Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

BDM Mixed Use

Permit Application Number:

TBD

☐ **Check if electing for offsite alternative compliance**

Engineer of Work:

Alisa S. Vialpando, PE #47945
Provide Wet Signature and Stamp Above Line

Prepared For:

BDM Investments, LLC
9523 La Jolla Farms Road
San Diego, California 92037
(858) 245-5258

Prepared By:

Hunsaker & Associates - San Diego, Inc.
9707 Waples Street
San Diego, CA 92121
(858) 558-4500

Date:

January 18, 2022

Approved by: City of San Diego Date

The City of SAN DIEGO

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Project Name: BDM Mixed Use

Table of Contents

- Attachment 3: Structural BMP Maintenance Plan
    - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

Certification Page

Project Name: BDM Mixed Use
Permit Application

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Standards. 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 source control and site design 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 the City Engineer 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.

Engineer of Work's Signature

47945 — PE#

12/31/2021 — Expiration Date

Alisa S. Vialpando

Print Name

Hunsaker & Associates - San Diego, Inc.

Company

January18, 2022

Date

Engineer's Stamp

Project Name: BDM Mixed Use

Submittal Record

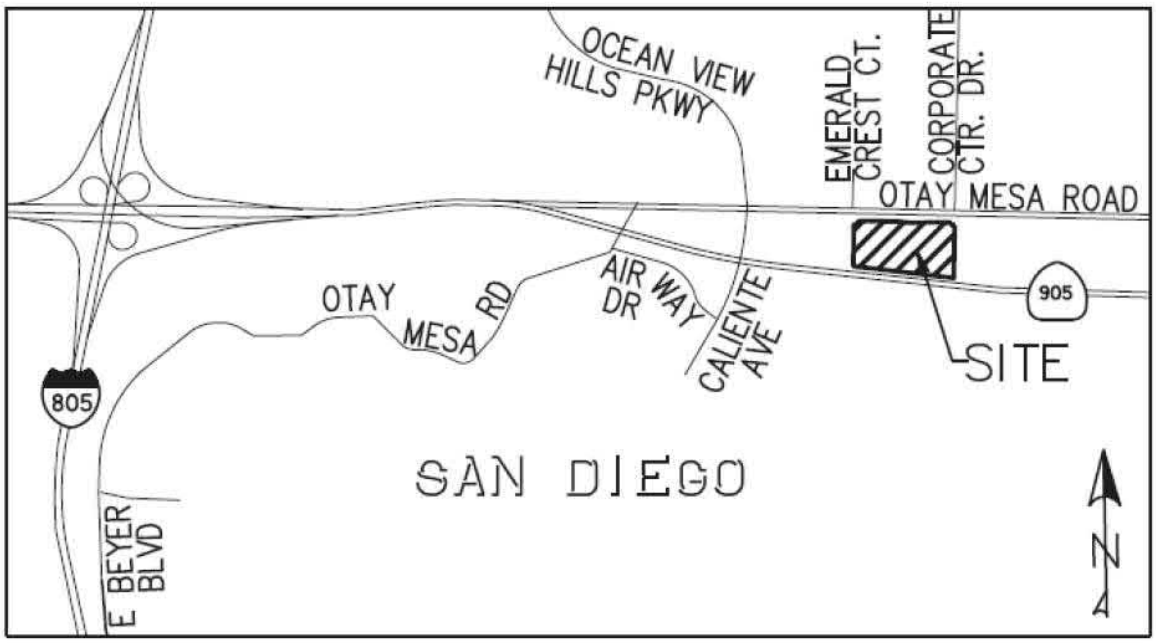
Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck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

Submittal Number	Date	Project Status	Changes
1	06/02/2021	☑ Preliminary Design/Planning/CEQA ☐ Final Design	**Initial Submittal**
2	09/28/2021	☑ Preliminary Design/Planning/CEQA ☐ Final Design	Address the City comments
3	01/18/2022	☑ Preliminary Design/Planning/CEQA ☐ Final Design	Address the City comments
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

Project Name: BDM Mixed Use

Project Vicinity Map

Project Name: BDM Mixed Use
Permit Application



VICINITY MAP

NO SCALE

City of San Diego Form DS-560 Storm Water Requirements Applicability Checklist

Attach DS-560 form.

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City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000

Storm Water Requirements Applicability Checklist

FORM
DS-560
November 2018

Project Address: 5400 Block of Otay Mesa RD, San Diego, CA 92173	Project Number: TBD

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Regional Water Quality Control Board.

For all projects complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ☒ Yes; SWPPP required, skip questions 2-4 ☐ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity resulting in ground disturbance and/or contact with storm water?

   ☐ Yes; WPCP required, skip questions 3-4 ☐ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

   ☐ Yes; WPCP required, skip question 4 ☐ No; next question

4. Does the project only include the following Permit types listed below?

   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

   ☐ Yes; no document required

Check one of the boxes below, and continue to PART B:

☒ If you checked "Yes" for question 1, **a SWPPP is REQUIRED. Continue to PART B**

☐ If you checked "No" for question 1, and checked "Yes" for question 2 or 3, **a WPCP is REQUIRED.** If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

☐ If you checked "No" for all questions 1-3, and checked "Yes" for question 4 PART B **does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/index.shtml

PART B: Determine Construction Site Priority

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ☐ **ASBS**

a. Projects located in the ASBS watershed.

2. ☒ **High Priority**

a. Projects that qualify as Risk Level 2 or Risk Level 3 per the Construction General Permit (CGP) and not located in the ASBS watershed.

b. Projects that qualify as LUP Type 2 or LUP Type 3 per the CGP and not located in the ASBS watershed.

3. ☐ **Medium Priority**

a. Projects that are not located in an ASBS watershed or designated as a High priority site.

b. Projects that qualify as Risk Level 1 or LUP Type 1 per the CGP and not located in an ASBS watershed.

c. WPCP projects (>5,000sf of ground disturbance) located within the Los Penasquitos watershed management area.

4. ☐ **Low Priority**

a. Projects not subject to a Medium or High site priority designation and are not located in an ASBS watershed.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".

If "no" is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	☐ Yes	☒ No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	☐ Yes	☒ No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	☐ Yes	☒ No

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."

If "no" was checked for all questions in Part D, continue to Part E.

1. **Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:**
   - **Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;**
   - **Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;**
   - **Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?**

   ☐ Yes; PDP exempt requirements apply ☒ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ☐ Yes; PDP exempt requirements apply ☒ No; project not exempt.

PART E: Determine if Project is a Priority Development Project (PDP).

Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F and check the box labeled "Priority Development Project".

If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Development Project".

1.	**New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☒ Yes ☐ No
2.	**Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces 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
3.	**New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.	☐ Yes ☒ No
4.	**New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.	☐ Yes ☒ No
5.	**New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	☒ Yes ☐ No
6.	**New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	☒ Yes ☐ No

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges 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). ☐ Yes ☒ No

8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ☐ Yes ☒ No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ☐ Yes ☒ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ☐ Yes ☒ No

PART F: Select the appropriate category based on the outcomes of PART C through PART E.

1. The project is **NOT SUBJECT TO PERMANENT STORM WATER REQUIREMENTS.** ☐
2. The project is a **STANDARD DEVELOPMENT PROJECT.** Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☐
3. The project is **PDP EXEMPT.** Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☐
4. The project is a **PRIORITY DEVELOPMENT PROJECT.** Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management ☒

Alisa Vialpando — President

Name of Owner or Agent *(Please Print)* — Title

Alisa S. Vialpando — 6/2/2021

Signature — Date

Applicability of Permanent, Post-Construction Storm Water BMP Requirements	Form I-1

Project Identification

Project Name: BDM Mixed Use	
Permit Application Number:	Date: 06/02/2021

Determination of Requirements

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with **Step 1** and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.

Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	Go to **Step 2**.
	☐ No	**Stop**. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):		
Step 2: Is the project a Standard Project, PDP, or PDP Exempt? To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.	☐ Standard Project	**Stop.** Standard Project requirements apply
	☑ PDP	PDP requirements apply, including PDP SWQMP. Go to **Step 3**.
	☐ PDP Exempt	**Stop.** Standard Project requirements apply. Provide discussion and list any additional requirements below.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Project Name: BDM Mixed Use

Form I-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to **Step 4**.
	☑ No	BMP Design Manual PDP requirements apply. Go to **Step 4**.
Discussion / justification of prior lawful approval, and identify requirements (not required if prior lawful approval does not apply):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to **Step 5**.
	☐ No	**Stop**. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do not apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). **Stop**.
	☑ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. **Stop**.
Discussion / justification if protection of critical coarse sediment yield areas does not apply: The project in the existing condition consists of mass graded pads and two temporary desilting basins. A " No Net Impact" analysis was performed in the approved SWQMP for Handler Commercial & Otay Mesa Road prepared by RICK Engineering Company, dated October 18, 2018; and demonstrate no net impact to the receiving water body's coarse sediment supply .		

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody.
Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

Not Applicable

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Project Name: BDM Mixed Use

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	BDM Mixed Use
Project Address	5400 Block of Otay Mesa Road, San Diego, CA 92173
Assessor's Parcel Number(s) (APN(s))	645-080-22 thru 27 & 29
Permit Application Number	TBD
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☐ Mission Bay ☐ San Diego River ☑ San Diego Bay ☑ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Water Tanks HSA (911.12) and Otay Valley HSA (910.20)
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	14.62 Acres (_____ Square Feet)
Area to be disturbed by the project (Project Footprint)	14.62 Acres (_____ Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	10.28 Acres (_____ Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	4.34 Acres (_____ Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	70.3 %

Form I-3B Page 2 of 11

Description of Existing Site Condition and Drainage Patterns

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

- ☐ Existing development
- ☐ Previously graded but not built out
- ☐ Agricultural or other non-impervious use
- ☑ Vacant, undeveloped/natural

Description / Additional Information:

The site in the existing condition consists of mass graded pads and temporary desilting basins.

Existing Land Cover Includes (select all that apply):

- ☐ Vegetative Cover
- ☑ Non-Vegetated Pervious Areas
- ☐ Impervious Areas

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:

- ☐ Groundwater Depth < 5 feet
- ☐ 5 feet < Groundwater Depth < 10 feet
- ☐ 10 feet < Groundwater Depth < 20 feet
- ☑ Groundwater Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):

- ☐ Watercourses
- ☐ Seeps
- ☐ Springs
- ☐ Wetlands
- ☑ None

Description / Additional Information:

Project Name: BDM Mixed Use

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Description of Existing Site Topography and Drainage

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. If runoff from offsite is conveyed through the site? If yes, quantification of 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 storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels;
4. Identify all discharge locations from the existing project along with a summary of the 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.

Descriptions/Additional Information

1.) The existing site consists of two mass graded pads and the existing drainage conveyance is natural. There are two points of discharge for the site in the existing and proposed condition.

2.) No Offsite runoff

3.) The existing project site drainage conveyance network consists of overland flow across mass graded pads. There is an existing storm drain headwall and storm drain ystem located to the north.

4.) The first discharge location for the project site is an existing headwall located in the northern portion of the site along Otay Mesa Road. Runoff from approximately 0.91acre of the project site and 1.81acres of street runoff from the southerly portion of Otay Mes Road is collected and conveyed north across Otay Mesa Road via an existing storm drain system. Runoff from this 0.91acre drainage area discharges into the Otay Valley Hydrologic Unit Subarea 910.20 and is ultimately conveyed to the San Diego Bay via the Otay River. Existing Q100=27.8cfs, Post-Project Q100= 26cfs. 30" RCP Storm Drain Pipe with 41 cfs capacity at outfall

The outfall at this location includes the discharge from the east portion of PA-61 and the eastern portion of Emerald Crest Road. Total area drains to this location is 13.8 ac

The second discharge location for the project site is located outside the east portion of the site between highway 905 and Otay Mesa Road. Runoff from approximately 12.76 acres of the project site and 1.1 acres of Otay Mesa Road flow in an easterly direction, and discharge into a natural canyon within Hydrologic Unit Subarea 911.12. Runoff from this 14 acre area is conveyed in a southerly direction into Mexico and ultimately to the Pacific Ocean via the

Tijuana River. Existing Q100=18.7 cfs , Post-Project Q100=17.96 cfs

36" RCP Storm Drain pipe with 33.8cfs capacity into flow spreader at outfall.

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Description of Proposed Site Development and Drainage Patterns

Project Description / Proposed Land Use and/or Activities:

This project proposes mixed use site and frontage improvements along Otay Mesa Road.

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

- Buildings
- Roadways
- Parking lots

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

- Vegetated landscape along frontage roads and throughout project footprint. - Biofiltration Basin

Does the project include grading and changes to site topography?

☑ Yes

☐ No

Description / Additional Information:

The project proposes grading within each individual lot, and the construction of streets which will border the mixed use development on the west, and east portions of the site . Biofiltration basin will be proposed within northern lot (DMA 2) for storm water management of this lot. Modular wetland system units are proposed to address water quality for the proposed streets and DMA 1 of the mixed use site. under ground Vault is sized to address the hydromodification\ detention requirements.

Project Name: BDM Mixed Use

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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 and 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.

Description / Additional Information:

This project proposes new storm water infrastructure in the form of Storm drains, inets, Biofiltration basin, under-ground vault and Modular Wetlands Systems (Proprietary Biofiltration) to provide pollutant control and hydromodification management. The vault will also provide detention for the 5, 10, 25, 50, and 100 year storms per City of San Diego requirements for flows crossing the international border to Mexico. Runoff will be collected in inlets and conveyed via a proposed storm drain system toward the historical discharge points while preserving the tributary areas from the project site to its respective major watershed. The sum of all DMA areas (1 through 6) treated within the project footprint is13.02ac including the eastern portion or Emerald Crest road which will be routed to the CMP HMP-1 and BF-3-1 on site

Area tributary to POC-2:
Runoff from the 0.63 ac of the northwestern portion of the project site (DMA 2) will be treated and detained, then conveyed to the existing
30-inch storm drain pipe flowing north across Otay Mesa Road toward the Otay Mesa Watershed. Only detention of flows for 0.1Q2 to Q10 apply for Hydromodification Management because this area will not drain toward the international border.
Street runoff from the western portion of Otay Mesa Road (ST-1) will be directed toward a vegetated swale within the proposed parkway area consistent with a Green Streets approach prior to being intercepted by a proposed curb inlet and discharged north toward the Otay Mesa Watershed

Area Tributary to POC-1:
Runoff generated from DMA-1 will be directed toward the under ground vault and a volume based MWS unit for Pollutant control, HMP, and Detention, then conveyed toward the historical discharge location at the canyon on the easterly border of the project site via a proposed storm drain system along Finn Drive. DMA4 will drain toward Modular Wetlands proprietary biofiltration system to provide Water Quality Pollutant control prior to discharging to the historical outfall location at POC-1. This total area equals 12.79 acres . This total area meets the pollutant control requirement and HMP flow control requirement when measured at POC-1. Refer to HMP analysis in attachment 2.

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Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

- [x] Onsite storm drain inlets
- [ ] Interior floor drains and elevator shaft sump pumps
- [ ] Interior parking garages
- [ ] Need for future indoor & structural pest control
- [x] Landscape/outdoor pesticide use
- [x] 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
- [x] Plazas, sidewalks, and parking lots

Description/Additional Information:

Form I-3B Page 7 of 11

Identification and Narrative of Receiving Water

Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable)

Flows discharged at the eastern portion of the site will be conveyed through a natural canyon which flows south across Interstate 905. This canyon continues in a southerly direction toward the international border where flow is intercepted via a drainage structure and conveyed into Mexico via a concrete lined system of channels and culverts prior to confluencing with the Tijuana River. The Tijuana River then flows north across the US border and out to the Pacific Ocean. Flows discharged to the North across Otay Mesa Road will discharge to a canyon location which flows toward the Otay River. The Otay River then flows in a westerly direction and discharges into the San Diego Bay.

Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations

Otay River:
MUN, AGR, IND, REC1, REC2, WARM, WILD, RARE
Tijuana River:
MUN, IND, REC1, REC2, BIOL, WARM, WILD, RARE

Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations

There are no ASBS designated areas downstream of the project discharge locations.

Provide distance from project outfall location to impaired or sensitive receiving waters

The eastern project outfall location is approximately 3 miles distance from the Tijuana River located to the southwest. The Tijuana River is listed as a 303(d) impaired water body.
The Otay River is not listed as a 303(d) impaired water body.

Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands

There is a City Multi-Habitat Planning Area located east of the project discharge point, approximately 35 feet away at its closest point to the proposed flow spreader.

