justification if 4.3.8 not implemented: Harvesting and Using Precipitation is infeasible to the project. (See Sheet 1 of Attachment 1a)			

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.
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 form 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 (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

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.

The project site is evaluated at DMA scale with the exception of Harvest and Use Feasibility. Harvest and use feasibility for the proposed development with 2,135 units at an average of 3 residents per unit is considered to be infeasible. (See Harvest and Use Feasibility, Attachment 1c) Infiltration is also infeasible over the majority of the project site due to shallow bedrock and slope stability concerns.

Each DMA not “Self-mitigating” or “De minimis” or “Self-retaining” is associated with its perspective runoff factors to estimate BMPs and DCVs. All BMP are compliant with pollutant control BMP sizing requirements.

(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)

For hydromodification management, a variety of methods where used to size the BMPs. In hydrology Basin 25 (POC 2380), a SWMM model was prepared by REC Consultants. This SWMM model was necessary for the Critical Coarse Sediment Yield Area No Net Impact calculation.

For the majority of the remainder of the project site, the BMP Sizing Spreadsheet was used to size the hydromodification BMPs. The BMP Sizing Spreadsheet was chosen due to the preliminary nature of the study. Due to the preliminary nature of the study, three simplifications were made to support use of the BMP Sizing Spreadsheet. Firstly, the use of Type B soil for BMP Type Flow-Through Planter is restricted in the BMP sizing calculations but allowed in the orifice sizing calculation. Thus the conservative option of Type C soil has been used for the BMP sizing, while type B soil was used for the orifice sizing.

Secondly, the bioretention calculation in the BMP Sizing Spreadsheet allows the use of a subdrain in Type A and B soils, which makes the BMPs more akin to Partial Retention BMPs from a Pollutant Control standpoint. Some of the offsite BMPs along Deer Springs Road and Twin Oaks Valley Road, which are underlain by Type A or B soils, were thus sized as bioretention with a subdrain in the BMP Sizing Spreadsheet, and as Partial Retention in the Pollutant Control calculations.

Thirdly, one of the simplifications that the BMP Sizing Spreadsheet makes is that it assumes the drainage area to the POC is equal in the existing and proposed conditions. This is not always the case for the project due to the grading required. To ensure that the BMPs designed with the BMP Sizing Spreadsheet will adequately mitigate for hydromodification, the existing and proposed drainage area to each POC was calculated. This information has been tabulated on sheets 12 and 13 of the DMA Exhibits, and the drainage boundaries are shown on these sheets as well. Several POCs exhibit increases in drainage area. The largest increase in drainage area is POC 1341, which exhibits a 117% increase in drainage area in proposed conditions. To ensure that the BMP draining to POC 1341 (BMP H14A) will be adequate to mitigate for this increase in drainage area, a continuous simulation model was prepared for this POC using SDHM. The SDHM model was able to demonstrate compliance at POC 1341 without increasing the footprint of BMP H14A. This was done by increasing the surface ponding and subsurface gravel layer in the BMP. Since it has been demonstrated that POC 1341, which exhibits the most increase in drainage area, can be brought into compliance using a continuous simulation model without increasing the BMP footprint, the BMPs for remaining POCs with an increase in drainage area will be adequate. Continuous simulation modeling will be performed in final engineering for all BMPs draining to POCs with an increase in drainage area.

POCs were also identified where self-mitigating DMAs and bypass flows are discharged through a storm drain or lined ditch. The existing and proposed drainage areas where compared, as shown on sheets 12 and 13 of the DMA Exhibits. In all cases, any increase in drainage area has been limited to below 10%, which is in compliance with hydromodification 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. CM10,H1,H2,H3A,H3B,H4,H5,H6,H7,H10,H11,H12,H13,H14A,H14B, H15,K2,K3,K4,K5,K6,K7K9,K8,M2,M3A,M3B,M4,M8,S1,S2,S3,S4,S5,S6,S7,S8,S9,T3,T4,T5,T6 , T7,TC1,TC3,TC4,TC5,V1,V2,V3,V4,V5,V6,V7,V8,V9,V10,V13,V14,V15,V16,V17, SL8, SL9	
Construction Plan Sheet No.	
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)	Kenneth T. Kozlik, PE Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92122
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.	2 – HOA Maintained **Maint. Agreement to be provided in final eng. ***Public/County Maintained BMPs are to be Category 2 until CFD has been established

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. CM1,CM2,CM3,CM4,CM5,H8HR1,H9HR2,KR1,K10,M1MR1K1,S10, TR1T1T2,TR2,TC2TCR1,TCR2,TCR3,V11VR2,V12VR1,D1,D2,D3,D4,D6,D7,D8,D9,D10,D11, D12,D13,D14,D15,D16,D17,D18,D19,D20A,D20B,D21,D22,D23,D24,D25A,D25W,SL1,SL2,SL3,SL4	
Construction Plan Sheet No.	
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)	Kenneth T. Kozlik, PE Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92122
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.	3 – County Maintained **Maintenance Agreement to be provided in final engineering ***Public/County Maintained BMPs are to be Category 2 (HOA Maintained) until CFD has been established.

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

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 1a

Storm Water Pollutant Control Worksheet Calculations

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

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	622,411	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	6,063	#
	3	Total Planted Area within Development	75,550,464	sq-ft
	4	Water Use Category for Proposed Planted Areas	Moderate	unitless
Infiltration Inputs	5	Is Average Site Infiltration Rate Less than 0.5 Inches per Hour?	Yes	yes/no
	6	Is Retention of the Full DCV Anticipated to Produce Negative Impacts?	Yes	yes/no
	7	Is Retention of Any Volume Anticipated to Produce Negative Impacts?	Yes	yes/no
Calculations	8	36-Hour Toilet Use Per Resident or Employee	0.37	cubic-feet
	9	Subtotal: Anticipated 36 Hour Toilet Use	2,268	cubic-feet
	10	Anticipated 1 Acre Landscape Use Over 36 Hours	196.52	cubic-feet
	11	Subtotal: Anticipated Landscape Use Over 36 Hours	340,851	cubic-feet
	12	Total Anticipated Use Over 36 Hours	343,119	cubic-feet
	13	Total Anticipated Use / Design Capture Volume	0.55	cubic-feet
	14	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	15	Is Full Retention Feasible for this Project?	No	yes/no
	16	Is Partial Retention Feasible for this Project?	No	yes/no
Result	17	Feasibility Category	5	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