Form I-3B Page 8 of 11

Identification of Receiving Water Pollutants of Concern

List any 303(d) impaired water bodies 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 (Refer to Appendix K)	Pollutant(s)/Stressor(s) (Refer to Appendix K)	TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)
Tijuana River	Eutrophic, Indicator Bacteria, Pesticides	sedimentation/siltation (wet weather)
	Low Dissolved Oxygen, Phosphorus	Turbidity (wet weather)
	Sedimentation/siltation, solids, trash	
	surfactants, synthetic organics, toxicity	
	Total Nitrogen as N, Trace elements	
	Selenium	

Identification of Project Site Pollutants*

*Identification of project site pollutants 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 anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):

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

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6)?

☑ Yes, hydromodification management flow control structural BMPs required.

☐ 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 for the watershed in which the project resides.

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

Frontage improvements along Otay Mesa Rd. will incorporate Green Street Elements to manage storm water flows from the improvement areas and storm water run-on from the existing road.

Note: If "No" answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.

Critical Coarse Sediment Yield Areas*
*This Section only required if hydromodification management requirements apply

Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint?

☐ Yes

☑ No

Discussion / Additional Information:

No CCSYA on the site in its existent conditions (mass graded pads), Please refer to the approved SWQMP For Handler Commercial & Otay Mesa Road prepared by RICK Engineering and dated October 18, 2018

Form I-3B Page 10 of 11

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.

POC-1: Located to the east of the project site, where site runoff will discharge into a natural canyon via a flow spreader. Runoff will discharge toward the Tijuana River, south of the International Border.

POC-2: Located at the proposed inlet on the northwestern portion of the project site. Runoff will discharge north to the Otay Valley watershed.

Has a geomorphic assessment been performed for the receiving channel(s)?

☑ No, the low flow threshold is $0.1Q_2$ (default low flow threshold)

☐ Yes, the result is the low flow threshold is $0.1Q_2$

☐ Yes, the result is the low flow threshold is $0.3Q_2$

☐ Yes, the result is the low flow threshold is $0.5Q_2$

If a geomorphic assessment has been performed, provide title, date, and preparer:

Discussion / Additional Information: (optional)

Form I-3B Page 11 of 11

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.

City of San Diego detention requirements (5, 10, 25, 50-year) for cross-border flows into Mexico per 1987 DSD Memo. 100-year detention is also provided because drainage infrastructure within the project site has been sized for the 100-year storm event.

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.

Project Name: BDM Mixed Use

Source Control BMP Checklist for PDPs	Form I-4B

Source Control BMPs

All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) 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 and/or Appendix E of the 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 may 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:			
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:			

Project Name: BDM Mixed Use

Form I-4B Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☑ N/A
Interior parking garages	☐ Yes	☐ No	☑ N/A
Need for future indoor & structural pest control	☐ Yes	☐ No	☑ N/A
Landscape/Outdoor Pesticide Use	☑ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☑ Yes	☐ No	☐ N/A
Food service	☐ Yes	☐ No	☑ N/A
Refuse areas	☐ Yes	☐ No	☑ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☑ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☑ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☑ N/A
Loading Docks	☐ Yes	☐ No	☑ N/A
Fire Sprinkler Test Water	☐ Yes	☐ No	☑ N/A
Miscellaneous Drain or Wash Water	☐ Yes	☐ No	☑ N/A
Plazas, sidewalks, and parking lots	☑ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive Facilities	☐ 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 all "No" answers shown above.			

Project Name: BDM Mixed Use

Site Design BMP Checklist for PDPs	Form I-5B

Site Design BMPs

All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) 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 and/or Appendix E of the 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 may be provided.

A site map with implemented site design BMPs must be included at the end of this checklist.

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:			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☑ Yes	☐ No	☐ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☑ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.2 not implemented:			

The project proposes the mixed use development of mass graded pad. Per the Exhibits in Attachment 2, this land cover is currently classified as non-native vegetation which is listed as "least sensitive" in Chapter 4 of the SWSM.

Project Name: BDM Mixed Use

Form I-5B Page 2 of 4			
Site Design Requirement	**Applied?**		
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:			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☑ No	☐ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☐ No	☑ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Project Name: BDM Mixed Use

Form I-5B Page 3 of 4			
Site Design Requirement	**Applied?**		
4.3.6 Runoff Collection	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.6 not implemented:			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
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 Harvest and Use Precipitation	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.8 not implemented:			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Project Name: BDM Mixed Use

Form I-5B Page 4 of 4
Insert Site Map with all site design BMPs identified:

Refer to DMA Exhibit located in Attachment 1

Project Name: BDM Mixed Use

Summary of PDP Structural BMPs	Form I-6

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). 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 City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 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.

Infiltration BMPs were deemed infeasible due to underlying soils which are not conducive to infiltration practices as stated in the Geotechnical report prepared by Geocon.
Bioretention BMPs were not selected due to the low infiltration potential of underlying soils.
Biofiltration BMPs (Bioretention with underdrain) and an underground vault were selected as the most feasible solution to provide storm water pollutant control, hydromodification management, and detention of flows across a spectrum of return periods including the 2-10 year flows from hydromodification management measures, 25-year, 50-year, and 100-year storm events, prior to discharging to the historical outfall locations.
One volume based Modular Wetland unit (BF-3-1) is proposed as a proprietary biofiltration BMP to treat the proposed mixed use site. One Modular Wetland units BF-3-4 is proposed as a proprietary biofiltration BMPs to treat the proposed public street on the east portion of the project. A proprietary BMP was selected due to site constraints (the site is very flat). This unit has been sized to provide Pollutant Control Only. The underground vault (HMP-1) has been sized to provide additional hydromodification flow control and mitigate impact from the DMA served by BF-3-4.

(Continue on page 2 as necessary.)

Project Name: BDM Mixed Use

Form I-6 Page 2 of
(Continued from page 1)

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BF-3-1	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ 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) ☐ 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 form DS-563	TBD
Who will be the final owner of this BMP?	Land owner, BDM Investments, LLC A separate owner may be identified during final development of individual lots.
Who will maintain this BMP into perpetuity?	Land owner, BDM Investments, LLC A separate owner may be identified during final development of individual lots.
What is the funding mechanism for maintenance?	Owner will provide on-going maintenance funding.

Project Name: BDM Mixed Use

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BF-3-1
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): A Modular Wetland (BF-3-1) is proposed for pollutant control only. Hydromodification flows from the project site DMA 1 are addressed via the Vault (HMP-1) on the Mixed use develpment

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BF-1-2	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ 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) ☐ 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 form DS-563	TBD
Who will be the final owner of this BMP?	Land owner, BDM Investments, LLC A separate owner may be identified during final de
Who will maintain this BMP into perpetuity?	Land owner, BDM Investments, LLC A separate owner may be identified during final de
What is the funding mechanism for maintenance?	Owner will provide on-going maintenance funding.

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BF-1-2
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): A Biofiltration Basin is proposed for pollutant control, Hydromodification management, and detention purposes.

Project Name: BDM Mixed Use

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BF-3-4	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ 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) ☐ 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 form DS-563	TBD
Who will be the final owner of this BMP?	City of San Diego Department of Transportation and Stormwater.
Who will maintain this BMP into perpetuity?	City of San Diego Department of Transportation and Stormwater.
What is the funding mechanism for maintenance?	Owner will provide on-going maintenance funding.

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BF-3-4
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): A Modular Wetland (BF-3-4) is proposed for pollutant control only. Hydromodification flows from the project site DMA 4 are addressed via over detaining in the Vault (HMP-1) on the Mixed use development

Project Name: BDM Mixed Use

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. HMP-1	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ 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) ☐ 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 form DS-563	TBD
Who will be the final owner of this BMP?	Land owner, BDM Investments, LLC A separate owner may be identified during final development of individual lots.
Who will maintain this BMP into perpetuity?	Land owner, BDM Investments, LLC A separate owner may be identified during final development of individual lots.
What is the funding mechanism for maintenance?	Owner will provide on-going maintenance funding.

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. HMP-1
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): The HMP-1 underground vault was sized to address Hydromodification flows from the project site DMA 1, DMA 3 and DMA 4

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Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

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Project Name: BDM Mixed Use

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☐ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A (optional) ○ Form I-8B (optional) • Partial Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A ○ Form I-8B • Full Infiltration Condition: ○ Form I-8A ○ Form I-8B ○ Worksheet C.4-3 ○ Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	☑ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

Project Name: BDM Mixed Use

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

The DMA Exhibit must identify:

- [x] Underlying hydrologic soil group
- [x] Approximate depth to groundwater
- [x] Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- [ ] Critical coarse sediment yield areas to be protected
- [x] Existing topography and impervious areas
- [x] Existing and proposed site drainage network and connections to drainage offsite
- [x] Proposed grading
- [x] Proposed impervious features
- [x] Proposed design features and surface treatments used to minimize imperviousness
- [x] 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)
- [x] Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- [x] Structural BMPs (identify location, type of BMP, size/detail, and include cross-section)

Attachment 1A

LEGEND

- PROJECT BOUNDARY
- DMA BOUNDARY
- 00.00 ACRES — SUBAREA ACREAGE
- DMA 1 — DMA ICON
- IMPERVIOUS - ROAD
- IMPERVIOUS - SIDEWALK
- IMPERVIOUS - ROOF
- PERVIOUS - LANDSCAPE ONSITE
- SELF-RETAINING
- SELF-MITIGATION AREA/PERVIOUS
- D — HYDROLOGIC SOIL TYPE
- 1 — POINT OF COMPLIANCE
- STRUCTURAL BMP
- GSE - XX - # — GREEN STREETS ELEMENTS ID (GSE)
  STREET TREES (ST)
  VEGETATED SWALES (VS)
- VEGETATED SWALE
- BIOFILTRATION BASIN BOTTOM AREA
- UNDERGROUND CMP STORAGE = 54589 CFT

SITE DESIGN BMPs

SD-1 MAINTAIN NATURAL HYDROLOGIC FEATURES
SD-2 CONSERVE NATURAL AREAS, SOILS, VEGETATION
SD-3 MINIMIZE IMPERVIOUS AREAS
SD-4 MINIMIZE SOIL COMPACTION
SD-5 IMPERVIOUS AREA DISPERSION
SD-6 RUNOFF COLLECTION
SD-7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES
SD-8 HARVESTING AND USING PRECIPITATION

SOURCE CONTROL BMPs

SC-1 PREVENTION OF ILLICIT DISCHARGES TO MS4
SC-2 STORM DRAIN STENCILING OR SIGNAGE
SC-3 PROTECT OUTDOOR MATERIAL STORAGE AREAS
SC-4 PROTECT MATERIALS STORED IN OUTDOOR WORK AREAS
SC-5 PROTECT TRASH STORAGE AREAS
SC-6 ADDITIONAL BMPS BASED ON POTENTIAL SOURCES OF RUNOFF POLLUTANTS
- SC-6A ON-SITE STORM DRAIN INLETS
- SC-6B INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS
- SC-6C INTERIOR PARKING GARAGES
- SC-6D NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- SC-6E LANDSCAPE/OUTDOOR PESTICIDE USE
- SC-6F POOLS, SPAS, PONDS, FOUNTAINS, AND OTHER WATER FEATURES
- SC-6G FOOD SERVICE
- SC-6H REFUSE AREA
- SC-6I INDUSTRIAL PROCESSES
- SC-6J OUTDOOR STORAGE OF EQUIPMENT OR MATERIALS
- SC-6K VEHIVLE AND EQUIPMENT CLEANING
- SC-6L VEHICLE/EQUIPMENT REPAIR AND MAINTENANCE
- SC-6M FUEL DISPENSING AREA
- SC-6N LOADING DOCKS
- SC-6O FIRE SPRINKLER TEST WATER
- SC-6P MISCELLANEOUS DRAIN OR WASH WATER
- SC-6Q PLAZAS, SIDEWALKS, AND PARKING LOTS

UNDERLYING SOIL GROUP : D
APPROXIMATE DEPTH TO GROUNDWATER > 20'
NO CRITICAL COARSE AREAS REQUIRE PRESERVATION

BDM MIXED USE		Proprietary Biofiltration BF-3						Biofiltration BF-1		Self-mitigating		GREEN STREET			
DMA Calculations		DMA 1-A	DMA 1-B	DMA 1	BF-3-1	DMA 4	BF-3-4	DMA 2	BF-1-2	DMA 3		ST-1		ST-2	
	Runoff Factor	Area (s.f.)	Area (s.f.)	Area (s.f.)	S RF x A	Area (s.f.)	S RF x A	Area (s.f.)	S RF x A	Area (s.f.)	S RF x A	Area (s.f.)	S RF x A	Area (s.f.)	S RF x A
Roofs	0.90	135815	0	135815	122234	0	0	14430	12987	0	0	0	0	0	0
Concrete or Asphal	0.90	227311	19344	246655	221989	23357	21021	2460	2214	0	0	9067	8160	15947	14353
Biofiltration Basin	0.10	0	0	0	0	0	0	2280	228	0	0	0		0	
Landscape	0.30	134331	4423	138754	41626	12601	3780	8112	2433	10127	3038	3985	1196	13156	3947
Total		497458	23766	521224	385849	35958	24802	27282	17863	10127	3038	13052	9356	29104	18299
				C=	0.74	C=	0.69	C=	0.65	NA		C=	0.72	C=	0.63

PREPARED BY:
HUNSAKER & ASSOCIATES SAN DIEGO, INC.
PLANNING 9707 Waples Street
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PROPOSED
DRAINAGE MAP

BDM MIXED USE

CITY OF SAN DIEGO, CALIFORNIA

MAP 1 OF 2

W.O.#

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PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20 & HS25
- APPROX. LINEAR FOOTAGE = 1,232 lf.

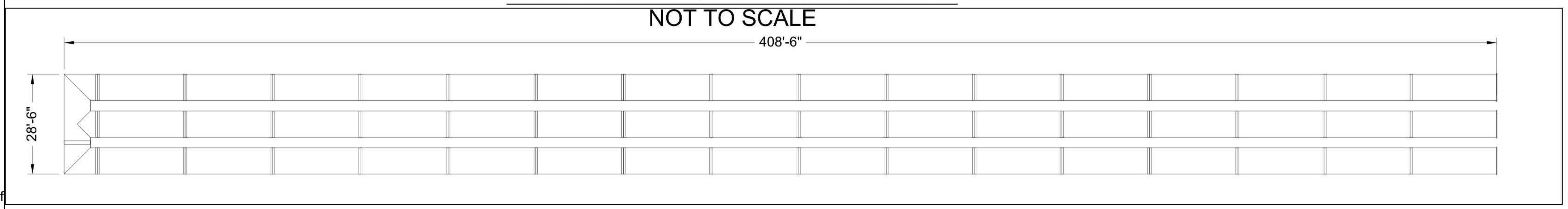
STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = N/A
- PIPE STORAGE VOLUME = 54,406 cf.
- BACKFILL STORAGE VOLUME = 183 cf.
- TOTAL STORAGE PROVIDED = 54,589 cf

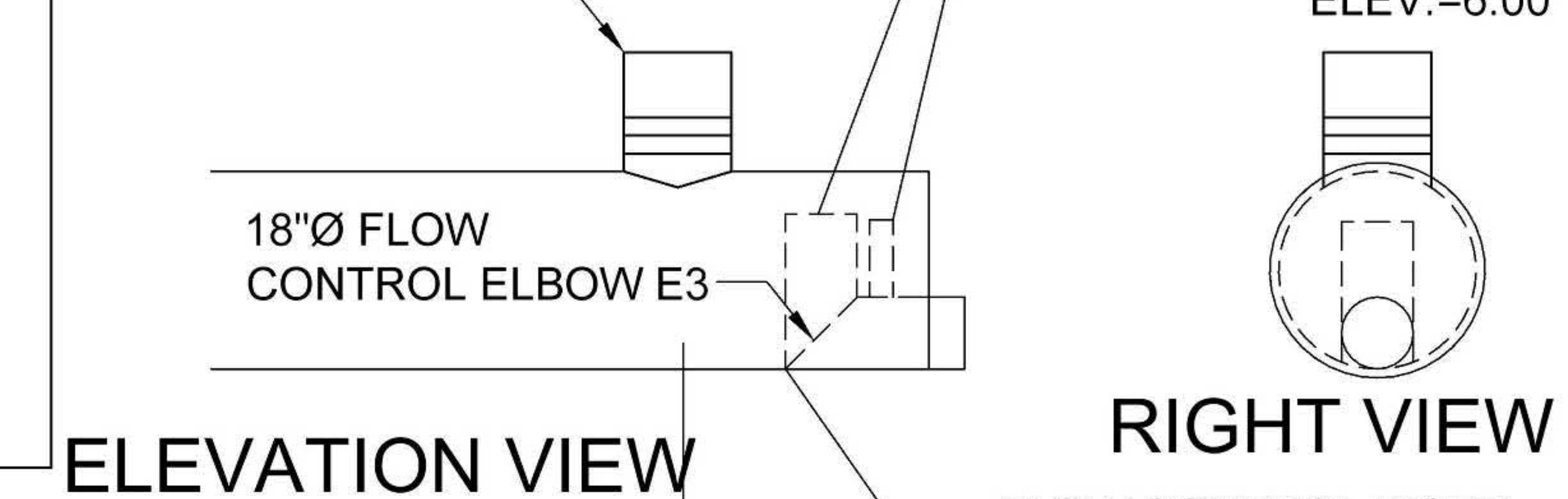
PIPE DETAILS
- DIAMETER = 90 IN.
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = Perforated
- BARRELL SPACING = 36 IN.

BACKFILL DETAILS
- WIDTH AT ENDS = 12 IN.
- ABOVE PIPE = 6 IN.
- WIDTH AT SIDES = 12 IN.
- BELOW PIPE = 0 IN.

HMP-1 CMP STORAGE DETAIL

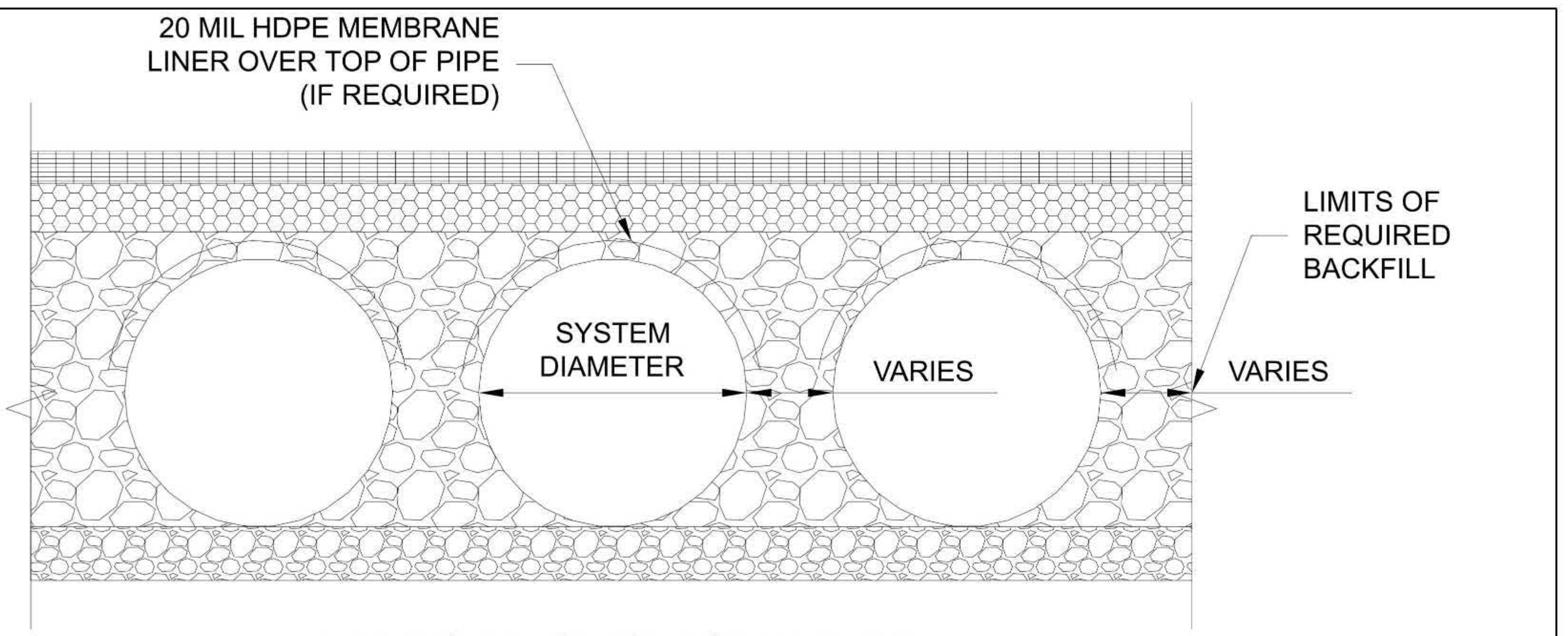
NOT TO SCALE





RISER/WEIR DETAIL

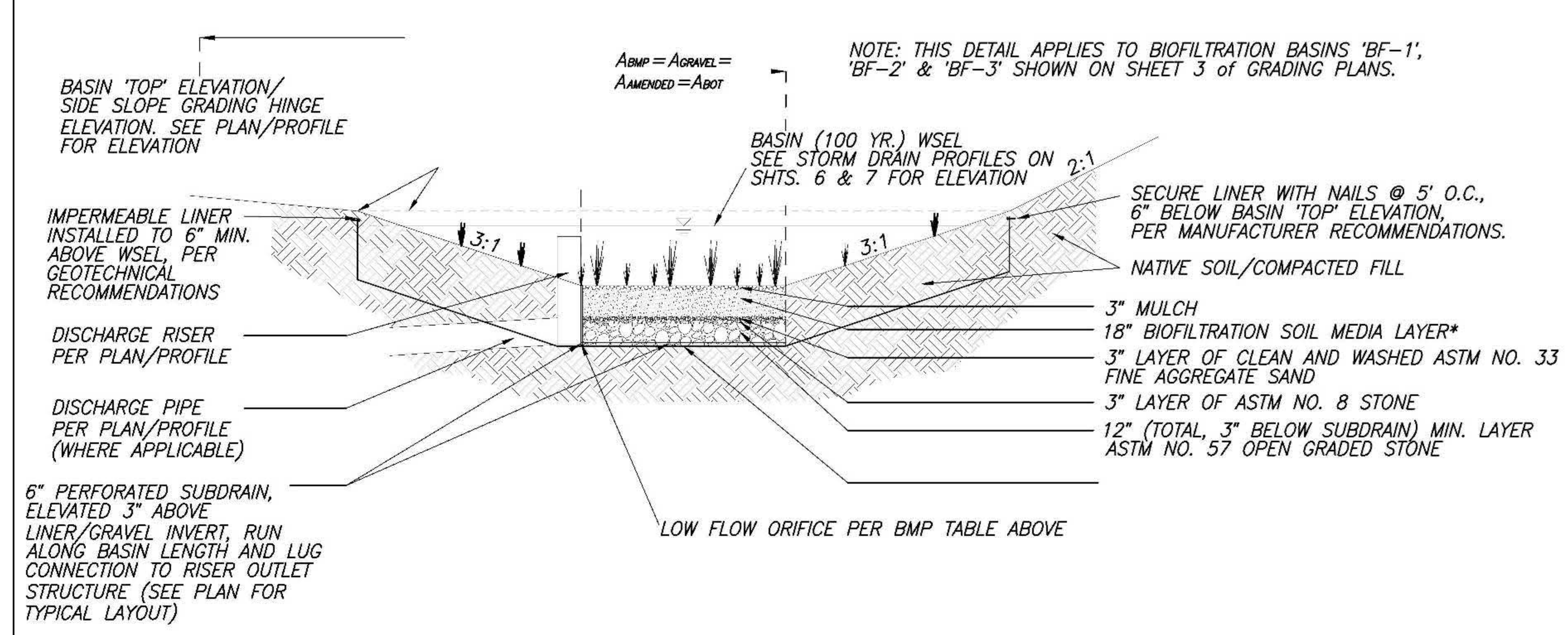
NOT TO SCALE



TYPICAL SECTION VIEW

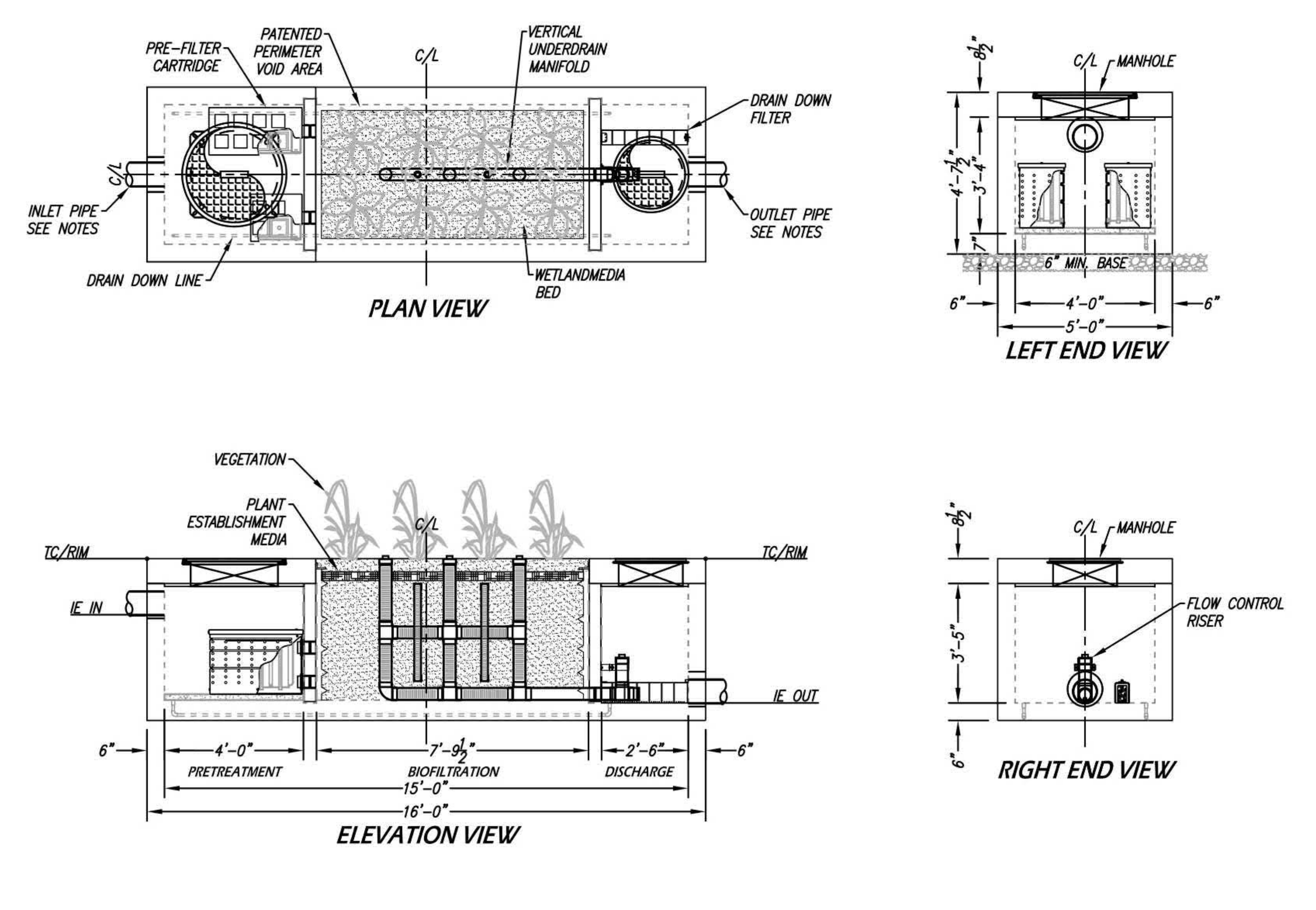
LINER OVER ROWS
SCALE: N.T.S.

NOTE: IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, AN HDPE MEMBRANE LINER IS RECOMMENDED WITH THE SYSTEM. THE IMPERMEABLE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.



SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE



TREATMENT FLOW (CFS)	0.175
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

PROPRIETARY AND CONFIDENTIAL:

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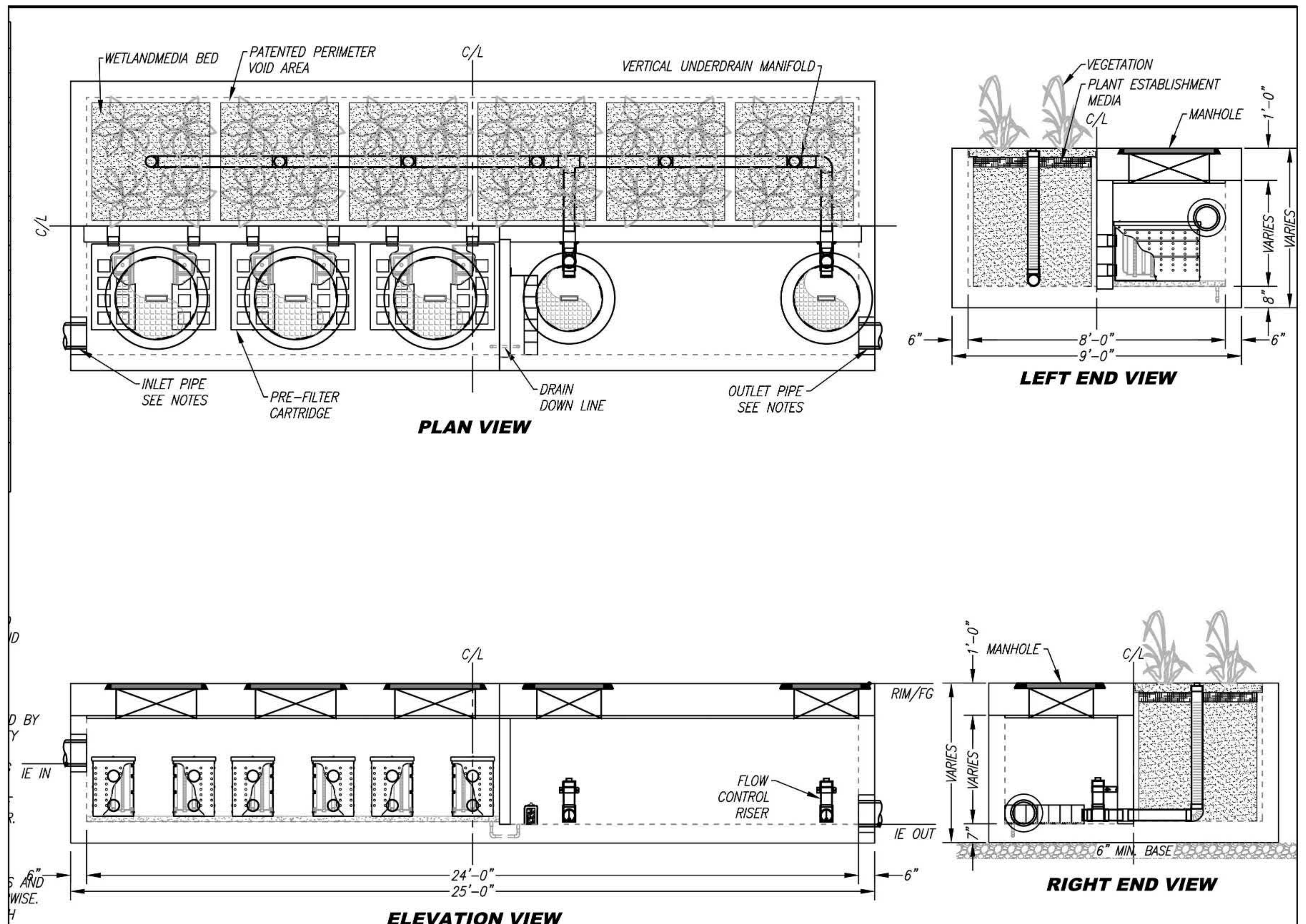
MODULAR WETLANDS

MWS-L-4-15-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL



TREATMENT FLOW (CFS)	0.693
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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Bio Clean
A Forterra Company

MWS-L-8-24-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

PREPARED BY:

HUNSAKER & ASSOCIATES
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PROPOSED
DRAINAGE MAP

BDM MIXED USE

CITY OF SAN DIEGO, CALIFORNIA

MAP 2 OF 2

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W.O.# ____-____

Attachment 1B

Project Name: BDM Mixed Use

Tabular Summary of DMAs									Worksheet B-1
DMA Unique Identifier	Area (acres)	Impervious Area (acres)	% Imp	HSG	Area Weighted Runoff Coefficient	DCV (cubic feet)	Treated By (BMP ID)	Pollutant Control Type	Drains to (POC ID)
DMA 1	11.97	8.78	73	D	0.74	16077	BF-3-1	Proprietary BF	1
DMA 2	0.63	0.39	62	D	0.65	744	BF-1-2	Biofiltration	2
DMA 3	0.23	0	0	D		NA	NA	Self Mitigating	1
DMA 4	0.83	0.54	65	D	0.69	1033	BF-3-4	Proprietary BF	1

DMA 1-A + DMA 1-B

Summary of DMA Information (Must match project description and SWQMP Narrative)									
No. of DMAs	Total DMA Area (acres)	Total Impervious Area (acres)	% Imp		Area Weighted Runoff Coefficient	Total DCV (cubic feet)	Total Area Treated (acres)		No. of POCs
4	13.65	9.7	71		0.73	17855	13.42		2

Where: DMA = Drainage Management Area; Imp = Imperviousness; HSG = Hydrologic Soil Group; DCV= Design Capture Volume; BMP = Best Management Practice; POC = Point of Compliance; ID = identifier; No. = Number

Attachment 1C

Harvest and Use Feasibility Checklist	Worksheet B.3-1 : Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☑ Toilet and urinal flushing
☑ Landscape irrigation
☐ Other:_____

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
[Provide a summary of calculations here]

Land use: Residential. 36 hr:0.5* 14GAL/Resident *2Resident/Unit *150Units=2100 gal=> 280 cubic feet

Office/Retail Toilet use - 7 gallons/Day x 1.5 x 100 users = 1050 gallons. Approximately 140 cu. ft.