A. Applicants may use this optional worksheet to gauge the feasibility of implementing capture and use techniques on their project site. 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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	CM1	CM2	CM3	CM4	CM5	CM10					unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration					unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65					inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	41,849	13,822	27,564	79,605	18,016	2,660					sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	4,650	1,536	3,063	8,845	2,002	296					sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	46,499	15,358	30,627	88,450	20,018	2,956	0	0	0	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.84	0.84	0.84	0.84	0.84	0.84	0.00	0.00	0.00	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.84	0.84	0.84	0.84	0.84	0.84	n/a	n/a	n/a	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	39,059	12,901	25,727	74,298	16,815	2,483	0	0	0	0	sq-ft
	31	Initial Design Capture Volume	2,116	699	1,394	4,024	911	134	0	0	0	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	2,116	699	1,394	4,024	911	134	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	CM1	CM2	CM3	CM4	CM5	CM10	-	-	-	-	unitless
	1	Effective Tributary Area	39,059	12,901	25,727	74,298	16,815	2,483	-	-	-	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	-	-	-	-	ratio
	3	Design Capture Volume Tributary to BMP	2,116	699	1,394	4,024	911	134	-	-	-	-	cubic-feet
	4	Provided Biofiltration Surface Area	2,100	695	1,365	4,900	1,000	200					sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	10					inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18					inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18					inches
	8	Hydromodification Orifice Diameter of Underdrain	2.00	1.00	1.00	2.40	1.00	0.50					inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.203	0.051	0.051	0.292	0.051	0.013	n/a	n/a	n/a	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	4.18	3.18	1.62	2.58	2.21	2.77	n/a	n/a	n/a	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	4.18	3.18	1.62	2.58	2.21	2.77	5.00	5.00	5.00	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	25.11	19.07	9.71	15.46	13.25	16.61	0.00	0.00	0.00	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	22.6	22.6	22.6	22.6	22.6	22.6	0	0	0	0	inches
	17	Drawdown Time for Surface Ponding	2	3	6	4	5	4	0	0	0	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	5	7	14	9	10	8	0	0	0	0	hours
	19	Total Depth Biofiltered	47.71	41.67	32.31	38.06	35.85	39.21	0.00	0.00	0.00	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	3,174	1,049	2,091	6,036	1,367	201	0	0	0	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	3,174	1,049	2,091	6,036	1,367	201	0	0	0	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	1,587	524	1,046	3,018	683	101	0	0	0	0	cubic-feet
	23	Option 2 - Provided Storage Volume	1,587	524	1,046	3,018	683	101	0	0	0	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**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 Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	CM1	CM2	CM3	CM4	CM5	CM10	-	-	-	-	unitless
	Total Area Tributary to BMP	46,499	15,358	30,627	88,450	20,018	2,956	-	-	-	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.84	0.84	0.84	0.84	0.84	0.84	-	-	-	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	-	-	-	-	inches
	Initial Design Capture Volume	2,116	699	1,394	4,024	911	134	-	-	-	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.84	0.84	0.84	0.84	0.84	0.84	-	-	-	-	unitless
	Final Effective Tributary Area	39,059	12,901	25,727	74,298	16,815	2,483	-	-	-	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	-	-	-	-	cubic-feet
	Design Capture Volume Tributary to BMP	2,116	699	1,394	4,024	911	134	-	-	-	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	-	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	-	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	D1	D2	D3	D4	D5/NA	D6	D7	D8	D9	D10	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration		Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65		0.65	0.65	0.65	0.65	0.65	inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	241,979	59,220	131,138	79,603		31,600	17,258	15,146	142,880	8,444	sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)									15,876	938	sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	26,887	6,580	14,571	8,845		3,511	1,918	1,683			sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	268,866	65,800	145,709	88,448	0	35,111	19,176	16,829	158,756	9,382	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.83	0.83	0.83	0.83	0.00	0.83	0.83	0.83	0.82	0.82	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.83	0.83	0.83	0.83	n/a	0.83	0.83	0.83	0.82	0.82	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	223,159	54,614	120,938	73,412	0	29,142	15,916	13,968	130,180	7,693	sq-ft
	31	Initial Design Capture Volume	12,088	2,958	6,551	3,976	0	1,579	862	757	7,051	417	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	12,088	2,958	6,551	3,976	0	1,579	862	757	7,051	417	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	D11	D12	D13	D14	D15	D16	D17	D18	D20A	D20B	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	8,135	14,231	24,851	26,451	8,874	8,099	10,538	14,192	57,543	57,543	sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)	904	1,581	2,761	2,939	986	900	1,171	1,577	6,394	6,394	sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	9,039	15,812	27,612	29,390	9,860	8,999	11,709	15,769	63,937	63,937	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	7,412	12,966	22,642	24,100	8,085	7,379	9,601	12,931	52,428	52,428	sq-ft
	31	Initial Design Capture Volume	401	702	1,226	1,305	438	400	520	700	2,840	2,840	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	401	702	1,226	1,305	438	400	520	700	2,840	2,840	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	D21	D22	D23	D24	D25W	D25E					unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration					unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65					inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	21,614	29,654	16,067	59,901	147,954	111,928					sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)	2,402	3,295	1,785								sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)				6,656	16,439	12,436					sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	24,016	32,949	17,852	66,557	164,393	124,364	0	0	0	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.82	0.82	0.82	0.83	0.83	0.83	0.00	0.00	0.00	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.82	0.82	0.82	0.83	0.83	0.83	n/a	n/a	n/a	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	19,693	27,018	14,639	55,242	136,446	103,222	0	0	0	0	sq-ft
	31	Initial Design Capture Volume	1,067	1,463	793	2,992	7,391	5,591	0	0	0	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	1,067	1,463	793	2,992	7,391	5,591	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	D1	D2	D3	D4	-	D6	D7	D8	D9	D10	unitless
	1	Effective Tributary Area	223,159	54,614	120,938	73,412	-	29,142	15,916	13,968	130,180	7,693	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	-	0.030	0.030	0.030	0.030	0.030	ratio
	3	Design Capture Volume Tributary to BMP	12,088	2,958	6,551	3,976	-	1,579	862	757	7,051	417	cubic-feet
	4	Provided Biofiltration Surface Area	9,780	2,750	6,000	3,660		900	790	700	10,200	430	sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10		10	10	10	10	10	inches
	6	Provided Soil Media Thickness	18	18	18	18		18	18	18	18	18	inches
	7	Provided Gravel Storage Thickness	48	48	48	48		78	48	48	18	18	inches
	8	Hydromodification Orifice Diameter of Underdrain	3.00	1.40	2.00	1.50		0.80	1.00	1.00	2.50	0.50	inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.589	0.129	0.263	0.148	n/a	0.050	0.066	0.066	0.317	0.013	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	2.60	2.03	1.89	1.75	n/a	2.39	3.60	4.07	1.34	1.29	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	2.60	2.03	1.89	1.75	5.00	2.39	3.60	4.07	1.34	1.29	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	15.61	12.15	11.35	10.48	0.00	14.36	21.61	24.39	8.05	7.73	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	34.6	34.6	34.6	34.6	0	46.6	34.6	34.6	22.6	22.6	inches
	17	Drawdown Time for Surface Ponding	4	5	5	6	0	4	3	2	7	8	hours
	18	Drawdown Time for Entire Biofiltration Basin	13	17	18	20	0	19	10	9	17	18	hours
	19	Total Depth Biofiltered	50.21	46.75	45.95	45.08	0.00	60.96	56.21	58.99	30.65	30.33	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	18,132	4,437	9,827	5,964	0	2,369	1,293	1,136	10,577	626	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	18,132	4,437	9,827	5,964	0	2,369	1,293	1,136	10,577	626	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	9,066	2,219	4,913	2,982	0	1,184	647	568	5,288	313	cubic-feet
	23	Option 2 - Provided Storage Volume	9,066	2,219	4,913	2,982	0	1,184	647	568	5,288	313	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**n/a**	**0**	**0**	**0**	**0**	**0**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	D11	D12	D13	D14	D15	D16	D17	D18	D20A	D20B	unitless
	1	Effective Tributary Area	7,412	12,966	22,642	24,100	8,085	7,379	9,601	12,931	52,428	52,428	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	ratio
	3	Design Capture Volume Tributary to BMP	401	702	1,226	1,305	438	400	520	700	2,840	2,840	cubic-feet
	4	Provided Biofiltration Surface Area	420	750	1,260	1,120	460	420	540	730	3,030	3,030	sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	10	10	10	10	10	inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18	18	18	18	inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18	18	18	18	18	inches
	8	Hydromodification Orifice Diameter of Underdrain	0.50	0.50	0.80	0.80	0.50	0.50	0.50	0.50	0.80	1.30	inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.013	0.013	0.033	0.033	0.013	0.013	0.013	0.013	0.033	0.086	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	1.32	0.74	1.12	1.26	1.20	1.32	1.03	0.76	0.47	1.23	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	1.32	0.74	1.12	1.26	1.20	1.32	1.03	0.76	0.47	1.23	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	7.91	4.43	6.74	7.58	7.22	7.91	6.15	4.55	2.80	7.38	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	inches
	17	Drawdown Time for Surface Ponding	8	14	9	8	8	8	10	13	21	8	hours
	18	Drawdown Time for Entire Biofiltration Basin	17	31	20	18	19	17	22	30	48	18	hours
	19	Total Depth Biofiltered	30.51	27.03	29.34	30.18	29.82	30.51	28.75	27.15	25.40	29.98	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	602	1,053	1,839	1,958	657	600	780	1,050	4,260	4,260	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	602	1,053	1,839	1,958	657	600	780	1,050	4,260	4,260	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	301	527	920	979	329	300	390	525	2,130	2,130	cubic-feet
	23	Option 2 - Provided Storage Volume	301	527	920	979	329	300	390	525	2,130	2,130	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	D21	D22	D23	D24	D25W	D25E	-	-	-	-	unitless
	1	Effective Tributary Area	19,693	27,018	14,639	55,242	136,446	103,222	-	-	-	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	-	-	-	-	ratio
	3	Design Capture Volume Tributary to BMP	1,067	1,463	793	2,992	7,391	5,591	-	-	-	-	cubic-feet
	4	Provided Biofiltration Surface Area	1,100	1,510	820	3,600	12,800	10,700					sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	10					inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18					inches
	7	Provided Gravel Storage Thickness	18	18	18	48	18	18					inches
	8	Hydromodification Orifice Diameter of Underdrain	0.80	0.80	0.60	1.50	2.50	2.50					inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.033	0.033	0.018	0.148	0.317	0.317	n/a	n/a	n/a	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	1.29	0.94	0.97	1.78	1.07	1.28	n/a	n/a	n/a	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	1.29	0.94	0.97	1.78	1.07	1.28	5.00	5.00	5.00	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	7.72	5.62	5.83	10.65	6.42	7.68	0.00	0.00	0.00	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	22.6	22.6	22.6	34.6	22.6	22.6	0	0	0	0	inches
	17	Drawdown Time for Surface Ponding	8	11	10	6	9	8	0	0	0	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	18	24	23	19	21	18	0	0	0	0	hours
	19	Total Depth Biofiltered	30.32	28.22	28.43	45.25	29.02	30.28	0.00	0.00	0.00	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	1,601	2,195	1,190	4,488	11,087	8,387	0	0	0	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	1,601	2,195	1,190	4,488	11,087	8,387	0	0	0	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	800	1,097	595	2,244	5,543	4,193	0	0	0	0	cubic-feet
	23	Option 2 - Provided Storage Volume	800	1,097	595	2,244	5,543	4,193	0	0	0	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**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 Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	D1	D2	D3	D4	D5/NA	D6	D7	D8	D9	D10	unitless
	Total Area Tributary to BMP	268,866	65,800	145,709	88,448	0	35,111	19,176	16,829	158,756	9,382	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.83	0.83	0.83	0.83	0.00	0.83	0.83	0.83	0.82	0.82	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0	0.65	0.65	0.65	0.65	0.65	inches
	Initial Design Capture Volume	12,088	2,958	6,551	3,976	0	1,579	862	757	7,051	417	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.83	0.83	0.83	0.83	n/a	0.83	0.83	0.83	0.82	0.82	unitless
	Final Effective Tributary Area	223,159	54,614	120,938	73,412	0	29,142	15,916	13,968	130,180	7,693	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	Design Capture Volume Tributary to BMP	12,088	2,958	6,551	3,976	0	1,579	862	757	7,051	417	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	0	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	#REF!	0	0	0	0	-	0	0	0	0	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