General Landscape: Moderate plant use. 1880 gal/ac * 4.44 ac= 8,354 gal => 1117 cf

Total = 1,537 cf

3. Calculate the DCV using worksheet B-2.1.
DCV = 17855 (cubic feet)
[Provide a summary of calculations here]
Total area = 13.42 ac
Total DCV= 17855 cft
0.25DCV= 4464 cft

3a. Is the 36-hour demand greater than or equal to the DCV?	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36-hour demand less than 0.25DCV?
☐ Yes ⇩ / ☑ No ⇨	☐ Yes ⇩ / ☑ No ⇨	☑ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?
☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☑ No, select alternate BMPs.

Attachment 1D

Project No. G1933-42-02
January 10, 2018

Dr. Gerald Handler
9523 La Jolla Farms Road
La Jolla, California 92031

Subject: INFILTRATION FEASIBILITY CONDITION LETTER
HANDLER COMMERCIAL
DRAWING NO. 39191-19-D
OTAY MESA ROAD AND CORPORATE CENTER DRIVE
SAN DIEGO, CALIFORNIA

References:
1. *Update Geotechnical Investigation, Handler Commercial, Drawing No. 39191-19-D, Otay Mesa Road and Corporate Center Drive, San Diego, California*, prepared by Geocon Incorporated, dated December 29, 2017 (Project No. G1933-42-02).
2. *Grading Plans for Handler Commercial and Otay Mesa Road, Drawing No. 39191-19-D,* prepared by Rick Engineering Company, received via email December 20, 2017.

Dear Dr. Handler:

We prepared this letter supporting a *No Infiltration* condition for the Handler Commercial development project located in the Otay Mesa area in the City of San Diego.

Site Description

The site consists of a 13-acre parcel located on the south side of Otay Mesa Road, between Emerald Crest Court and Corporate Center Drive, in the west section of the Otay Mesa area of San Diego, California. The rectangular-shaped site is bordered to the north by Otay Mesa Road, to the west by a future residential development, to the south by Interstate 905 Right-of-Way and to the east by an open space area. Existing improvements consist of underground lines along Otay Mesa Road.

The site is relatively flat, sloping toward the east, from an approximate elevation of 520 feet above Mean Sea Level (MSL) at the west end to an approximate elevation of 502 feet MSL at the east section.

We understand that project development will consist of grading the site to construct five sheet-graded lots; six detention basins; and Streets A, B and C. We anticipate that the lots will be regraded at a later time once specific site plans are developed. Developed areas in the vicinity of the site consist of paved roads, commercial and residential buildings.

Previous Geotechnical Studies

Geocon prepared an updated geotechnical report in 2017 as part of the preliminary planning/design phase of development. As part of the present letter, we reviewed USDA Web Soil Survey mapping for

the project site. The soil survey identified the majority of the site as being underlain by Stockpen gravelly clay loam, 2 to 5 percent slopes. The soil survey was consistent with previous geotechnical trenches excavated at the site. The USDA website defines the Stockpen gravelly clay loam as Hydrologic Soil Group D with a saturated hydraulic conductivity (Ksat) rate of 0.00 to 0.06 inches/ hour is estimated for the site. After applying a factor of safety of 2, a feasibility soil infiltration rate of 0.03 inches/hour is estimated for the site. The estimated infiltration rate is less than 0.05 inches/hour and is defined as a *No Infiltration* condition in accordance with Appendix C with the 2017 *Storm Water Standards* (SWS).

The site is blanketed by a clay layer (topsoil) with a thickness varying from 1 to 4 feet underlying by a 3 to 8 feet thick layer of very clayey gravelly sand of the Very Old Paralic Deposits. Infiltration tests performed in the area with similar geotechnical conditions yielded infiltration rates of less than 0.05 inches/hour. Other geologic units are not present on the property that would possess an infiltration rate of greater than 0.05 inches/hour.

Storm Water Design Narrative

We performed our site reconnaissance and background research for the subject property to evaluate potential areas of infiltration. We also reviewed infiltration tests in the area to help evaluate if there are areas where infiltration may be possible. We focused our studies in nearby projects. We also focused our analyses in areas where the formational materials are present near grade.

Conclusion

Based on the results of our research, the existing geologic units on the property, and infiltration test results performed in the area, it does not appear that the site conditions possess an opportunity for full and partial infiltration. Therefore, the property should be considered to possess a *No Infiltration* condition in accordance with Appendix C of the 2017 SWS.

If you have any questions regarding this letter, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Raul R. Garcia
GE 2842

RRG:GWC:dmc

Attachment: Worksheet C.4-1: Form I-8A

(1) Addressee
(1) Rick Engineering Company
Attention: Mr. Phay Thammavong

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]
Part 1 - Full Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		Project Phase:
Handler Commercial		G1933-42-02
Criteria 1: Infiltration Rate Screening		
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[11]? ☐Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ☐No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ☐No; the mapped soil types are C, D, or "urban/unclassified" and is corroborated by available site soil data. Answer "No" to Criteria 1 Result. ☑No; the mapped soil types are C, D, or "urban/unclassified" but is not corroborated by available site soil data (continue to Step 1B).	
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ☑Yes; Continue to Step 1C. ☐No; Skip to Step 1D.	
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour? ☐Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result. ☑No; full infiltration is not required. Answer "No" to Criteria 1 Result.	
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ☐Yes; continue to Step 1E. ☐No; select an appropriate infiltration testing method.	

Note that it is not required to investigate each and every criterion in the worksheet, a single "no" answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition.

[10] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

[11] Available data includes site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[10]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ☐Yes; continue to Step 1F. ☐No; conduct appropriate number of tests.
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9). ☐Yes; continue to Step 1G. ☐No; select appropriate factor of safety.
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ☐Yes; answer "Yes" to Criteria 1 Result. ☐No; answer "No" to Criteria 1 Result.
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ☐Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ☑No; full infiltration is not required. Skip to Part 1 Result.

Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report.

Based on the Natural Resources Conservation Services Soil Survey Maps, the infiltration rate varies from 0.00 to 0.06 inches/hour. After applying a factor of safety of 2, the estimated infiltration rate is 0.03 inches/hour.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 2: Geologic/Geotechnical Screening			
2A	If all questions in Step 2A are answered "Yes," continue to Step 2B. For any "No" answer in Step 2A answer "No" to Criteria 2, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
2A-1	Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface?	☐Yes	☐No
2A-2	Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐Yes	☐No
2A-3	Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐Yes	☐No
2B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 2B are answered "Yes," then answer "Yes" to Criteria 2 Result. If there are "No" answers continue to Step 2C.		
2B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐Yes	☐No
2B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐Yes	☐No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐Yes	☐No
2B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐Yes	☐No
2B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐Yes	☐No
2B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered "Yes," then answer "Yes" to Criteria 2 Result. If the question in Step 2C is answered "No," then answer "No" to Criteria 2 Result.	☐Yes	☐No
Criteria 2 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐Yes	☐No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 1 Result – Full Infiltration Geotechnical Screening [12]	Result
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	☐Full infiltration Condition ☑Complete Part 2

[12] 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 City Engineer to substantiate findings.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		Project Phase:
Handler Commercial		G1933-42-02
Criteria 3 : Infiltration Rate Screening		
3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ☐ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☐ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☑ No; infiltration testing is conducted (refer to Table D.3-1), continue to Step 3B.	
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ☐ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ☑ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.	
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ☐ Yes; Continue to Criteria 4. ☑ No: Skip to Part 2 Result.	
Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate).		

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 2B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A-1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	☐Yes	☐No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐Yes	☐No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐Yes	☐No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1 If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐Yes	☐No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐Yes	☐No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐Yes	☐No
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐Yes	☐No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐Yes	☐No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	☐Yes	☐No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	☐Yes	☐No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No

Summarize findings and basis; provide references to related reports or exhibits.

Part 2 – Partial Infiltration Geotechnical Screening Result[13]	Result
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	☐ Partial Infiltration Condition ☑ No Infiltration Condition

[13] 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 City Engineer to substantiate findings.

Attachment 1E

DMA 1-A + DMA-1-B

DMA Calculations		DMA 1-A	DMA 1-B	DMA 1	BF-3-1	DMA 4	BF-3-4	DMA 2	BF-1-2	DMA 3		ST-1		ST-2	
	Runoff Factor	Area (s.f.)	Area (s.f.)	Area (s.f.)	**S** RF x A	Area (s.f.)	**S** RF x A	Area (s.f.)	**S** RF x A	Area (s.f.)	**S** RF x A	Area (s.f.)	**S** RF x A	Area (s.f.)	**S** RF x A
Roofs	0.90	135815	0	135815	122234	0	0	14430	12987	0	0	0	0	0	0
Concrete or Asphalt	0.90	227311	19344	246655	221989	23357	21021	2460	2214	0	0	9067	8160	15947	14353
Biofiltration Basin	0.10	0	0	0	0	0	0	2280	228	0	0	0		0	
Landscape	0.30	134331	4423	138754	41626	12601	3780	8112	2433	10127	3038	3985	1196	13156	3947
Total		497458	23766	521224	385849	35958	24802	27282	17863	10127	3038	13052	9356	29104	18299
				C=	0.74	C=	0.69	C=	0.65	NA		C=	0.72	C=	0.63
Total imp				8.78		0.54		0.39							
imp%				73.38%		64.96%		61.91%		0.00%					

DMA-1

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.50	inches
2	Area tributary to BMP (s)	A=	11.97	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.74	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	16077	cubic-feet

1.5 DCV = 24,116 cft

Volume Based Sizing

36 Hr

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down		Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	1710	2280
MWS-L-4-6	1600	2400	3200
MWS-L-4-8	2518	3777	5036
MWS-L-4-13	3131	4696	6261
MWS-L-4-15	3811	5716	7623
MWS-L-4-17	4492	6738	8984
MWS-L-4-19	5172	7758	10345
MWS-L-4-21	5853	8779	11706
MWS-L-6-8	3191	4786	6382
MWS-L-8-8	5036	7554	10072
MWS-L-8-12	7554	11331	15109
MWS-L-8-16	10073	15109	20145
MWS-L-8-20	12560	18840	25120
MWS-L-8-24	15108	22662	30216
MWS-L-8-24 3.6' HGL		24,155	

HMP-1 (90" CMP Underground Storage)

Stage Storage HMP-1 CMP (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
0.00	0	0.000000	1830
0.02	37	0.000840	1830
0.04	73	0.001680	1830
0.06	110	0.002520	1830
0.08	146	0.003360	1830
0.10	183	0.004200	1830
0.12	220	0.005041	1830
0.14	256	0.005881	1830
0.16	293	0.006721	1830
0.17	311	0.007141	1830
0.18	345	0.007922	1917
0.20	413	0.009485	2066
0.22	481	0.011048	2188
0.24	549	0.012611	2289
0.26	617	0.014174	2375
0.28	686	0.015737	2448
0.30	754	0.017300	2512
0.32	822	0.018863	2568
0.33	867	0.019905	230
0.34	895	0.020556	2634
0.36	981	0.022511	2724
0.38	1066	0.024465	2804
0.40	1151	0.026419	2877
0.42	1236	0.028374	2943
0.44	1321	0.030328	3002
0.46	1406	0.032282	3057
0.48	1491	0.034237	3107
0.50	1576	0.036191	3153
0.52	1674	0.038429	3219
0.54	1771	0.040668	3281
0.56	1869	0.042906	3337
0.58	1966	0.045145	3391
0.60	2064	0.047383	3440
0.62	2162	0.049621	3486
0.64	2259	0.051860	3530
0.66	2357	0.054098	3570
0.67	2405	0.055217	3590
0.68	2462	0.056521	3621
0.70	2576	0.059129	3680
0.72	2689	0.061737	3735
0.74	2803	0.064344	3788
0.76	2916	0.066952	3837
0.78	3030	0.069560	3885
0.80	3144	0.072168	3930
0.82	3257	0.074776	3972
0.83	3333	0.076514	4000
0.84	3373	0.077444	4016
0.86	3495	0.080232	4064
0.88	3616	0.083021	4110
0.90	3738	0.085810	4153
0.92	3859	0.088598	4195
0.94	3981	0.091387	4235
0.96	4102	0.094176	4273
0.98	4224	0.096964	4310
1.00	4345	0.099753	4345
1.02	4476	0.102745	4388
1.04	4606	0.105736	4429
1.06	4736	0.108728	4468
1.08	4866	0.111719	4506
1.10	4997	0.114711	4543
1.12	5127	0.117703	4578
1.14	5257	0.120694	4612
1.16	5388	0.123686	4645

Stage Storage HMP-1 CMP (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
1.17	5431	0.124683	4655
1.18	5523	0.126797	4681
1.20	5661	0.129967	4718
1.22	5799	0.133137	4754
1.24	5938	0.136308	4788
1.26	6076	0.139478	4822
1.28	6214	0.142648	4855
1.30	6352	0.145819	4886
1.32	6490	0.148989	4917
1.33	6582	0.151103	4937
1.34	6630	0.152212	4948
1.36	6775	0.155541	4982
1.38	6920	0.158870	5015
1.40	7065	0.162199	5047
1.42	7210	0.165527	5078
1.44	7355	0.168856	5108
1.46	7500	0.172185	5137
1.48	7645	0.175514	5166
1.50	7790	0.178843	5194
1.52	7942	0.182312	5225
1.54	8093	0.185782	5255
1.56	8244	0.189252	5284
1.58	8395	0.192722	5313
1.60	8546	0.196191	5341
1.62	8697	0.199661	5369
1.64	8848	0.203131	5395
1.66	9000	0.206601	5421
1.67	9050	0.207757	5430
1.68	9154	0.210154	5449
1.70	9311	0.213749	5477
1.72	9468	0.217345	5504
1.74	9624	0.220940	5531
1.76	9781	0.224535	5557
1.78	9937	0.228130	5583
1.80	10094	0.231726	5608
1.82	10251	0.235321	5632
1.83	10355	0.237718	5648
1.84	10409	0.238954	5657
1.86	10570	0.242661	5683
1.88	10732	0.246368	5708
1.90	10893	0.250075	5733
1.92	11055	0.253782	5758
1.94	11216	0.257489	5782
1.96	11378	0.261196	5805
1.98	11539	0.264903	5828
2.00	11701	0.268610	5850
2.02	11866	0.272416	5874
2.04	12032	0.276222	5898
2.06	12198	0.280028	5921
2.08	12364	0.283835	5944
2.10	12530	0.287641	5966
2.12	12695	0.291447	5988
2.14	12861	0.295253	6010
2.16	13027	0.299059	6031
2.17	13082	0.300328	6038
2.18	13195	0.302924	6053
2.20	13365	0.306817	6075
2.22	13535	0.310711	6097
2.24	13704	0.314605	6118
2.26	13874	0.318498	6139
2.28	14043	0.322392	6159
2.30	14213	0.326286	6180
2.32	14383	0.330179	6199

Stage Storage HMP-1 CMP (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
2.33	14496	0.332775	6212
2.34	14553	0.334099	6219
2.36	14726	0.338069	6240
2.38	14899	0.342039	6260
2.40	15072	0.346009	6280
2.42	15245	0.349980	6300
2.44	15418	0.353950	6319
2.46	15591	0.357920	6338
2.48	15764	0.361891	6356
2.50	15937	0.365861	6375
2.52	16113	0.369898	6394
2.54	16289	0.373934	6413
2.56	16464	0.377971	6431
2.58	16640	0.382008	6450
2.60	16816	0.386045	6468
2.62	16992	0.390081	6485
2.64	17168	0.394118	6503
2.66	17344	0.398155	6520
2.67	17402	0.399500	6526
2.68	17521	0.402229	6538
2.70	17699	0.406323	6555
2.72	17878	0.410416	6573
2.74	18056	0.414509	6590
2.76	18234	0.418603	6607
2.78	18413	0.422696	6623
2.80	18591	0.426790	6640
2.82	18769	0.430883	6656
2.83	18888	0.433612	6666
2.84	18948	0.434992	6672
2.86	19129	0.439133	6688
2.88	19309	0.443274	6705
2.90	19489	0.447414	6720
2.92	19670	0.451555	6736
2.94	19850	0.455696	6752
2.96	20030	0.459837	6767
2.98	20211	0.463977	6782
3.00	20391	0.468118	6797
3.02	20573	0.472297	6812
3.04	20755	0.476476	6827
3.06	20937	0.480656	6842
3.08	21119	0.484835	6857
3.10	21301	0.489014	6871
3.12	21483	0.493193	6886
3.14	21666	0.497372	6900
3.16	21848	0.501551	6914
3.17	21908	0.502944	6918
3.18	22030	0.505750	6928
3.20	22214	0.509958	6942
3.22	22397	0.514167	6956
3.24	22580	0.518376	6969
3.26	22764	0.522584	6983
3.28	22947	0.526793	6996
3.30	23130	0.531002	7009
3.32	23314	0.535210	7022
3.33	23436	0.538016	7031
3.34	23497	0.539426	7035
3.36	23682	0.543656	7048
3.38	23866	0.547885	7061
3.40	24050	0.552115	7074
3.42	24234	0.556345	7086
3.44	24419	0.560574	7098
3.46	24603	0.564804	7111
3.48	24787	0.569034	7123

WQ Volume

Stage Storage HMP-1 CMP (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
3.50	24971	0.573263	7135
3.52	25156	0.577506	7147
3.54	25341	0.581748	7158
3.56	25526	0.585990	7170
3.58	25711	0.590232	7182
3.60	25895	0.594474	7193
3.62	26080	0.598717	7204
3.64	26265	0.602959	7216
3.66	26450	0.607201	7227
3.67	26511	0.608615	7230
3.68	26635	0.611446	7238
3.70	26820	0.615692	7249
3.72	27005	0.619939	7259
3.74	27190	0.624185	7270
3.76	27374	0.628432	7280
3.78	27559	0.632678	7291
3.80	27744	0.636924	7301
3.82	27929	0.641171	7311
3.83	28053	0.644002	7318
3.84	28114	0.645416	7321
3.86	28299	0.649658	7331
3.88	28484	0.653900	7341
3.90	28669	0.658142	7351
3.92	28853	0.662385	7361
3.94	29038	0.666627	7370
3.96	29223	0.670869	7380
3.98	29408	0.675111	7389
4.00	29593	0.679353	7398
4.02	29777	0.683583	7407
4.04	29961	0.687813	7416
4.06	30145	0.692042	7425
4.08	30330	0.696272	7434
4.10	30514	0.700502	7442
4.12	30698	0.704731	7451
4.14	30882	0.708961	7460
4.16	31067	0.713191	7468
4.17	31128	0.714601	7471
4.18	31250	0.717406	7476
4.20	31434	0.721615	7484
4.22	31617	0.725824	7492
4.24	31800	0.730032	7500
4.26	31984	0.734241	7508
4.28	32167	0.738450	7516
4.30	32350	0.742658	7523
4.32	32534	0.746867	7531
4.33	32656	0.749673	7536
4.34	32716	0.751066	7538
4.36	32898	0.755245	7546
4.38	33081	0.759424	7553
4.40	33263	0.763603	7560
4.42	33445	0.767782	7567
4.44	33627	0.771961	7574
4.46	33809	0.776140	7580
4.48	33991	0.780319	7587
4.50	34173	0.784499	7594
4.52	34353	0.788639	7600
4.54	34533	0.792780	7606
4.56	34714	0.796921	7613
4.58	34894	0.801062	7619
4.60	35075	0.805202	7625
4.62	35255	0.809343	7631
4.64	35435	0.813484	7637
4.66	35616	0.817625	7643

Stage Storage HMP-1 CMP (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
4.67	35676	0.819005	7645
4.68	35795	0.821734	7648
4.70	35973	0.825827	7654
4.72	36151	0.829921	7659
4.74	36330	0.834014	7664
4.76	36508	0.838107	7670
4.78	36686	0.842201	7675
4.80	36865	0.846294	7680
4.82	37043	0.850388	7685
4.83	37162	0.853116	7689
4.84	37220	0.854462	7690
4.86	37396	0.858499	7695
4.88	37572	0.862535	7699
4.90	37748	0.866572	7704
4.92	37924	0.870609	7708
4.94	38100	0.874646	7712
4.96	38275	0.878682	7717
4.98	38451	0.882719	7721
5.00	38627	0.886756	7725
5.02	38800	0.890726	7729
5.04	38973	0.894696	7733
5.06	39146	0.898667	7736
5.08	39319	0.902637	7740
5.10	39492	0.906607	7743
5.12	39665	0.910578	7747
5.14	39838	0.914548	7751
5.16	40011	0.918518	7754
5.17	40068	0.919842	7755
5.18	40181	0.922437	7757
5.20	40351	0.926331	7760
5.22	40521	0.930225	7763
5.24	40690	0.934118	7765
5.26	40860	0.938012	7768
5.28	41029	0.941906	7771
5.30	41199	0.945799	7773
5.32	41369	0.949693	7776
5.33	41482	0.952289	7778
5.34	41537	0.953558	7778
5.36	41703	0.957364	7780
5.38	41869	0.961170	7782
5.40	42034	0.964976	7784
5.42	42200	0.968782	7786
5.44	42366	0.972588	7788
5.46	42532	0.976395	7790
5.48	42698	0.980201	7792
5.50	42863	0.984007	7793
5.52	43025	0.987714	7794
5.54	43186	0.991421	7795
5.56	43348	0.995128	7796
5.58	43509	0.998835	7797
5.60	43671	1.002542	7798
5.62	43832	1.006249	7799
5.64	43994	1.009956	7800
5.66	44155	1.013663	7801
5.67	44209	1.014899	7802
5.68	44313	1.017296	7802
5.70	44470	1.020891	7802
5.72	44627	1.024486	7802
5.74	44783	1.028082	7802
5.76	44940	1.031677	7802
5.78	45096	1.035272	7802
5.80	45253	1.038868	7802
5.82	45410	1.042463	7802

Stage Storage HMP-1 CMP (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
5.83	45514	1.044860	7802
5.84	45564	1.046016	7802
5.86	45716	1.049486	7801
5.88	45867	1.052956	7800
5.90	46018	1.056426	7800
5.92	46169	1.059895	7799
5.94	46320	1.063365	7798
5.96	46471	1.066835	7797
5.98	46622	1.070304	7796
6.00	46774	1.073774	7796
6.02	46916	1.077038	7793
6.04	47058	1.080301	7791
6.06	47200	1.083565	7789
6.08	47342	1.086828	7787
6.10	47484	1.090092	7784
6.12	47627	1.093355	7782
6.14	47769	1.096619	7780
6.16	47911	1.099882	7778
6.17	47982	1.101514	7777
6.18	48054	1.103165	7776
6.20	48198	1.106468	7774
6.22	48342	1.109770	7772
6.24	48485	1.113073	7770
6.26	48629	1.116375	7768
6.28	48773	1.119678	7766
6.30	48917	1.122980	7765
6.32	49061	1.126282	7763
6.33	49133	1.127934	7762
6.34	49197	1.129400	7760
6.36	49324	1.132333	7755
6.38	49452	1.135266	7751
6.40	49580	1.138199	7747
6.42	49708	1.141132	7743
6.44	49835	1.144065	7738
6.46	49963	1.146998	7734
6.48	50091	1.149931	7730
6.50	50219	1.152864	7726
6.52	50338	1.155598	7721
6.54	50457	1.158332	7715
6.56	50576	1.161066	7710
6.58	50695	1.163800	7704
6.60	50814	1.166534	7699
6.62	50933	1.169268	7694
6.64	51052	1.172002	7689
6.66	51171	1.174736	7683
6.67	51231	1.176103	7681
6.68	51289	1.177434	7678
6.70	51405	1.180096	7672
6.72	51521	1.182758	7667
6.74	51637	1.185420	7661
6.76	51753	1.188082	7656
6.78	51869	1.190744	7650
6.80	51985	1.193406	7645
6.82	52101	1.196068	7639
6.83	52159	1.197400	7637
6.84	52207	1.198519	7633
6.86	52305	1.200757	7625
6.88	52402	1.202995	7617
6.90	52500	1.205234	7609
6.92	52597	1.207472	7601
6.94	52695	1.209711	7593
6.96	52792	1.211949	7585
6.98	52890	1.214187	7577

Stage Storage HMP-1 CMP (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
7.00	52988	1.216426	7570
7.02	53071	1.218342	7560
7.04	53154	1.220258	7550
7.06	53238	1.222174	7541
7.08	53321	1.224090	7531
7.10	53405	1.226006	7522
7.12	53488	1.227922	7512
7.14	53572	1.229838	7503
7.16	53655	1.231754	7494
7.17	53697	1.232712	7489
7.18	53732	1.233510	7484
7.20	53801	1.235105	7472
7.22	53871	1.236701	7461
7.24	53940	1.238296	7450
7.26	54010	1.239892	7439
7.28	54079	1.241487	7428
7.30	54149	1.243083	7418
7.32	54218	1.244678	7407
7.33	54253	1.245476	7401
7.34	54271	1.245896	7394
7.36	54308	1.246736	7379
7.38	54344	1.247576	7364
7.40	54381	1.248416	7349
7.42	54418	1.249256	7334
7.44	54454	1.250097	7319
7.46	54491	1.250937	7304
7.48	54527	1.251777	7290
7.50	54564	1.252617	7275
7.52	54565	1.253	7256
7.54	54566	1.253	7237
7.56	54567	1.253	7218
7.58	54568	1.253	7199
7.60	54569	1.253	7180
7.62	54570	1.253	7161
7.64	54571	1.253	7143
7.66	54572	1.253	7124
7.67	54572	1.253	7115
7.68	54573	1.253	7106
7.70	54574	1.253	7088
7.72	54575	1.253	7069
7.74	54576	1.253	7051
7.76	54577	1.253	7033
7.78	54578	1.253	7015
7.80	54579	1.253	6997
7.82	54580	1.253	6980
7.83	54581	1.253	6971
7.84	54581	1.253	6962
7.86	54582	1.253	6944
7.88	54583	1.253	6927
7.90	54584	1.253	6909
7.92	54585	1.253	6892
7.94	54586	1.253	6875
7.96	54587	1.253	6858
7.98	54588	1.253	6841
8.00	54589	1.253	6824

HMP-1 (90" CMP Underground Storage)

HMP-1 Total Draw Down (CMP Underground)

Depth	Q_{AVG} (CFS)	V (CF)	DT (HR)	Total T
0.00	0.000	0.0	2.481	43.175
0.24	0.062	549.3	0.297	40.694
0.26	0.066	617.4	0.278	40.397
0.28	0.070	685.5	0.263	40.119
0.30	0.074	753.6	0.250	39.856
0.32	0.078	821.7	0.160	39.606
0.33	0.080	867.1	0.098	39.446
0.34	0.081	895.4	0.286	39.348
0.36	0.084	980.6	0.275	39.062
0.38	0.088	1065.7	0.265	38.787
0.40	0.091	1150.8	0.256	38.522
0.42	0.094	1236.0	0.248	38.266
0.44	0.097	1321.1	0.241	38.017
0.46	0.100	1406.2	0.234	37.776
0.48	0.102	1491.4	0.228	37.542
0.50	0.105	1576.5	0.255	37.314
0.52	0.108	1674.0	0.249	37.059
0.54	0.110	1771.5	0.243	36.810
0.56	0.113	1869.0	0.238	36.567
0.58	0.115	1966.5	0.233	36.329
0.60	0.118	2064.0	0.228	36.097
0.62	0.120	2161.5	0.224	35.868
0.64	0.122	2259.0	0.220	35.645
0.66	0.124	2356.5	0.108	35.425
0.67	0.126	2405.3	0.125	35.316
0.68	0.127	2462.1	0.247	35.191
0.70	0.129	2575.7	0.243	34.944
0.72	0.131	2689.3	0.239	34.701
0.74	0.133	2802.8	0.235	34.462
0.76	0.135	2916.4	0.232	34.227
0.78	0.137	3030.0	0.228	33.995
0.80	0.139	3143.6	0.225	33.767
0.82	0.141	3257.2	0.148	33.542
0.83	0.142	3333.0	0.079	33.394
0.84	0.143	3373.4	0.234	33.315
0.86	0.145	3494.9	0.231	33.081
0.88	0.147	3616.4	0.228	32.850
0.90	0.149	3737.9	0.225	32.621
0.92	0.151	3859.3	0.223	32.396
0.94	0.153	3980.8	0.220	32.174
0.96	0.154	4102.3	0.217	31.954
0.98	0.156	4223.8	0.215	31.736
1.00	0.158	4345.2	0.228	31.522
1.02	0.160	4475.6	0.225	31.294
1.04	0.161	4605.9	0.223	31.068
1.06	0.163	4736.2	0.221	30.845
1.08	0.165	4866.5	0.218	30.624
1.10	0.167	4996.8	0.216	30.406
1.12	0.168	5127.1	0.214	30.190
1.14	0.170	5257.4	0.212	29.975

HMP-1 Total Draw Down (CMP Undergroun

1.16	0.171	5387.8	0.070	29.763
1.17	0.172	5431.2	0.148	29.693
1.18	0.173	5523.3	0.221	29.545
1.20	0.175	5661.4	0.219	29.324
1.22	0.176	5799.5	0.217	29.106
1.24	0.178	5937.6	0.215	28.889
1.26	0.179	6075.7	0.213	28.674
1.28	0.181	6213.8	0.211	28.461
1.30	0.182	6351.9	0.209	28.250
1.32	0.184	6490.0	0.139	28.041
1.33	0.185	6582.0	0.072	27.902
1.34	0.186	6630.4	0.216	27.830
1.36	0.187	6775.4	0.215	27.614
1.38	0.188	6920.4	0.213	27.399
1.40	0.190	7065.4	0.211	27.186
1.42	0.191	7210.4	0.210	26.975
1.44	0.193	7355.4	0.208	26.765
1.46	0.194	7500.4	0.207	26.557
1.48	0.196	7645.4	0.205	26.351
1.50	0.197	7790.4	0.212	26.146
1.52	0.199	7941.5	0.211	25.933
1.54	0.200	8092.7	0.209	25.723
1.56	0.201	8243.8	0.208	25.513
1.58	0.203	8394.9	0.206	25.306
1.60	0.204	8546.1	0.205	25.099
1.62	0.205	8697.2	0.204	24.894
1.64	0.207	8848.4	0.202	24.691
1.66	0.208	8999.5	0.067	24.488
1.67	0.209	9049.9	0.139	24.421
1.68	0.209	9154.3	0.207	24.282
1.70	0.211	9310.9	0.206	24.075
1.72	0.212	9467.5	0.204	23.870
1.74	0.213	9624.1	0.203	23.665
1.76	0.215	9780.8	0.202	23.462
1.78	0.216	9937.4	0.201	23.260
1.80	0.217	10094.0	0.200	23.059
1.82	0.219	10250.6	0.132	22.860
1.83	0.219	10355.0	0.068	22.727
1.84	0.220	10408.8	0.203	22.659
1.86	0.221	10570.3	0.202	22.456
1.88	0.222	10731.8	0.201	22.253
1.90	0.224	10893.3	0.200	22.052
1.92	0.225	11054.7	0.199	21.852
1.94	0.226	11216.2	0.198	21.653
1.96	0.227	11377.7	0.197	21.455
1.98	0.229	11539.2	0.196	21.259
2.00	0.230	11700.6	0.200	21.063
2.02	0.231	11866.4	0.199	20.863
2.04	0.232	12032.2	0.198	20.664
2.06	0.233	12198.0	0.197	20.466
2.08	0.235	12363.8	0.196	20.269
2.10	0.236	12529.6	0.195	20.073
2.12	0.237	12695.4	0.194	19.879
2.14	0.238	12861.2	0.193	19.685
2.16	0.239	13027.0	0.064	19.492
2.17	0.240	13082.3	0.131	19.428
2.18	0.240	13195.4	0.195	19.297
2.20	0.242	13365.0	0.195	19.101
2.22	0.243	13534.6	0.194	18.907
2.24	0.244	13704.2	0.193	18.713
2.26	0.245	13873.8	0.192	18.520
2.28	0.246	14043.4	0.191	18.328
2.30	0.247	14213.0	0.190	18.138
2.32	0.248	14382.6	0.126	17.947

#REF!