Summary of Stormwater Pollutant Control Calculations (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	D11	D12	D13	D14	D15	D16	D17	D18	D20A	D20B	unitless
	Total Area Tributary to BMP	9,039	15,812	27,612	29,390	9,860	8,999	11,709	15,769	63,937	63,937	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	inches
	Initial Design Capture Volume	401	702	1,226	1,305	438	400	520	700	2,840	2,840	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	unitless
	Final Effective Tributary Area	7,412	12,966	22,642	24,100	8,085	7,379	9,601	12,931	52,428	52,428	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	Design Capture Volume Tributary to BMP	401	702	1,226	1,305	438	400	520	700	2,840	2,840	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	#REF!	0	0	0	0	0	0	0	0	0	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

Summary of Stormwater Pollutant Control Calculations (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	D21	D22	D23	D24	D25W	D25E	-	-	-	-	unitless
	Total Area Tributary to BMP	24,016	32,949	17,852	66,557	164,393	124,364	-	-	-	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.82	0.82	0.82	0.83	0.83	0.83	-	-	-	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	-	-	-	-	inches
	Initial Design Capture Volume	1,067	1,463	793	2,992	7,391	5,591	-	-	-	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.82	0.82	0.82	0.83	0.83	0.83	-	-	-	-	unitless
	Final Effective Tributary Area	19,693	27,018	14,639	55,242	136,446	103,222	-	-	-	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	-	-	-	-	cubic-feet
	Design Capture Volume Tributary to BMP	1,067	1,463	793	2,992	7,391	5,591	-	-	-	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	-	unitless
	#REF!	0	0	0	0	0	0	-	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	H1	H2	H3A	H4	H5	H6	H7	H8HR1	H9HR2	H10	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	44,505	12,569	68,149	19,459	18,681	17,966	15,827	677,146	140,316	60,047	sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	23,964	6,767	36,696	10,478	10,059	9,674	8,523	294,712	46,459	32,333	sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	68,469	19,336	104,845	29,937	28,740	27,640	24,350	971,858	186,775	92,380	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.72	0.75	0.69	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.72	0.75	0.69	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	47,244	13,342	72,343	20,657	19,831	19,072	16,802	699,738	140,081	63,742	sq-ft
	31	Initial Design Capture Volume	2,559	723	3,919	1,119	1,074	1,033	910	37,902	7,588	3,453	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	2,559	723	3,919	1,119	1,074	1,033	910	37,902	7,588	3,453	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	H11	H12	H13	H14A	H15	H3B	H14B				unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration				unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65				inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	34,012	106,554	16,964	202,353	43,324	8,375	79,903				sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	18,314	57,367	9,134	123,511	43,324	4,510	43,024				sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	52,326	163,921	26,098	325,864	86,648	12,885	122,927	0	0	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.69	0.69	0.69	0.67	0.60	0.69	0.69	0.00	0.00	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.69	0.69	0.69	0.67	0.60	0.69	0.69	n/a	n/a	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	36,105	113,105	18,008	218,329	51,989	8,891	84,820	0	0	0	sq-ft
	31	Initial Design Capture Volume	1,956	6,127	975	11,826	2,816	482	4,594	0	0	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	1,956	6,127	975	11,826	2,816	482	4,594	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).

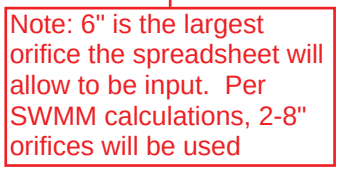
B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	H1	H2	H3A	H4	H5	H6	H7	H8HR1	H9HR2	H10	unitless
	1	Effective Tributary Area	47,244	13,342	72,343	20,657	19,831	19,072	16,802	699,738	140,081	63,742	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	ratio
	3	Design Capture Volume Tributary to BMP	2,559	723	3,919	1,119	1,074	1,033	910	37,902	7,588	3,453	cubic-feet
	4	Provided Biofiltration Surface Area	2,120	655	3,350	950	1,010	860	765	32,465	7,430	2,850	sq-ft
	5	Provided Surface Ponding Depth	6	6	10	6	6	6	6	6	6	10	inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18	18	18	18	inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18	18	27	18	18	inches
	8	Hydromodification Orifice Diameter of Underdrain	3.00	1.50	3.50	2.00	2.00	1.70	1.70	6.00	6.00	2.50	inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.434	0.110	0.618	0.194	0.194	0.141	0.141	1.891	1.704	0.317	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	8.85	7.23	7.97	8.83	8.31	7.06	7.94	2.52	9.91	4.80	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	5.00	5.00	5.00	5.00	5.00	5.00	5.00	2.52	5.00	4.80	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	30.00	30.00	30.00	30.00	30.00	30.00	30.00	15.10	30.00	28.83	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	18.6	18.6	22.6	18.6	18.6	18.6	18.6	22.2	18.6	22.6	inches
	17	Drawdown Time for Surface Ponding	1	1	2	1	1	1	1	2	1	2	hours
	18	Drawdown Time for Entire Biofiltration Basin	4	4	5	4	4	4	4	9	4	5	hours
	19	Total Depth Biofiltered	48.60	48.60	52.60	48.60	48.60	48.60	48.60	37.30	48.60	51.43	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	3,839	1,085	5,879	1,679	1,611	1,550	1,365	56,853	11,382	5,180	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	3,839	1,085	5,879	1,679	1,611	1,550	1,365	56,853	11,382	5,180	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	1,919	542	2,939	839	806	775	683	28,427	5,691	2,590	cubic-feet
	23	Option 2 - Provided Storage Volume	1,919	542	2,939	839	806	775	683	28,427	5,691	2,590	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.



Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	H11	H12	H13	H14A	H15	H3B	H14B	-	-	-	unitless
	1	Effective Tributary Area	36,105	113,105	18,008	218,329	51,989	8,891	84,820	-	-	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	-	-	ratio
	3	Design Capture Volume Tributary to BMP	1,956	6,127	975	11,826	2,816	482	4,594	-	-	-	cubic-feet
	4	Provided Biofiltration Surface Area	1,650	5,076	900	9,760	2,755	450	3,800				sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	10	10				inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18				inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18	18				inches
	8	Hydromodification Orifice Diameter of Underdrain	2.00	3.00	1.00	5.00	2.00	1.00	3.00				inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.203	0.455	0.051	1.250	0.203	0.051	0.455	n/a	n/a	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	5.33	3.87	2.45	5.53	3.19	4.91	5.17	n/a	n/a	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	5.00	3.87	2.45	5.00	3.19	4.91	5.00	5.00	5.00	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	30.00	23.24	14.73	30.00	19.14	29.46	30.00	0.00	0.00	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	22.6	22.6	22.6	22.6	22.6	22.6	22.6	0	0	0	inches
	17	Drawdown Time for Surface Ponding	2	3	4	2	3	2	2	0	0	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	5	6	9	5	7	5	5	0	0	0	hours
	19	Total Depth Biofiltered	52.60	45.84	37.33	52.60	41.74	52.06	52.60	0.00	0.00	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	2,934	9,191	1,463	17,739	4,224	723	6,891	0	0	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	2,934	9,191	1,463	17,739	4,224	723	6,891	0	0	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	1,467	4,595	731	8,870	2,112	362	3,446	0	0	0	cubic-feet
	23	Option 2 - Provided Storage Volume	1,467	4,595	731	8,870	2,112	362	3,446	0	0	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	H1	H2	H3A	H4	H5	H6	H7	H8HR1	H9HR2	H10	unitless
	Total Area Tributary to BMP	68,469	19,336	104,845	29,937	28,740	27,640	24,350	971,858	186,775	92,380	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.72	0.75	0.69	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	inches
	Initial Design Capture Volume	2,559	723	3,919	1,119	1,074	1,033	910	37,902	7,588	3,453	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.72	0.75	0.69	unitless
	Final Effective Tributary Area	47,244	13,342	72,343	20,657	19,831	19,072	16,802	699,738	140,081	63,742	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	Design Capture Volume Tributary to BMP	2,559	723	3,919	1,119	1,074	1,033	910	37,902	7,588	3,453	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

Summary of Stormwater Pollutant Control Calculations (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	H11	H12	H13	H14A	H15	H3B	H14B	-	-	-	unitless
	Total Area Tributary to BMP	52,326	163,921	26,098	325,864	86,648	12,885	122,927	-	-	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.69	0.69	0.69	0.67	0.60	0.69	0.69	-	-	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	-	-	-	inches
	Initial Design Capture Volume	1,956	6,127	975	11,826	2,816	482	4,594	-	-	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.69	0.69	0.69	0.67	0.60	0.69	0.69	-	-	-	unitless
	Final Effective Tributary Area	36,105	113,105	18,008	218,329	51,989	8,891	84,820	-	-	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	-	-	-	cubic-feet
	Design Capture Volume Tributary to BMP	1,956	6,127	975	11,826	2,816	482	4,594	-	-	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	KR1	K2	K3	K4	K5	K6	K7K9	K8	K10		unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration		unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65		inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	90,448	333,318	82,147	84,082	90,852	83,329	117,157	850,000	83,122		sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	90,448	333,318	82,147	84,082	90,852	83,329	117,157	850,000	83,122		sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	180,896	666,636	164,294	168,164	181,704	166,658	234,314	1,700,000	166,244	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	108,538	399,982	98,576	100,898	109,022	99,995	140,588	1,020,000	99,746	0	sq-ft
	31	Initial Design Capture Volume	5,879	21,666	5,340	5,465	5,905	5,416	7,615	55,250	5,403	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	5,879	21,666	5,340	5,465	5,905	5,416	7,615	55,250	5,403	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	KR1	K2	K3	K4	K5	K6	K7K9	K8	K10	-	unitless
	1	Effective Tributary Area	108,538	399,982	98,576	100,898	109,022	99,995	140,588	1,020,000	99,746	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	ratio
	3	Design Capture Volume Tributary to BMP	5,879	21,666	5,340	5,465	5,905	5,416	7,615	55,250	5,403	-	cubic-feet
	4	Provided Biofiltration Surface Area	5,535	16,540	4,068	4,200	4,500	4,160	6,000	42,327	4,180		sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	10	10	10	10		inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18	18	18		inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18	18	18	18		inches
	8	Hydromodification Orifice Diameter of Underdrain	2.50	6.00	3.00	2.00	4.00	3.00	3.00	6.00	3.00		inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.317	1.790	0.455	0.203	0.805	0.455	0.455	1.790	0.455	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	2.47	4.67	4.83	2.09	7.72	4.73	3.28	1.83	4.70	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	2.47	4.67	4.83	2.09	5.00	4.73	3.28	1.83	4.70	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	14.84	28.05	29.00	12.55	30.00	28.36	19.66	10.96	28.22	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	0	inches
	17	Drawdown Time for Surface Ponding	4	2	2	5	2	2	3	5	2	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	9	5	5	11	5	5	7	12	5	0	hours
	19	Total Depth Biofiltered	37.44	50.65	51.60	35.15	52.60	50.96	42.26	33.56	50.82	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	8,819	32,499	8,010	8,198	8,858	8,124	11,423	82,875	8,105	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	8,819	32,499	8,010	8,198	8,858	8,124	11,423	82,875	8,105	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	4,409	16,250	4,005	4,099	4,429	4,062	5,711	41,438	4,052	0	cubic-feet
	23	Option 2 - Provided Storage Volume	4,409	16,250	4,005	4,099	4,429	4,062	5,711	41,438	4,052	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Note: 6" is largest orifice the spreadsheet will allow. Per SWMM model, 2-8" orifices will be used