HMP-1 Total Draw Down (CMP Undergroun

2.33	0.249	14495.7	0.064	17.821		
2.34	0.250	14553.3	0.192	17.757		
2.36	0.251	14726.3	0.191	17.565		
2.38	0.252	14899.2	0.190	17.374		
2.40	0.253	15072.2	0.190	17.183		
2.42	0.254	15245.1	0.189	16.994		
2.44	0.255	15418.1	0.188	16.805		
2.46	0.256	15591.0	0.187	16.617		
2.48	0.257	15764.0	0.186	16.430		
2.50	0.258	15936.9	0.189	16.243		
2.52	0.259	16112.7	0.188	16.055		
2.54	0.260	16288.6	0.187	15.867		
2.56	0.262	16464.4	0.186	15.679		
2.58	0.263	16640.3	0.186	15.493		
2.60	0.264	16816.1	0.185	15.307		
2.62	0.265	16991.9	0.184	15.123		
2.64	0.266	17167.8	0.183	14.938		
2.66	0.267	17343.6	0.061	14.755		
2.67	0.267	17402.2	0.123	14.694		
2.68	0.268	17521.1	0.185	14.570		
2.70	0.269	17699.4	0.184	14.386		
2.72	0.270	17877.7	0.183	14.202		
2.74	0.271	18056.0	0.182	14.019		
2.76	0.272	18234.3	0.182	13.836		
2.78	0.273	18412.6	0.181	13.655		
2.80	0.274	18591.0	0.180	13.473		
2.82	0.275	18769.3	0.120	13.293		
2.83	0.276	18888.1	0.061	13.173		
2.84	0.276	18948.3	0.181	13.113		
2.86	0.277	19128.6	0.181	12.931		
2.88	0.278	19309.0	0.180	12.751		
2.90	0.279	19489.4	0.179	12.571		
2.92	0.280	19669.7	0.179	12.392		
2.94	0.281	19850.1	0.178	12.213		
2.96	0.282	20030.5	0.177	12.035		
2.98	0.283	20210.9	0.177	11.858		
3.00	0.284	20391.2	0.178	11.681		
3.02	0.285	20573.3	0.177	11.503		
3.04	0.286	20755.3	0.177	11.326		
3.06	0.287	20937.4	0.176	11.149		
3.08	0.288	21119.4	0.175	10.973		
3.10	0.289	21301.4	0.175	10.798		
3.12	0.290	21483.5	0.174	10.623		
3.14	0.291	21665.5	0.174	10.449		
3.16	0.292	21847.6	0.058	10.275		
3.17	0.292	21908.2	0.116	10.218		
3.18	0.293	22030.5	0.174	10.102		
3.20	0.294	22213.8	0.173	9.928		
3.22	0.295	22397.1	0.173	9.755		
3.24	0.295	22580.4	0.172	9.582		
3.26	0.296	22763.8	0.172	9.410		
3.28	0.297	22947.1	0.171	9.239		
3.30	0.298	23130.4	0.170	9.068		
3.32	0.299	23313.8	0.113	8.897		
3.33	0.300	23436.0	0.057	8.784		
3.34	0.300	23497.4	0.170	8.727		
3.36	0.301	23681.6	0.170	8.557		
3.38	0.302	23865.9	0.169	8.387		
3.40	0.303	24050.1	0.169	8.218		
3.42	0.304	24234.4	0.168	8.049	WQ Draw Down =	35.2945 hr
3.44	0.305	24418.6	0.168	7.881		
3.46	0.306	24602.9	0.167	7.713		
3.48	0.307	24787.1	0.167	7.546		
3.50	0.308	24971.4	0.167	7.379		

HMP-1 Total Draw Down (CMP Undergroun

3.52	0.308	25156.1	0.166	7.213
3.54	0.309	25340.9	0.166	7.047
3.56	0.310	25525.7	0.165	6.881
3.58	0.311	25710.5	0.165	6.716
3.60	0.312	25895.3	0.164	6.551
3.62	0.313	26080.1	0.164	6.387
3.64	0.314	26264.9	0.163	6.223
3.66	0.315	26449.7	0.054	6.059
3.67	0.315	26511.3	0.109	6.005
3.68	0.316	26634.6	0.163	5.896
3.70	0.316	26819.6	0.162	5.734
3.72	0.317	27004.5	0.162	5.572
3.74	0.318	27189.5	0.161	5.410
3.76	0.319	27374.5	0.161	5.249
3.78	0.320	27559.5	0.160	5.088
3.80	0.321	27744.4	0.160	4.927
3.82	0.322	27929.4	0.106	4.767
3.83	0.322	28052.7	0.053	4.661
3.84	0.323	28114.3	0.159	4.608
3.86	0.323	28299.1	0.159	4.449
3.88	0.324	28483.9	0.158	4.291
3.90	0.325	28668.7	0.157	4.132
3.92	0.330	28853.5	0.152	3.976
3.94	0.344	29038.3	0.145	3.824
3.96	0.365	29223.1	0.135	3.679
3.98	0.393	29407.8	0.125	3.543
4.00	0.428	29592.6	0.114	3.418
4.02	0.468	29776.9	0.104	3.304
4.04	0.513	29961.1	0.095	3.200
4.06	0.563	30145.4	0.087	3.105
4.08	0.616	30329.6	0.080	3.018
4.10	0.671	30513.9	0.073	2.938
4.12	0.727	30698.1	0.069	2.865
4.14	0.766	30882.3	0.065	2.796
4.16	0.797	31066.6	0.021	2.731
4.17	0.807	31128.0	0.042	2.710
4.18	0.827	31250.2	0.061	2.668
4.20	0.855	31433.6	0.059	2.608
4.22	0.884	31616.9	0.056	2.549
4.24	0.919	31800.2	0.054	2.493
4.26	0.958	31983.5	0.052	2.438
4.28	1.001	32166.9	0.050	2.386
4.30	1.048	32350.2	0.047	2.337
4.32	1.098	32533.5	0.030	2.289
4.33	1.133	32655.7	0.015	2.259
4.34	1.151	32716.4	0.043	2.244
4.36	1.206	32898.5	0.041	2.201
4.38	1.263	33080.5	0.039	2.160
4.40	1.322	33262.6	0.037	2.121
4.42	1.381	33444.6	0.036	2.083
4.44	1.426	33626.6	0.035	2.047
4.46	1.466	33808.7	0.034	2.012
4.48	1.505	33990.7	0.033	1.978
4.50	1.542	34172.8	0.032	1.945
4.52	1.577	34353.1	0.031	1.913
4.54	1.612	34533.5	0.031	1.882
4.56	1.645	34713.9	0.030	1.851
4.58	1.678	34894.2	0.030	1.821
4.60	1.709	35074.6	0.029	1.791
4.62	1.740	35255.0	0.029	1.762
4.64	1.770	35435.4	0.028	1.734
4.66	1.800	35615.7	0.009	1.705
4.67	1.810	35675.8	0.018	1.696
4.68	1.829	35794.7	0.027	1.678

HMP-1 Total Draw Down (CMP Undergroun

4.70	1.857	35973.0	0.026	1.651
4.72	1.885	36151.3	0.026	1.625
4.74	1.912	36329.6	0.026	1.599
4.76	1.939	36508.0	0.025	1.573
4.78	1.965	36686.3	0.025	1.548
4.80	1.991	36864.6	0.025	1.522
4.82	2.017	37042.9	0.016	1.498
4.83	2.033	37161.8	0.008	1.481
4.84	2.042	37220.4	0.024	1.473
4.86	2.067	37396.2	0.023	1.450
4.88	2.091	37572.0	0.023	1.426
4.90	2.115	37747.9	0.023	1.403
4.92	2.139	37923.7	0.023	1.380
4.94	2.162	38099.6	0.022	1.357
4.96	2.185	38275.4	0.022	1.335
4.98	2.208	38451.2	0.022	1.313
5.00	2.231	38627.1	0.021	1.291
5.02	2.253	38800.0	0.021	1.269
5.04	2.275	38973.0	0.021	1.248
5.06	2.297	39145.9	0.021	1.227
5.08	2.319	39318.9	0.021	1.206
5.10	2.340	39491.8	0.020	1.185
5.12	2.361	39664.8	0.020	1.165
5.14	2.382	39837.7	0.020	1.145
5.16	2.403	40010.7	0.007	1.125
5.17	2.410	40068.3	0.013	1.118
5.18	2.423	40181.4	0.019	1.105
5.20	2.444	40351.0	0.019	1.086
5.22	2.464	40520.6	0.019	1.067
5.24	2.484	40690.2	0.019	1.047
5.26	2.504	40859.8	0.019	1.029
5.28	2.523	41029.4	0.019	1.010
5.30	2.543	41199.0	0.018	0.991
5.32	2.562	41368.6	0.012	0.973
5.33	2.575	41481.7	0.006	0.961
5.34	2.581	41537.0	0.018	0.955
5.36	2.600	41702.8	0.018	0.937
5.38	2.619	41868.6	0.018	0.919
5.40	2.637	42034.4	0.017	0.902
5.42	2.656	42200.2	0.017	0.884
5.44	2.674	42366.0	0.017	0.867
5.46	2.693	42531.7	0.017	0.850
5.48	2.711	42697.5	0.017	0.833
5.50	2.729	42863.3	0.016	0.816
5.52	2.746	43024.8	0.016	0.799
5.54	2.764	43186.3	0.016	0.783
5.56	2.782	43347.8	0.016	0.767
5.58	2.799	43509.3	0.016	0.751
5.60	2.817	43670.7	0.016	0.735
5.62	2.834	43832.2	0.016	0.719
5.64	2.851	43993.7	0.016	0.703
5.66	2.868	44155.2	0.005	0.688
5.67	2.874	44209.0	0.010	0.682
5.68	2.885	44313.4	0.015	0.672
5.70	2.902	44470.0	0.015	0.657
5.72	2.918	44626.6	0.015	0.642
5.74	2.935	44783.2	0.015	0.627
5.76	2.951	44939.8	0.015	0.613
5.78	2.968	45096.5	0.015	0.598
5.80	2.984	45253.1	0.015	0.583
5.82	3.000	45409.7	0.010	0.569
5.83	3.011	45514.1	0.005	0.559
5.84	3.016	45564.5	0.014	0.555
5.86	3.032	45715.6	0.014	0.541

HMP-1 Total Draw Down (CMP Undergroun

5.88	3.048	45866.8	0.014	0.527
5.90	3.064	46017.9	0.014	0.513
5.92	3.080	46169.0	0.014	0.499
5.94	3.095	46320.2	0.014	0.486
5.96	3.111	46471.3	0.013	0.472
5.98	3.127	46622.5	0.013	0.459
6.00	3.142	46773.6	0.013	0.445
6.02	3.171	46915.8	0.012	0.433
6.04	3.211	47057.9	0.012	0.421
6.06	3.259	47200.1	0.012	0.408
6.08	3.313	47342.2	0.012	0.396
6.10	3.372	47484.4	0.012	0.385
6.12	3.435	47626.6	0.011	0.373
6.14	3.503	47768.7	0.011	0.362
6.16	3.574	47910.9	0.005	0.350
6.17	3.611	47982.0	0.006	0.345
6.18	3.649	48053.9	0.011	0.339
6.20	3.727	48197.7	0.011	0.329
6.22	3.809	48341.6	0.010	0.318
6.24	3.893	48485.4	0.010	0.308
6.26	3.981	48629.3	0.010	0.297
6.28	4.071	48773.2	0.010	0.287
6.30	4.164	48917.0	0.009	0.278
6.32	4.260	49060.9	0.005	0.268
6.33	4.308	49132.8	0.004	0.264
6.34	4.358	49196.7	0.008	0.260
6.36	4.458	49324.4	0.008	0.251
6.38	4.561	49452.2	0.008	0.244
6.40	4.667	49579.9	0.008	0.236
6.42	4.774	49707.7	0.007	0.228
6.44	4.884	49835.5	0.007	0.221
6.46	4.996	49963.2	0.007	0.214
6.48	5.109	50091.0	0.007	0.207
6.50	5.225	50218.7	0.006	0.200
6.52	5.282	50337.8	0.006	0.194
6.54	5.330	50456.9	0.006	0.187
6.56	5.376	50576.0	0.006	0.181
6.58	5.422	50695.1	0.006	0.175
6.60	5.467	50814.2	0.006	0.169
6.62	5.512	50933.3	0.006	0.163
6.64	5.556	51052.4	0.006	0.157
6.66	5.600	51171.5	0.003	0.151
6.67	5.622	51231.0	0.003	0.148
6.68	5.643	51289.0	0.006	0.145
6.70	5.686	51405.0	0.006	0.140
6.72	5.728	51520.9	0.006	0.134
6.74	5.770	51636.9	0.006	0.128
6.76	5.811	51752.9	0.006	0.123
6.78	5.852	51868.8	0.005	0.117
6.80	5.892	51984.8	0.005	0.112
6.82	5.932	52100.7	0.003	0.106
6.83	5.952	52158.7	0.002	0.104
6.84	5.972	52207.5	0.005	0.101
6.86	6.011	52305.0	0.004	0.097
6.88	6.050	52402.5	0.004	0.092
6.90	6.089	52500.0	0.004	0.088
6.92	6.127	52597.5	0.004	0.083
6.94	6.165	52695.0	0.004	0.079
6.96	6.203	52792.5	0.004	0.075
6.98	6.240	52890.0	0.004	0.070
7.00	6.278	52987.5	0.004	0.066
7.02	6.314	53071.0	0.004	0.062
7.04	6.351	53154.4	0.004	0.059
7.06	6.387	53237.9	0.004	0.055

HMP-1 Total Draw Down (CMP Undergroun

7.08	6.423	53321.4	0.004	0.051
7.10	6.459	53404.8	0.004	0.048
7.12	6.494	53488.3	0.004	0.044
7.14	6.530	53571.7	0.004	0.041
7.16	6.564	53655.2	0.002	0.037
7.17	6.582	53696.9	0.001	0.035
7.18	6.599	53731.7	0.003	0.034
7.20	6.634	53801.2	0.003	0.031
7.22	6.668	53870.7	0.003	0.028
7.24	6.702	53940.2	0.003	0.025
7.26	6.736	54009.7	0.003	0.022
7.28	6.770	54079.2	0.003	0.019
7.30	6.803	54148.7	0.003	0.017
7.32	6.836	54218.2	0.001	0.014
7.33	6.853	54252.9	0.001	0.012
7.34	6.869	54271.2	0.001	0.012
7.36	6.902	54307.8	0.001	0.010
7.38	6.935	54344.4	0.001	0.009
7.40	6.967	54381.0	0.001	0.007
7.42	7.000	54417.6	0.001	0.006
7.44	7.032	54454.2	0.001	0.004
7.46	7.064	54490.8	0.001	0.003
7.48	7.095	54527.4	0.001	0.001
7.50	7.127	54564.0		

DMA-2

DMA 2: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.50	inches
2	Area tributary to BMP (s)	A=	0.63	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.65	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	744	cubic-feet

The City of SAN DIEGO	Project Name	BDM Mixed Use	
	BMP ID	BF-1-2	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	27282.00	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.65	
3	85th percentile 24-hour rainfall depth	0.5	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	744	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	6	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	0.086	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	0.516	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	16.8	inches
15	Total Depth Treated [Line 13 + Line 14]	17.316	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	1116	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	774	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	558	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	399	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	536	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	536	sq. ft.
23	Provided BMP Footprint	750	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	BDM MIXED USE	
	BMP ID	BF1-2	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	
1	Area draining to the BMP	27282.00	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.65	
3	85th percentile 24-hour rainfall depth	0.51	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	759	cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05	0	in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5 / Line 6]	0	in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%	3.5	%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = 0.0000013 x Line 8^3 - 0.000057 x Line 8^2 + 0.0086 x Line 8 - 0.014 When Line 8 ≤ 8% = 0.023	0.023	
10	Target volume retention [Line 9 x Line 4]	17	cu. ft.

The City of SAN DIEGO	Project Name	BDM MIXED USE	
	BMP ID	BF-1-2	

Volume Retention for No Infiltration Condition			Worksheet B.5-6	
1	Area draining to the biofiltration BMP		27282.00	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)		0.65	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]		17863	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]		536	sq. ft.
5	Biofiltration BMP Footprint		750	sq. ft.

Landscape Area (must be identified on DS-3247)

		Identification	1	2	3	4	5
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)						
7	Impervious area draining to the landscape area (sq. ft.)						
8	Impervious to Pervious Area ratio [Line 7/Line 6]		0.00	0.00	0.00	0.00	0.00
9	Effective Credit Area If (Line 8 >1.5, Line 6, Line 7/1.5]		0	0	0	0	0
10	Sum of Landscape area [sum of Line 9 Id's 1 to 5]					0	sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]					750	sq. ft.

Volume Retention Performance Standard

12	Is Line 11 ≥ Line 4?	Volume Retention Performance Standard is Met	
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]	1.4	
14	Target Volume Retention [Line 10 from Worksheet B.5.2]	17	cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]	-6.984459588	cu. ft.

Site Design BMP

	Identification	Site Design Type	Credit	
16	1			cu. ft.
	2			cu. ft.
	3			cu. ft.
	4			cu. ft.
	5			cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Line 16 Credits for Id's 1 to 5] Provide documentation of how the site design credit is calculated in the PDP SWQMP.		0	cu. ft.
17	Is Line 16 ≥ Line 15?	Volume Retention Performance Standard is Met		

DCV CALCULATION

DMA 4: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.50	inches
2	Area tributary to BMP (s)	A=	0.83	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.69	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	1,033	cubic-feet

DMA 4: Compact Biofiltration Design Flows		Worksheet B.6-1		
1	DCV	DCV	1,033	cubic-feet
2	DCV Retained	DCV Retained	0.00	cubic-feet
3	DCV Biofiltered	DCV Biofiltered	0.00	cubic-feet
4	DCV requiring flow-thru (Line 1 - Line 2 - 0.67*Line 3)	DCV flow-thru	1,033	cubic-feet
5	Adjustment Factor (Line 4 / Line1)	AF=	1.00	unitless
6	Design rainfall intensity	i=	0.2	in/hr
7	Area tributary to BMP(s)	A=	0.83	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.69	unitless
9	Calculate Flow Rate = AF x (C x i x A) x1.5	Q=	0.171	cfs

1) Adjustment factor shall be estimated considering only retention and biofiltration BMPs located upstream
2) Volume based (e.g., dry extended detention basin) Compact Biofiltration treatment control BMPs shall be
3) Propietary BMPs, if used, shall provide certified treatment capacity equal to or greater than the calculated
4) Compact Biofiltration treatment control BMPs shall be sized to filter or treat the maximum flow rate of

MWS Linear | *Sizing Options*

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

Model #	Dimensions	WetlandMEDIA Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4′ x 4′	23 sq. ft.	0.052
MWS-L-4-6	4′ x 6′	32 sq. ft.	0.073
MWS-L-4-8	4′ x 8′	50 sq. ft.	0.115
MWS-L-4-13	4′ x 13′	63 sq. ft.	0.144
MWS-L-4-15	4′ x 15′	76 sq. ft.	0.175
MWS-L-4-17	4′ x 17′	90 sq. ft.	0.206
MWS-L-4-19	4′ x 19′	103 sq. ft.	0.237
MWS-L-4-21	4′ x 21′	117 sq. ft.	0.268
MWS-L-6-8	7′ x 9′	64 sq. ft.	0.147
MWS-L-8-8	8′ x 8′	100 sq. ft.	0.230
MWS-L-8-12	8′ x 12′	151 sq. ft.	0.346
MWS-L-8-16	8′ x 16′	201 sq. ft.	0.462
MWS-L-8-20	9′ x 21′	252 sq. ft.	0.577
MWS-L-8-24	9′ x 25′	302 sq. ft.	0.693

BF-3-1, BF-3-4

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Compact (high rate) biofiltration BMPs have a media filtration rate greater than 5 in/hr. and a media surface area smaller than 3% of contributing area times adjusted runoff factor. Compact biofiltration BMPs are typically proprietary BMPs that may qualify as biofiltration.

A compact biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA **and** the performance certification/data of the BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite storm water alternative compliance program to meet its pollutant control obligations.

An applicant using a compact biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.

Section 1: Biofiltration Criteria Checklist (Appendix F)

Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.

Criteria	Answer	Progression
Criteria 1 and 3: What is the infiltration condition of the DMA? Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. Applicant must complete and include the following in the PDP SWQMP submittal to support the feasibility determination: • Infiltration Feasibility Condition Letter; or • Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B. Applicant must complete and include all applicable sizing worksheets in the SWQMP submittal	○ Full Infiltration Condition	**Stop**. Compact biofiltration BMP is not allowed.
	○ Partial Infiltration Condition	Compact biofiltration BMP is only allowed, if the target volume retention is met onsite (Refer to Table B.5-1 in Appendix B.5). Use Worksheet B.5-2 in Appendix B.5 to estimate the target volume retention (Note: retention in this context means reduction). If the required volume reduction is achieved **proceed to Criteria 2**. If the required volume reduction is not achieved, compact biofiltration BMP is not allowed. **Stop**.
	◉ No Infiltration Condition	Compact biofiltration BMP is allowed if volume retention criteria in Table B.5-1 in Appendix B.5 for the no infiltration condition is met. Compliance with this criterion must be documented in the PDP SWQMP. If the criteria in Table B.5-1 is met **proceed to Criteria 2**. If the criteria in Table B.5-1 is not met, compact biofiltration BMP is not allowed. **Stop**.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:

Summarize findings and include either infiltration feasibility condition letter or Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B in the PDP SWQMP submittal.

If Partial Infiltration Condition:

Provide documentation that target volume retention is met (include Worksheet B.5-2 in the PDP SWQMP submittal). Worksheet B.5-7 in Appendix B.5 can be used to estimate volume retention benefits from landscape areas.

If No Infiltration Condition:

Provide documentation that the volume retention performance standard is met (include Worksheet B.5-2 in the PDP SWQMP submittal) in the PDP SWQMP submittal. Worksheet B.5-6 in Appendix B.5 can be used to document that the performance standard is met.

Criteria	Answer	Progression
Criteria 2: Is the compact biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Meets Flow based Criteria	Use guidance from **Appendix F.2.2** to size the compact biofiltration BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft. cannot be designed using a loading rate of 1.5 gpm/sq. ft.) **Proceed to Criteria 4.**
	○ Meets Volume based Criteria	Provide documentation that the compact biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	○ Does not Meet either criteria	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

Refer to attached Calculations in Worksheet B.6-1

Criteria	Answer	Progression
Criteria 4: Does the compact biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes, meets the TAPE certification.	Provide documentation that the compact BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	○ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a compact biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the compact biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

Refer to attached TAPE Certification.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
<u>Criteria 5</u>: Is the compact biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes	Provide documentation that the compact biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 5:

Provide documentation that appropriate biological activity is supported by the compact biofiltration BMP to maintain treatment process.

Refer to Manufacturer Specifications.

Criteria	Answer	Progression
<u>Criteria 6</u>: Is the compact biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	◉ Yes	Provide documentation that the compact biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 6:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).

Refer to Manufacturer Specifications.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the compact biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	○ Yes, and the compact BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop**. The compact biofiltration BMP meets the required criteria.
	◉ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop**. Consult the City Engineer for a determination.
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. PDP SWQMP must include a statement that the compact BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

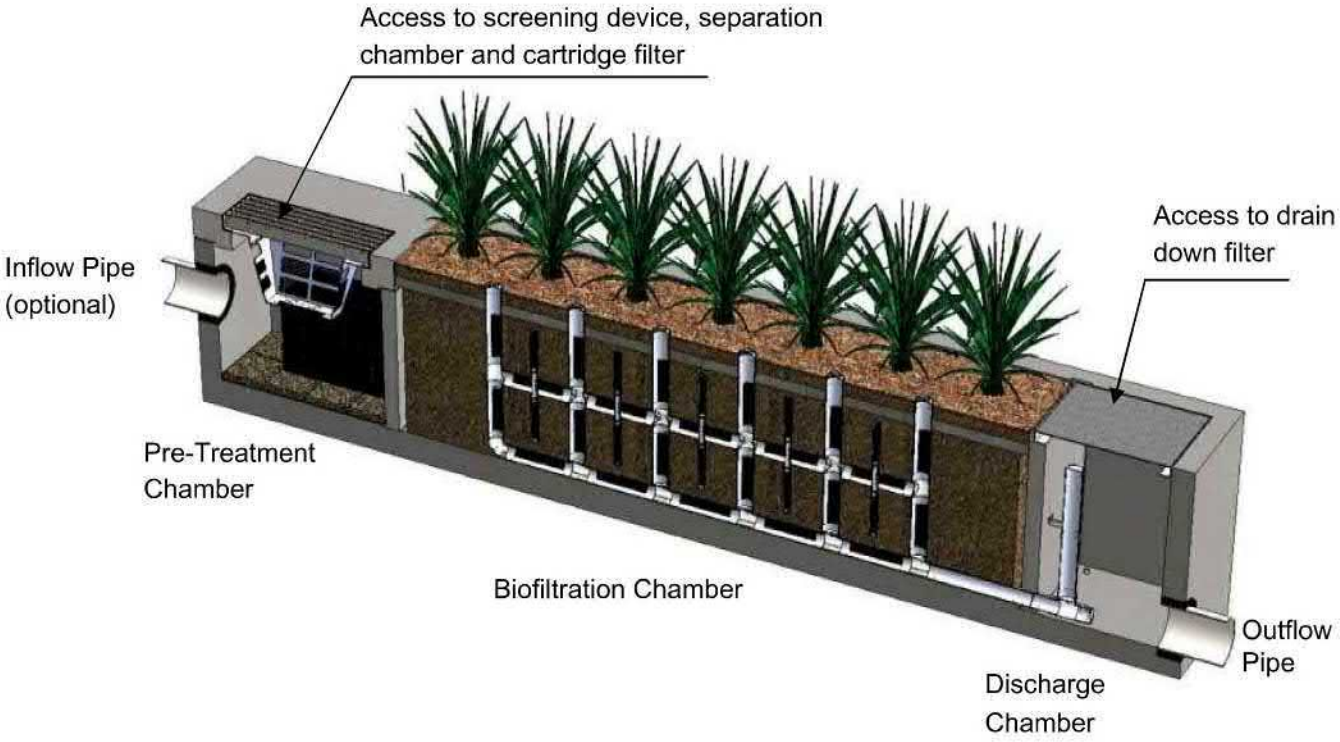
Compact (high rate) Biofiltration BMP Checklist	Form I-10
Section 2: Verification (For City Use Only)	
Is the proposed compact BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	◉ Yes ○ No, See explanation below
Explanation/reason if the compact BMP is not accepted by the City for onsite pollutant control compliance:	

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes:

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

WASHINGTON STATE DEPARTMENT OF ECOLOGY

July 2017

GENERAL USE LEVEL DESIGNATION FOR BASIC, ENHANCED, AND PHOSPHORUS TREATMENT

For the

MWS-Linear Modular Wetland

Ecology's Decision:

Based on Modular Wetland Systems, Inc. application submissions, including the Technical Evaluation Report, dated April 1, 2014, Ecology hereby issues the following use level designation:

1. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Basic treatment

   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

2. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Phosphorus treatment

   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

3. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Enhanced treatment

   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

4. Ecology approves the MWS - Linear Modular Wetland Stormwater Treatment System units for Basic, Phosphorus, and Enhanced treatment at the hydraulic loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:

   - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
   - Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
   - Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

5. These use level designations have no expiration date but may be revoked or amended by Ecology, and are subject to the conditions specified below.

Ecology's Conditions of Use:

Applicants shall comply with the following conditions:

1. Design, assemble, install, operate, and maintain the MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Modular Wetland Systems, Inc. applicable manuals and documents and the Ecology Decision.
2. Each site plan must undergo Modular Wetland Systems, Inc. review and approval before site installation. This ensures that site grading and slope are appropriate for use of a MWS – Linear Modular Wetland Stormwater Treatment System unit.
3. MWS – Linear Modular Wetland Stormwater Treatment System media shall conform to the specifications submitted to, and approved by, Ecology.
4. The applicant tested the MWS – Linear Modular Wetland Stormwater Treatment System with an external bypass weir. This weir limited the depth of water flowing through the media, and therefore the active treatment area, to below the root zone of the plants. This GULD applies to MWS – Linear Modular Wetland Stormwater Treatment Systems whether plants are included in the final product or not.
5. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.

   - Typically, Modular Wetland Systems, Inc. designs MWS - Linear Modular Wetland systems for a target prefilter media life of 6 to 12 months.
   - Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
   - Owners/operators must inspect MWS - Linear Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific

maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
- When inspections are performed, the following findings typically serve as maintenance triggers:
    - Standing water remains in the vault between rain events, or
    - Bypass occurs during storms smaller than the design storm.
    - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
    - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)

6. Discharges from the MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant:	Modular Wetland Systems, Inc.
Applicant's Address:	*PO. Box 869* *Oceanside, CA 92054*

Application Documents:

- *Original Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011
- *Quality Assurance Project Plan*: Modular Wetland system – Linear Treatment System performance Monitoring Project, draft, January 2011.
- *Revised Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011
- *Memorandum: Modular Wetland System-Linear GULD Application Supplementary Data, April 2014*
- *Technical Evaluation Report: Modular Wetland System Stormwater Treatment System Performance Monitoring, April 2014.*

Applicant's Use Level Request:

General use level designation as a Basic, Enhanced, and Phosphorus treatment device in accordance with Ecology's Guidance for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) January 2011 Revision.

Applicant's Performance Claims:

- The MWS – Linear Modular wetland is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 50-percent of Total Phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 30-percent of dissolved Copper from stormwater with influent concentrations between 0.005 and 0.020 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 60-percent of dissolved Zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/l.

Ecology Recommendations:

- Modular Wetland Systems, Inc. has shown Ecology, through laboratory and field-testing, that the MWS - Linear Modular Wetland Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Total phosphorus, and Enhanced treatment goals.

Findings of Fact:

<u>Laboratory Testing</u>

The MWS-Linear Modular wetland has the:

- Capability to remove 99 percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91 percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93 percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79 percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

Field Testing

- Modular Wetland Systems, Inc. conducted monitoring of an MWS-Linear (Model # MWS-L-4-13) from April 2012 through May 2013, at a transportation maintenance facility in Portland, Oregon. The manufacturer collected flow-weighted composite samples of the system's influent and effluent during 28 separate storm events. The system treated approximately 75 percent of the runoff from 53.5 inches of rainfall during the monitoring period. The applicant sized the system at 1 gpm/sq ft. (wetland media) and 3gpm/sq ft. (prefilter).
- Influent TSS concentrations for qualifying sampled storm events ranged from 20 to 339 mg/L. Average TSS removal for influent concentrations greater than 100 mg/L (n=7) averaged 85 percent. For influent concentrations in the range of 20-100 mg/L (n=18), the upper 95 percent confidence interval about the mean effluent concentration was 12.8 mg/L.
- Total phosphorus removal for 17 events with influent TP concentrations in the range of 0.1 to 0.5 mg/L averaged 65 percent. A bootstrap estimate of the lower 95 percent confidence limit (LCL95) of the mean total phosphorus reduction was 58 percent.
- The lower 95 percent confidence limit of the mean percent removal was 60.5 percent for dissolved zinc for influent concentrations in the range of 0.02 to 0.3 mg/L (n=11). The lower 95 percent confidence limit of the mean percent removal was 32.5 percent for dissolved copper for influent concentrations in the range of 0.005 to 0.02 mg/L (n=14) at flow rates up to 28 gpm (design flow rate 41 gpm). Laboratory test data augmented the data set, showing dissolved copper removal at the design flow rate of 41 gpm (93 percent reduction in influent dissolved copper of 0.757 mg/L).