Summary of Stormwater Pollutant Control Calculations (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	KR1	K2	K3	K4	K5	K6	K7K9	K8	K10	-	unitless
	Total Area Tributary to BMP	180,896	666,636	164,294	168,164	181,704	166,658	234,314	1,700,000	166,244	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	-	inches
	Initial Design Capture Volume	5,879	21,666	5,340	5,465	5,905	5,416	7,615	55,250	5,403	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	-	unitless
	Final Effective Tributary Area	108,538	399,982	98,576	100,898	109,022	99,995	140,588	1,020,000	99,746	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	-	cubic-feet
	Design Capture Volume Tributary to BMP	5,879	21,666	5,340	5,465	5,905	5,416	7,615	55,250	5,403	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	M1MR1K1	M2	M3A	M4	M3B	M8					unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration					unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65					inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	1,395,205	398,747	19,351	135,393	94,450	287,098					sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	26,037										sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	716,768	214,710	10,420	72,904	50,857	154,591					sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	2,138,010	613,457	29,771	208,297	145,307	441,689	0	0	0	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.69	0.69	0.69	0.69	0.69	0.69	0.00	0.00	0.00	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.69	0.69	0.69	0.69	0.69	0.69	n/a	n/a	n/a	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	1,475,227	423,285	20,542	143,725	100,262	304,765	0	0	0	0	sq-ft
	31	Initial Design Capture Volume	79,908	22,928	1,113	7,785	5,431	16,508	0	0	0	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	79,908	22,928	1,113	7,785	5,431	16,508	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	M1MR1K1	M2	M3A	M4	M3B	M8	-	-	-	-	unitless
	1	Effective Tributary Area	1,475,227	423,285	20,542	143,725	100,262	304,765	-	-	-	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	-	-	-	-	ratio
	3	Design Capture Volume Tributary to BMP	79,908	22,928	1,113	7,785	5,431	16,508	-	-	-	-	cubic-feet
	4	Provided Biofiltration Surface Area	94,224	19,480	930	6,509	4,500	13,640					sq-ft
	5	Provided Surface Ponding Depth	24	10	10	10	10	24					inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18					inches
	7	Provided Gravel Storage Thickness	30	18	18	18	18	30					inches
	8	Hydromodification Orifice Diameter of Underdrain	6.00	6.00	1.00	4.00	3.00	6.00					inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	2.267	1.790	0.051	0.805	0.455	2.267	n/a	n/a	n/a	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	1.04	3.97	2.38	5.34	4.37	7.18	n/a	n/a	n/a	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	1.04	3.97	2.38	5.00	4.37	5.00	5.00	5.00	5.00	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	6.24	23.81	14.25	30.00	26.22	30.00	0.00	0.00	0.00	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	41.4	22.6	22.6	22.6	22.6	41.4	0	0	0	0	inches
	17	Drawdown Time for Surface Ponding	23	3	4	2	2	5	0	0	0	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	40	6	10	5	5	8	0	0	0	0	hours
	19	Total Depth Biofiltered	47.64	46.41	36.85	52.60	48.82	71.40	0.00	0.00	0.00	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	119,862	34,392	1,670	11,678	8,147	24,762	0	0	0	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	119,862	34,392	1,670	11,678	8,147	24,762	0	0	0	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	59,931	17,196	835	5,839	4,073	12,381	0	0	0	0	cubic-feet
	23	Option 2 - Provided Storage Volume	59,931	17,196	835	5,839	4,073	12,381	0	0	0	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**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 Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	M1MR1K1	M2	M3A	M4	M3B	M8	-	-	-	-	unitless
	Total Area Tributary to BMP	2,138,010	613,457	29,771	208,297	145,307	441,689	-	-	-	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.69	0.69	0.69	0.69	0.69	0.69	-	-	-	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	-	-	-	-	inches
	Initial Design Capture Volume	79,908	22,928	1,113	7,785	5,431	16,508	-	-	-	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.69	0.69	0.69	0.69	0.69	0.69	-	-	-	-	unitless
	Final Effective Tributary Area	1,475,227	423,285	20,542	143,725	100,262	304,765	-	-	-	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	-	-	-	-	cubic-feet
	Design Capture Volume Tributary to BMP	79,908	22,928	1,113	7,785	5,431	16,508	-	-	-	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	-	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	-	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	SL1	SL2	SL3	SL4	SL8	SL9					unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration					unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65					inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	143,375	94,941	29,162	68,942	8,334	8,802					sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	69,553	10,549	25,294	68,942							sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	212,928	105,490	54,456	137,884	8,334	8,802	0	0	0	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.68	0.83	0.59	0.57	0.90	0.90	0.00	0.00	0.00	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.68	0.83	0.59	0.57	0.90	0.90	n/a	n/a	n/a	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	144,791	87,557	32,129	78,594	7,501	7,922	0	0	0	0	sq-ft
	31	Initial Design Capture Volume	7,843	4,743	1,740	4,257	406	429	0	0	0	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	7,843	4,743	1,740	4,257	406	429	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	SL1	SL2	SL3	SL4	SL8	SL9	-	-	-	-	unitless
	1	Effective Tributary Area	144,791	87,557	32,129	78,594	7,501	7,922	-	-	-	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	-	-	-	-	ratio
	3	Design Capture Volume Tributary to BMP	7,843	4,743	1,740	4,257	406	429	-	-	-	-	cubic-feet
	4	Provided Biofiltration Surface Area	7,000	4,800	1,450	3,500	275	275					sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	10					inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18					inches
	7	Provided Gravel Storage Thickness	48	48	48	48	48	48					inches
	8	Hydromodification Orifice Diameter of Underdrain	2.00	1.90	1.00	2.00	0.60	0.60					inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.263	0.237	0.066	0.263	0.024	0.024	n/a	n/a	n/a	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	1.62	2.13	1.96	3.24	3.73	3.73	n/a	n/a	n/a	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	1.62	2.13	1.96	3.24	3.73	3.73	5.00	5.00	5.00	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	9.72	12.80	11.78	19.45	22.38	22.38	0.00	0.00	0.00	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	34.6	34.6	34.6	34.6	34.6	34.6	0	0	0	0	inches
	17	Drawdown Time for Surface Ponding	6	5	5	3	3	3	0	0	0	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	21	16	18	11	9	9	0	0	0	0	hours
	19	Total Depth Biofiltered	44.32	47.40	46.38	54.05	56.98	56.98	0.00	0.00	0.00	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	11,765	7,115	2,610	6,386	609	644	0	0	0	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	11,765	7,115	2,610	6,386	609	644	0	0	0	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	5,882	3,557	1,305	3,193	305	322	0	0	0	0	cubic-feet
	23	Option 2 - Provided Storage Volume	5,882	3,557	1,305	3,193	305	322	0	0	0	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**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 Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	SL1	SL2	SL3	SL4	SL8	SL9	-	-	-	-	unitless
	Total Area Tributary to BMP	212,928	105,490	54,456	137,884	8,334	8,802	-	-	-	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.68	0.83	0.59	0.57	0.90	0.90	-	-	-	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	-	-	-	-	inches
	Initial Design Capture Volume	7,843	4,743	1,740	4,257	406	429	-	-	-	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.68	0.83	0.59	0.57	0.90	0.90	-	-	-	-	unitless
	Final Effective Tributary Area	144,791	87,557	32,129	78,594	7,501	7,922	-	-	-	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	-	-	-	-	cubic-feet
	Design Capture Volume Tributary to BMP	7,843	4,743	1,740	4,257	406	429	-	-	-	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	-	unitless
	#REF!	0	0	0	0	0	0	-	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	74,202	216,739	83,846	66,142	93,960	65,064	230,396	126,345	97,154	54,048	sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)											sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	74,202	216,739	83,846	66,142	93,960	65,064	230,396	126,345	97,154	54,048	sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	148,404	433,478	167,692	132,284	187,920	130,128	460,792	252,690	194,308	108,096	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	89,042	260,087	100,615	79,370	112,752	78,077	276,475	151,614	116,585	64,858	sq-ft
	31	Initial Design Capture Volume	4,823	14,088	5,450	4,299	6,107	4,229	14,976	8,212	6,315	3,513	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	4,823	14,088	5,450	4,299	6,107	4,229	14,976	8,212	6,315	3,513	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	unitless
	1	Effective Tributary Area	89,042	260,087	100,615	79,370	112,752	78,077	276,475	151,614	116,585	64,858	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	ratio
	3	Design Capture Volume Tributary to BMP	4,823	14,088	5,450	4,299	6,107	4,229	14,976	8,212	6,315	3,513	cubic-feet
	4	Provided Biofiltration Surface Area	3,725	13,250	5,350	3,380	5,400	3,400	12,500	6,400	5,400	2,700	sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	10	10	10	10	10	inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18	18	18	18	inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18	18	18	18	18	inches
	8	Hydromodification Orifice Diameter of Underdrain	3.00	4.00	4.00	3.00	4.00	4.00	6.00	4.00	4.00	2.00	inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.455	0.805	0.805	0.455	0.805	0.805	1.790	0.805	0.805	0.203	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	5.28	2.62	6.50	5.82	6.44	10.22	6.19	5.43	6.44	3.25	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	5.00	2.62	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.25	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	30.00	15.74	30.00	30.00	30.00	30.00	30.00	30.00	30.00	19.53	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	inches
	17	Drawdown Time for Surface Ponding	2	4	2	2	2	2	2	2	2	3	hours
	18	Drawdown Time for Entire Biofiltration Basin	5	9	5	5	5	5	5	5	5	7	hours
	19	Total Depth Biofiltered	52.60	38.34	52.60	52.60	52.60	52.60	52.60	52.60	52.60	42.13	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	7,235	21,132	8,175	6,449	9,161	6,344	22,464	12,318	9,473	5,270	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	7,235	21,132	8,175	6,449	9,161	6,344	22,464	12,318	9,473	5,270	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	3,617	10,566	4,088	3,224	4,580	3,172	11,232	6,159	4,736	2,635	cubic-feet
	23	Option 2 - Provided Storage Volume	3,617	10,566	4,088	3,224	4,580	3,172	11,232	6,159	4,736	2,635	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	unitless
	Total Area Tributary to BMP	148,404	433,478	167,692	132,284	187,920	130,128	460,792	252,690	194,308	108,096	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	inches
	Initial Design Capture Volume	4,823	14,088	5,450	4,299	6,107	4,229	14,976	8,212	6,315	3,513	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	unitless
	Final Effective Tributary Area	89,042	260,087	100,615	79,370	112,752	78,077	276,475	151,614	116,585	64,858	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	Design Capture Volume Tributary to BMP	4,823	14,088	5,450	4,299	6,107	4,229	14,976	8,212	6,315	3,513	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	TR1T1T2	TR2	T3	T4	T5	T6	T7				unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration				unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65				inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	555,008	39,904	178,208	57,381	20,402	79,693	97,547				sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	59,910	4,434	633	29,816	1,437	42,911	52,525				sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	163,947		95,295	1,081	9,548						sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	778,865	44,338	274,136	88,278	31,387	122,604	150,072	0	0	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.72	0.83	0.69	0.67	0.69	0.67	0.67	0.00	0.00	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.72	0.83	0.69	0.67	0.69	0.67	0.67	n/a	n/a	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	560,783	36,801	189,154	59,146	21,657	82,145	100,548	0	0	0	sq-ft
	31	Initial Design Capture Volume	30,376	1,993	10,246	3,204	1,173	4,450	5,446	0	0	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	30,376	1,993	10,246	3,204	1,173	4,450	5,446	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	TR1T1T2	TR2	T3	T4	T5	T6	T7	-	-	-	unitless
	1	Effective Tributary Area	560,783	36,801	189,154	59,146	21,657	82,145	100,548	-	-	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	-	-	ratio
	3	Design Capture Volume Tributary to BMP	30,376	1,993	10,246	3,204	1,173	4,450	5,446	-	-	-	cubic-feet
	4	Provided Biofiltration Surface Area	26,864	2,104	8,486	3,150	990	4,317	5,245				sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	10	10				inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18				inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18	18				inches
	8	Hydromodification Orifice Diameter of Underdrain	6.00	2.00	4.00	2.50	1.00	3.00	3.00				inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	1.790	0.203	0.805	0.317	0.051	0.455	0.455	n/a	n/a	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	2.88	4.18	4.10	4.35	2.23	4.55	3.75	n/a	n/a	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	2.88	4.18	4.10	4.35	2.23	4.55	3.75	5.00	5.00	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	17.27	25.06	24.58	26.08	13.39	27.33	22.49	0.00	0.00	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	22.6	22.6	22.6	22.6	22.6	22.6	22.6	0	0	0	inches
	17	Drawdown Time for Surface Ponding	3	2	2	2	4	2	3	0	0	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	8	5	6	5	10	5	6	0	0	0	hours
	19	Total Depth Biofiltered	39.87	47.66	47.18	48.68	35.99	49.93	45.09	0.00	0.00	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	45,564	2,990	15,369	4,806	1,760	6,675	8,169	0	0	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	45,564	2,990	15,369	4,806	1,760	6,675	8,169	0	0	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	22,782	1,495	7,685	2,403	880	3,338	4,085	0	0	0	cubic-feet
	23	Option 2 - Provided Storage Volume	22,782	1,495	7,685	2,403	880	3,338	4,085	0	0	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	TR1T1T2	TR2	T3	T4	T5	T6	T7	-	-	-	unitless
	Total Area Tributary to BMP	778,865	44,338	274,136	88,278	31,387	122,604	150,072	-	-	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.72	0.83	0.69	0.67	0.69	0.67	0.67	-	-	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	-	-	-	inches
	Initial Design Capture Volume	30,376	1,993	10,246	3,204	1,173	4,450	5,446	-	-	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.72	0.83	0.69	0.67	0.69	0.67	0.67	-	-	-	unitless
	Final Effective Tributary Area	560,783	36,801	189,154	59,146	21,657	82,145	100,548	-	-	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	-	-	-	cubic-feet
	Design Capture Volume Tributary to BMP	30,376	1,993	10,246	3,204	1,173	4,450	5,446	-	-	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	TC1	TC2TCR1	TC3	TC4	TC5	TCR2	TCR3				unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration				unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65				inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	128,315	205,754	202,835	54,796	67,216	74,981	320,037				sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)							29,171				sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	67,603	132,015	35,794	5,147	11,862	767	53,219				sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	60,712	43,273		4,423		7,564	2,677				sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	256,630	381,042	238,629	64,366	79,078	83,312	405,104	0	0	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.58	0.60	0.80	0.81	0.80	0.84	0.75	0.00	0.00	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.58	0.60	0.80	0.81	0.80	0.84	0.75	n/a	n/a	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	148,845	228,625	190,903	52,136	63,262	69,982	303,828	0	0	0	sq-ft
	31	Initial Design Capture Volume	8,062	12,384	10,341	2,824	3,427	3,791	16,457	0	0	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	8,062	12,384	10,341	2,824	3,427	3,791	16,457	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	TC1	TC2TCR1	TC3	TC4	TC5	TCR2	TCR3	-	-	-	unitless
	1	Effective Tributary Area	148,845	228,625	190,903	52,136	63,262	69,982	303,828	-	-	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	-	-	ratio
	3	Design Capture Volume Tributary to BMP	8,062	12,384	10,341	2,824	3,427	3,791	16,457	-	-	-	cubic-feet
	4	Provided Biofiltration Surface Area	6,740	17,108	12,580	3,170	4,200	3,900	20,200				sq-ft
	5	Provided Surface Ponding Depth	10	10	10	10	10	60	60				inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18				inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18	18				inches
	8	Hydromodification Orifice Diameter of Underdrain	5.00	5.00	5.00	2.00	2.00	2.00	5.00				inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	1.250	1.250	1.250	0.203	0.203	0.296	1.833	n/a	n/a	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	8.01	3.16	4.29	2.77	2.09	3.27	3.92	n/a	n/a	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	5.00	3.16	4.29	2.77	2.09	3.27	3.92	5.00	5.00	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	30.00	18.94	25.76	16.63	12.55	19.64	23.52	0.00	0.00	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	22.6	22.6	22.6	22.6	22.6	72.6	72.6	0	0	0	inches
	17	Drawdown Time for Surface Ponding	2	3	2	4	5	18	15	0	0	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	5	7	5	8	11	22	19	0	0	0	hours
	19	Total Depth Biofiltered	52.60	41.54	48.36	39.23	35.15	92.24	96.12	0.00	0.00	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	12,093	18,576	15,512	4,236	5,141	5,687	24,686	0	0	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	12,093	18,576	15,512	4,236	5,141	5,687	24,686	0	0	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	6,047	9,288	7,756	2,118	2,570	2,843	12,343	0	0	0	cubic-feet
	23	Option 2 - Provided Storage Volume	6,047	9,288	7,756	2,118	2,570	2,843	12,343	0	0	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	TC1	TC2TCR1	TC3	TC4	TC5	TCR2	TCR3	-	-	-	unitless
	Total Area Tributary to BMP	256,630	381,042	238,629	64,366	79,078	83,312	405,104	-	-	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.58	0.60	0.80	0.81	0.80	0.84	0.75	-	-	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	-	-	-	inches
	Initial Design Capture Volume	8,062	12,384	10,341	2,824	3,427	3,791	16,457	-	-	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.58	0.60	0.80	0.81	0.80	0.84	0.75	-	-	-	unitless
	Final Effective Tributary Area	148,845	228,625	190,903	52,136	63,262	69,982	303,828	-	-	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	-	-	-	cubic-feet
	Design Capture Volume Tributary to BMP	8,062	12,384	10,341	2,824	3,427	3,791	16,457	-	-	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	113,136	113,025	36,825	54,412	87,425	35,783	92,703	56,224	93,333	325,315	sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	113,136	113,025	36,825	54,412	87,425	35,783	92,703	56,224	93,333	108,083	sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)										355	sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	226,272	226,050	73,650	108,824	174,850	71,566	185,406	112,448	186,666	433,753	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.73	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.73	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	128,975	128,849	41,981	62,030	99,665	40,793	105,681	64,095	106,400	316,640	sq-ft
	31	Initial Design Capture Volume	6,986	6,979	2,274	3,360	5,399	2,210	5,724	3,472	5,763	17,151	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	6,986	6,979	2,274	3,360	5,399	2,210	5,724	3,472	5,763	17,151	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	V11VR2	V12VR1	V13	V14	V15	V16	V17				unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration				unitless
	2	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65				inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	397,802	136,034	115,186	168,029	247,820	59,728	37,440				sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	118,646	21,954	38,396	54,540	63,413	59,728					sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)				1,471	19,194						sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A											#
	19	Average Mature Tree Canopy Diameter											ft
	20	Number of Rain Barrels Proposed per SD-E											#
	21	Average Rain Barrel Size											gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	516,448	157,988	153,582	224,040	330,427	119,456	37,440	0	0	0	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	0.75	0.81	0.73	0.73	0.74	0.57	0.90	0.00	0.00	0.00	unitless
	24	Initial Composite Runoff 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	unitless
	25	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	26	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	28	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
	29	Final Adjusted Tributary Runoff Factor	0.75	0.81	0.73	0.73	0.74	0.57	0.90	n/a	n/a	n/a	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	387,336	127,970	112,115	163,549	244,516	68,090	33,696	0	0	0	sq-ft
	31	Initial Design Capture Volume	20,981	6,932	6,073	8,859	13,245	3,688	1,825	0	0	0	cubic-feet
	32	Volume Reduction per Tree Well	0	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	20,981	6,932	6,073	8,859	13,245	3,688	1,825	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).

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	unitless
	1	Effective Tributary Area	128,975	128,849	41,981	62,030	99,665	40,793	105,681	64,095	106,400	316,640	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	ratio
	3	Design Capture Volume Tributary to BMP	6,986	6,979	2,274	3,360	5,399	2,210	5,724	3,472	5,763	17,151	cubic-feet
	4	Provided Biofiltration Surface Area	5,865	5,840	1,920	2,820	4,520	1,855	4,800	3,100	4,850	16,475	sq-ft
	5	Provided Surface Ponding Depth	6	6	6	6	6	6	6	6	6	6	inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18	18	18	18	inches
	7	Provided Gravel Storage Thickness	18	18	18	18	18	18	18	18	18	18	inches
	8	Hydromodification Orifice Diameter of Underdrain	3.00	3.00	2.50	3.50	3.00	2.50	3.00	3.50	3.00	6.00	inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	0.434	0.434	0.302	0.589	0.434	0.302	0.434	0.589	0.434	1.704	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	3.20	3.21	6.81	9.03	4.15	7.04	3.91	8.21	3.87	4.47	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	3.20	3.21	5.00	5.00	4.15	5.00	3.91	5.00	3.87	4.47	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	19.19	19.27	30.00	30.00	24.90	30.00	23.45	30.00	23.21	26.81	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	inches
	17	Drawdown Time for Surface Ponding	2	2	1	1	1	1	2	1	2	1	hours
	18	Drawdown Time for Entire Biofiltration Basin	6	6	4	4	4	4	5	4	5	4	hours
	19	Total Depth Biofiltered	37.79	37.87	48.60	48.60	43.50	48.60	42.05	48.60	41.81	45.41	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	10,479	10,469	3,411	5,040	8,099	3,315	8,586	5,208	8,645	25,727	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	10,479	10,469	3,411	5,040	8,099	3,315	8,586	5,208	8,645	25,727	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	5,240	5,234	1,706	2,520	4,049	1,658	4,293	2,604	4,322	12,863	cubic-feet
	23	Option 2 - Provided Storage Volume	5,240	5,234	1,706	2,520	4,049	1,658	4,293	2,604	4,322	12,863	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Automated Worksheet B.5-1: Sizing Biofiltration BMPs (V1.1)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	V11VR2	V12VR1	V13	V14	V15	V16	V17	-	-	-	unitless
	1	Effective Tributary Area	387,336	127,970	112,115	163,549	244,516	68,090	33,696	-	-	-	sq-ft
	2	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	-	-	ratio
	3	Design Capture Volume Tributary to BMP	20,981	6,932	6,073	8,859	13,245	3,688	1,825	-	-	-	cubic-feet
	4	Provided Biofiltration Surface Area	20,200	7,105	5,960	7,865	12,540	3,300	1,750				sq-ft
	5	Provided Surface Ponding Depth	24	6	6	24	6	6	6				inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18				inches
	7	Provided Gravel Storage Thickness	24	18	18	18	18	18	18				inches
	8	Hydromodification Orifice Diameter of Underdrain	6.00	6.00	3.50	6.00	6.00	3.50	2.00				inches
Biofiltration Calculations	9	Max Hydromod Flow Rate through Underdrain	2.166	1.704	0.589	2.060	1.704	0.589	0.194	n/a	n/a	n/a	CFS
	10	Max Soil Filtration Rate Allowed by Underdrain Orifice	4.63	10.36	4.27	11.32	5.87	7.71	4.79	n/a	n/a	n/a	in/hr
	11	Soil Media Filtration Rate	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	12	Soil Media Filtration Rate to be used for Sizing	4.63	5.00	4.27	5.00	5.00	5.00	4.79	5.00	5.00	5.00	in/hr
	13	Depth Biofiltered Over 6 Hour Storm	27.80	30.00	25.62	30.00	30.00	30.00	28.76	0.00	0.00	0.00	inches
	14	Soil Media Pore Space	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	unitless
	15	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	16	Effective Depth of Biofiltration Storage	39	18.6	18.6	36.6	18.6	18.6	18.6	0	0	0	inches
	17	Drawdown Time for Surface Ponding	5	1	1	5	1	1	1	0	0	0	hours
	18	Drawdown Time for Entire Biofiltration Basin	8	4	4	7	4	4	4	0	0	0	hours
	19	Total Depth Biofiltered	66.80	48.60	44.22	66.60	48.60	48.60	47.36	0.00	0.00	0.00	inches
	20	Option 1 - Biofilter 1.50 DCV: Target Volume	31,472	10,398	9,110	13,289	19,868	5,532	2,738	0	0	0	cubic-feet
	21	Option 1 - Provided Biofiltration Volume	31,472	10,398	9,110	13,289	19,868	5,532	2,738	0	0	0	cubic-feet
	22	Option 2 - Store 0.75 DCV: Target Volume	15,736	5,199	4,555	6,644	9,934	2,766	1,369	0	0	0	cubic-feet
	23	Option 2 - Provided Storage Volume	15,736	5,199	4,555	6,644	9,934	2,766	1,369	0	0	0	cubic-feet
	24	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	ratio
Result	25	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined Biofiltration BMPs (BF-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 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 (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	unitless
	Total Area Tributary to BMP	226,272	226,050	73,650	108,824	174,850	71,566	185,406	112,448	186,666	433,753	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.73	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	inches
	Initial Design Capture Volume	6,986	6,979	2,274	3,360	5,399	2,210	5,724	3,472	5,763	17,151	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.73	unitless
	Final Effective Tributary Area	128,975	128,849	41,981	62,030	99,665	40,793	105,681	64,095	106,400	316,640	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	Design Capture Volume Tributary to BMP	6,986	6,979	2,274	3,360	5,399	2,210	5,724	3,472	5,763	17,151	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

Summary of Stormwater Pollutant Control Calculations (V1.1)

Category	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Drainage Basin Inputs	Drainage Basin ID or Name	V11VR2	V12VR1	V13	V14	V15	V16	V17	-	-	-	unitless
	Total Area Tributary to BMP	516,448	157,988	153,582	224,040	330,427	119,456	37,440	-	-	-	sq-ft
	Composite Runoff Factor for Standard Drainage Areas	0.75	0.81	0.73	0.73	0.74	0.57	0.90	-	-	-	unitless
	85th Percentile 24-hr Storm Depth	0.65	0.65	0.65	0.65	0.65	0.65	0.65	-	-	-	inches
	Initial Design Capture Volume	20,981	6,932	6,073	8,859	13,245	3,688	1,825	-	-	-	cubic-feet
Volume Reductions	Final Adjusted Tributary Runoff Factor	0.75	0.81	0.73	0.73	0.74	0.57	0.90	-	-	-	unitless
	Final Effective Tributary Area	387,336	127,970	112,115	163,549	244,516	68,090	33,696	-	-	-	sq-ft
	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	-	-	-	cubic-feet
	Design Capture Volume Tributary to BMP	20,981	6,932	6,073	8,859	13,245	3,688	1,825	-	-	-	cubic-feet
BMP Sizing	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	-	-	unitless
	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. Drainage basins achieving full compliance with performance requirements for onsite pollutant control are highlighted in green. Drainage basins not achieving full compliance are highlighted in red and summarized below. Please note that drainage areas using De Minimis, Self-Mitigating, and/or Self-Retaining classifications may be required to provide additional supporting information.

-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.

Attachment 1b

Form I-8

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?

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	☐	☒

Provide basis:

Majority of the site is soil type C + D, which typically have low infiltration rates. However, some areas of the site are underlain by type B soils, which may be appropriate for infiltration.

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	☐	☒

Provide basis:

Due to the presence of shallow bedrock throughout the majority of the site, infiltration could create seeps and slope stability concerns at the surface of the bedrock. Therefore, infiltration is not considered feasible in these locations. In areas of the site underlain by alluvial material, infiltration may be feasible without increasing the risk of geotechnical hazards.

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

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☒	☐

Provide basis:

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☒	☐
Provide basis: 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	**Full Infiltration Feasible** ☐	**Full Infiltration Infeasible** ☒

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

Categorization of Infiltration Feasibility Condition

Form I-8

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	☒	☒

Provide basis:

Due to the steepness of the existing terrain and proposed grades in conjunction with shallow bedrock, infiltration could result in seepage and slope stability concerns. In areas of the site that are less steep and are underlain by alluvial material, some infiltration may be feasible. Infiltration rates in these locations will be determined during final engineering. The SWMM model has been prepared assuming no infiltration at the BMPs, which is the most conservative approach. If infiltration is determined to be feasible during final engineering, the BMP sizes may be reduced.

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

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	☐	☒

Provide basis:

Due to the steepness of the existing terrain and proposed grades in conjunction with shallow bedrock, infiltration could result in seepage and slope stability concerns. In areas of the site that are less steep and are underlain by alluvial material, some infiltration may be feasible. Infiltration rates in these locations will be determined during final engineering. The SWMM model has been prepared assuming no infiltration at the BMPs, which is the most conservative approach. If infiltration is determined to be feasible during final engineering, the BMP sizes may be reduced.

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

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☒	☐

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
8	**Can infiltration be allowed without violating downstream water rights?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☒	☐
Provide basis: 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 partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is "**No**", infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.** Proceed to Part 2	**Partial Infiltration** ☒ **To Be Confirmed During Final Engineering**	**No Infiltration** ☒ **Assumed for preliminary BMP sizing**

Attachment 1c

DMA Exhibits

LEGEND

- DMA BOUNDARY
- PROPOSED ROADSIDE SWALE (IMPERVIOUS AREA DISPERSION)
- PROPOSED INTEGRATED MANAGEMENT PRACTICE (IMP)
- PROPOSED LOTS – COMMERCIAL (85% IMPERVIOUS)
- PROPOSED LOTS – CONDOS (65% IMPERVIOUS)
- PROPOSED LOTS – SCHOOL (50% IMPERVIOUS)
- PROPOSED LOTS – TERRACES A (65% IMPERVIOUS)
- PROPOSED LOTS – TERRACES B (65% IMPERVIOUS)
- PROPOSED LOTS – TERRACES C (65% IMPERVIOUS)
- PROPOSED PARKS (50% IMPERVIOUS)
- POINT OF COMPLIANCE — POC #
- FLOW DIRECTION
- "CLEAN" STORM DRAIN
- "DIRTY" STORM DRAIN
- SOIL TYPE B
- SOIL TYPE C
- SOIL TYPE D

NOTE:

FOR CRITICAL COARSE SEDIMENT YIELD AREAS REFERENCE ATTACHMENT 2C.

GROUNDWATER DEPTH: GREATER THAN 20'

TOWN CENTER - DMA & BMP SUMMARY							
DMA			BMP				DETAILS
ID	AREA (SF)	TYPE	ID	AREA (SF)	TYPE	MAINT. CATEGORY	
TC1	256,629	DRAINS TO BMP	TC1	6,740	BIOFILTRATION	2	A
TC2 & TCR1	381,042	DRAINS TO BMP	TC2TCR1	17,108	BIOFILTRATION	3	A
TC3	238,629	DRAINS TO BMP	TC3	12,580	BIOFILTRATION	2	A
TC4	64,466	DRAINS TO BMP	TC4	3,170	BIOFILTRATION	2	A
TC5	79,078	DRAINS TO BMP	TC5	4,200	BIOFILTRATION	2	A
TCR2	83,312	DRAINS TO BMP	TCR2	3,900	BIOFILTRATION	3	A
TCR3	405,104	DRAINS TO BMP	TCR3	20,200	BIOFILTRATION	3	A
TC6	151,577	SELF-MITIGATING	N/A	N/A	N/A	N/A	N/A
TC7	439,450	SELF-MITIGATING	N/A	N/A	N/A	N/A	N/A

NOTE: MAINTENANCE CATEGORY 3 BMPS (PUBLIC/COUNTY MAINTAINED BMPS) ARE TO BE CATEGORY 2 BMPS (HOA MAINTAINED BMPS) UNTIL CFD HAS BEEN ESTABLISHED.

SCALE: 1"=100'

GRAPHIC SCALE

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NEWLAND SIERRA
STORM WATER MANAGEMENT PLAN EXHIBIT &
HYDROMODIFICATION MANAGEMENT EXHIBIT
JANUARY 2017