Issues to be addressed by the Company:

1. Modular Wetland Systems, Inc. should collect maintenance and inspection data for the first year on all installations in the Northwest in order to assess standard maintenance requirements for various land uses in the region. Modular Wetland Systems, Inc. should use these data to establish required maintenance cycles.
2. Modular Wetland Systems, Inc. should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Modular Wetland Systems, Inc. will use these data to create a correlation between sediment depth and pre-filter clogging.

Technology Description:
Download at http://www.modularwetlands.com/

Contact Information:

Applicant: Zach Kent
BioClean A Forterra Company.
398 Vi9a El Centro
Oceanside, CA 92058
zach.kent@forterrabp.com

Applicant website: http://www.modularwetlands.com/

Ecology web link: http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html

Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

Date	**Revision**
June 2011	Original use-level-designation document
September 2012	Revised dates for TER and expiration
January 2013	Modified Design Storm Description, added Revision Table, added maintenance discussion, modified format in accordance with Ecology standard
December 2013	Updated name of Applicant
April 2014	Approved GULD designation for Basic, Phosphorus, and Enhanced treatment
December 2015	Updated GULD to document the acceptance of MWS-Linear Modular Wetland installations with or without the inclusion of plants
July 2017	Revised Manufacturer Contact Information (name, address, and email)

Bio Clean

A Forterra Company

Modular Wetlands® System Linear

A Stormwater Biofiltration Solution

OVERVIEW

The Bio Clean Modular Wetlands® System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint, higher treatment capacity, and a wide range of versatility. While most biofilters use little or no pretreatment, the Modular Wetlands® incorporates an advanced pretreatment chamber that includes separation and pre-filter cartridges. In this chamber, sediment and hydrocarbons are removed from runoff before entering the biofiltration chamber, reducing maintenance costs and improving performance.

Horizontal flow also gives the system the unique ability to adapt to the environment through a variety of configurations, bypass orientations, and diversion applications.

The Urban Impact

For hundreds of years, natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as cities grow and develop, our environment's natural filtration systems are blanketed with impervious roads, rooftops, and parking lots.

Bio Clean understands this loss and has spent years re-establishing nature's presence in urban areas, and rejuvenating waterways with the Modular Wetlands® System Linear.

PERFORMANCE

The Modular Wetlands® continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons, and bacteria. Since 2007 the Modular Wetlands® has been field tested on numerous sites across the country and is proven to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. In fact, the Modular Wetlands® harnesses some of the same biological processes found in natural wetlands in order to collect, transform, and remove even the most harmful pollutants.

66% REMOVAL OF DISSOLVED ZINC	**69%** REMOVAL OF TOTAL ZINC	**38%** REMOVAL OF DISSOLVED COPPER	**64%** REMOVAL OF TOTAL PHOSPHORUS	
45% REMOVAL OF NITROGEN	**50%** REMOVAL OF TOTAL COPPER	**95%** REMOVAL OF MOTOR OIL	**67%** REMOVAL OF ORTHO PHOSPHORUS	**85%** REMOVAL OF TSS

APPROVALS

The Modular Wetlands® System Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation and perhaps the world. Here is a list of some of the most high-profile approvals, certifications, and verifications from around the country.

Washington State Department of Ecology TAPE Approved
The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft² loading rate. The highest performing BMP on the market for all main pollutant categories.

California Water Resources Control Board, Full Capture Certification
The Modular Wetlands® System is the first biofiltration system to receive certification as a full capture trash treatment control device.

Virginia Department of Environmental Quality, Assignment
The Virginia Department of Environmental Quality assigned the MWS Linear the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) regulation technical criteria.

Maryland Department of the Environment, Approved ESD
Granted Environmental Site Design (ESD) status for new construction, redevelopment, and retrofitting when designed in accordance with the design manual.

MASTEP Evaluation
The University of Massachusetts at Amherst – Water Resources Research Center issued a technical evaluation report noting removal rates up to 84% TSS, 70% total phosphorus, 68.5% total zinc, and more.

Rhode Island Department of Environmental Management, Approved BMP
Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% pathogens, 30% total phosphorus, and 30% total nitrogen.

ADVANTAGES

- HORIZONTAL FLOW BIOFILTRATION
- GREATER FILTER SURFACE AREA
- PRETREATMENT CHAMBER
- PATENTED PERIMETER VOID AREA
- FLOW CONTROL
- NO DEPRESSED PLANTER AREA
- AUTO DRAINDOWN MEANS NO MOSQUITO VECTOR

OPERATION

The Modular Wetlands® System Linear is the most efficient and versatile biofiltration system on the market, and it is the only system with horizontal flow which:

- Improves performance
- Reduces footprint
- Minimizes maintenance

Figure 1 & Figure 2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

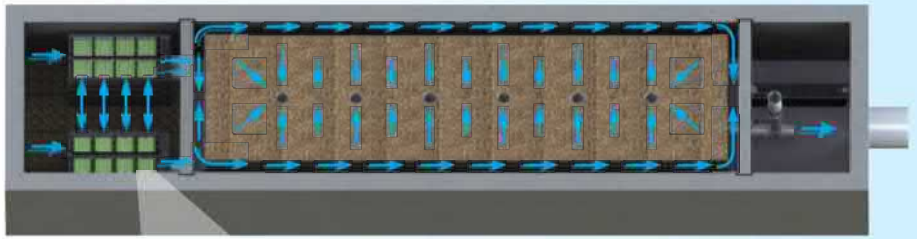


Figure 2,
Top View

2x to 3x more surface area than traditional downward flow bioretention systems.

1 PRETREATMENT

SEPARATION

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

PRE-FILTER CARTRIDGES

- Over 25 sq. ft. of surface area per cartridge
- Utilizes BioMediaGREEN™ filter material
- Removes over 80% of TSS and 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber

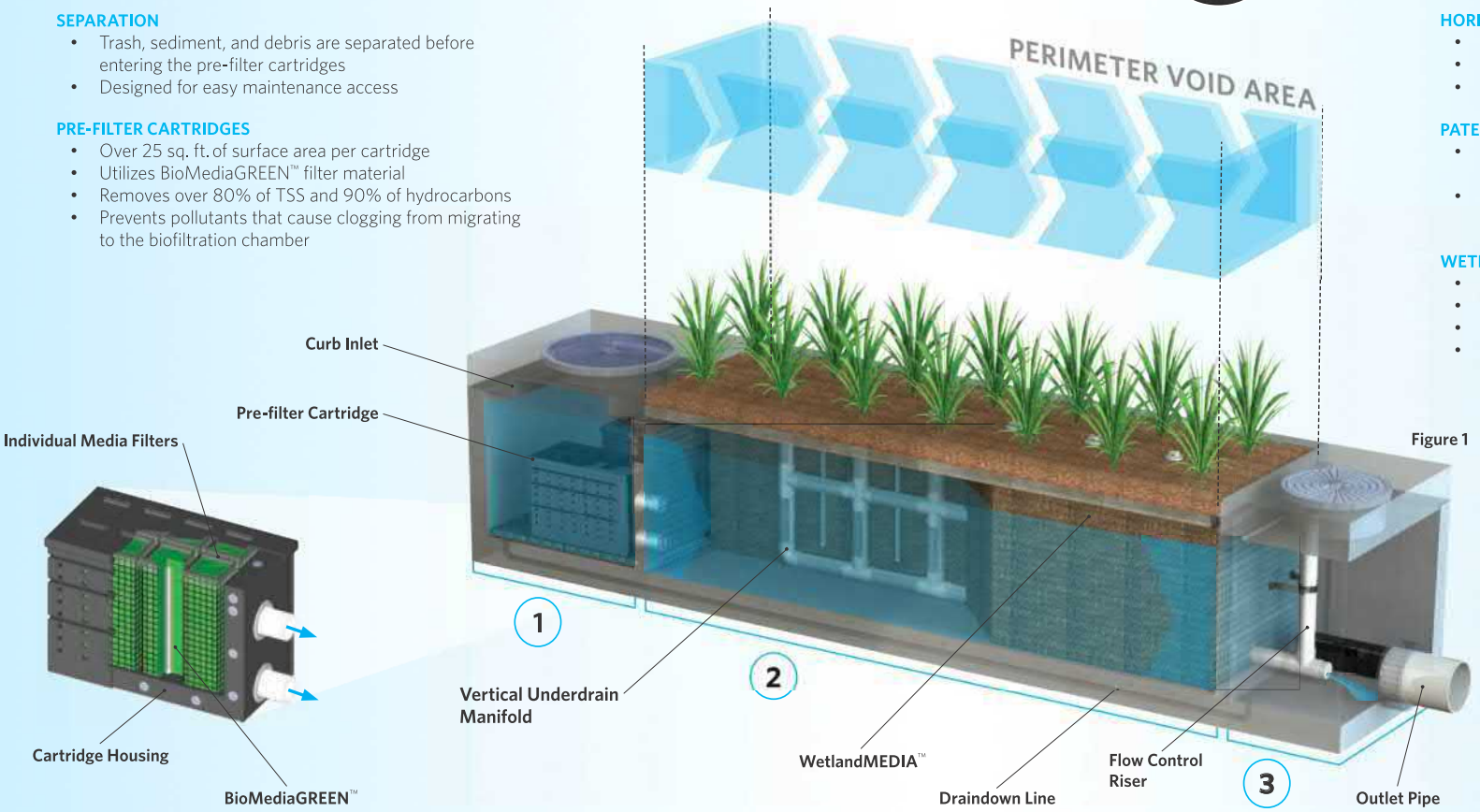


Figure 1

2 BIOFILTRATION

HORIZONTAL FLOW

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

PATENTED PERIMETER VOID AREA

- Vertically extends void area between the walls and the WetlandMEDIA™ on all four sides
- Maximizes surface area of the media for higher treatment capacity

WETLANDMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and lightweight

3 DISCHARGE

FLOW CONTROL

- Orifice plate controls flow of water through WetlandMEDIA™ to a level lower than the media's capacity
- Extends the life of the media and improves performance

DRAINDOWN FILTER

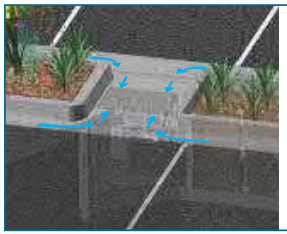
- The draindown is an optional feature that completely drains the pretreatment chamber
- Water that drains from the pretreatment chamber between storm events will be treated

CONFIGURATIONS

The Modular Wetlands® System Linear is the preferred biofiltration system of civil engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your storm drain design.

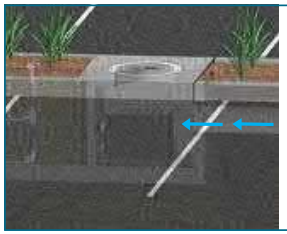
CURB TYPE

The Curb Type configuration accepts sheet flow through a curb opening and is commonly used along roadways and parking lots. It can be used in sump or flow-by conditions. Length of curb opening varies based on model and size.



GRATE TYPE

The Grate Type configuration offers the same features and benefits as the Curb Type but with a grated/drop inlet above the systems pretreatment chamber. It has the added benefit of allowing pedestrian access over the inlet. ADA-compliant grates are available to assure easy and safe access. The Grate Type can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



VAULT TYPE

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pretreatment chamber, meaning the Modular Wetlands® can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/ bioretention systems. Another benefit of the "pipe-in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

DOWNSPOUT TYPE

The Downspout Type is a variation of the Vault Type and is designed to accept a vertical downspout pipe from rooftop and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter, and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

ORIENTATIONS

SIDE-BY-SIDE

The Side-By-Side orientation places the pretreatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.

END-TO-END

The End-To-End orientation places the pretreatment and discharge chambers on opposite ends of the biofiltration chamber, therefore minimizing the width of the system to 5 ft. (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is that bypass must be external.

BYPASS

INTERNAL BYPASS WEIR (SIDE-BY-SIDE ONLY)

The Side-By-Side orientation places the pretreatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pretreatment chamber directly to the discharge chamber.

EXTERNAL DIVERSION WEIR STRUCTURE

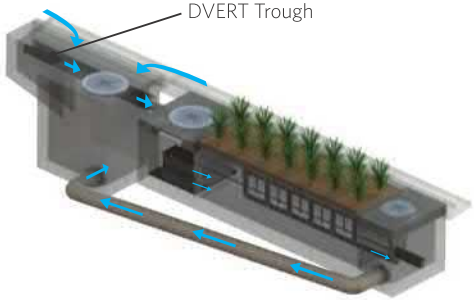
This traditional offline diversion method can be used with the Modular Wetlands® in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the Modular Wetlands® for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

FLOW-BY-DESIGN

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the Modular Wetlands® and into the standard inlet downstream.

DVERT LOW FLOW DIVERSION

This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the Modular Wetlands® via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over



to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allow the Modular Wetlands® to be installed anywhere space is available.

SPECIFICATIONS

FLOW-BASED DESIGNS

The Modular Wetlands® System Linear can be used in stand-alone applications to meet treatment flow requirements. Since the Modular Wetlands® is the only biofiltration system that can accept inflow pipes several feet below the surface, it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

MODEL #	DIMENSIONS	WETLANDMEDIA SURFACE AREA (sq. ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4' x 4'	23	0.052
MWS-L-4-6	4' x 6'	32	0.073
MWS-L-4-8	4' x 8'	50	0.115
MWS-L-4-13	4' x 13'	63	0.144
MWS-L-4-15	4' x 15'	76	0.175
MWS-L-4-17	4' x 17'	90	0.206
MWS-L-4-19	4' x 19'	103	0.237
MWS-L-4-21	4' x 21'	117	0.268
MWS-L-6-8	7' x 9'	64	0.147
MWS-L-8-8	8' x 8'	100	0.230
MWS-L-8-12	8' x 12'	151	0.346
MWS-L-8-16	8' x 16'	201	0.462
MWS-L-8-20	9' x 21'	252	0.577
MWS-L-8-24	9' x 25'	302	0.693
MWS-L-10-20	10' x 20'	302	0.693

VOLUME-BASED DESIGNS

HORIZONTAL FLOW BIOFILTRATION ADVANTAGE

Modular Wetlands® with
Box Culvert Prestorage

The Modular Wetlands® System Linear offers a unique advantage in the world of biofiltration due to its exclusive horizontal flow design: Volume-Based Design. No other biofilter has the ability to be placed downstream of detention ponds, extended dry detention basins, underground storage systems and permeable paver reservoirs. The systems horizontal flow configuration and built-in orifice control allows it to be installed with just 6" of fall between inlet and outlet pipe for a simple connection to projects with shallow downstream tie-in points. In the example above, the Modular Wetlands® is installed downstream of underground box culvert storage. Designed for the water quality volume, the Modular Wetlands® will treat and discharge the required volume within local draindown time requirements.

Modular Wetlands® with
Arch Plastic Chambers

DESIGN SUPPORT

Bio Clean engineers are trained to provide you with superior support for all volume sizing configurations throughout the country. Our vast knowledge of state and local regulations allow us to quickly and efficiently size a system to maximize feasibility. Volume control and hydromodification regulations are expanding the need to decrease the cost and size of your biofiltration system. Bio Clean will help you realize these cost savings with the Modular Wetlands®, the only biofilter than can be used downstream of storage BMPs.

ADVANTAGES

- LOWER COST THAN FLOW-BASED DESIGN
- MEETS LID REQUIREMENTS
- BUILT-IN ORIFICE CONTROL STRUCTURE
- WORKS WITH DEEP INSTALLATIONS

MWS Linear 2.0 HGL Sizing Calculations

WS MODEL SIZE	WETLAND PERMITER LENGTH	LOADING RATE GPM/SF	HGL HEIGHT																														
			SHALLOW MODELS																					STANDARD HEIGHT MODEL	HIGH CAPACITY MODELS									
			1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.65	3.70	3.75	3.80	3.85	3.90	3.9
MWS-L-4-4	6.70	1.0	0.022	0.023	0.025	0.026	0.028	0.029	0.031	0.032	0.034	0.035	0.037	0.038	0.040	0.042	0.043	0.045	0.046	0.048	0.049	0.051	0.052	0.054	0.055	0.056	0.057	0.058	0.058	0.059	0.060	0.0
MWS-L-3-6	10.06	1.0	0.032	0.035	0.037	0.039	0.042	0.044	0.046	0.048	0.051	0.053	0.055	0.058	0.060	0.062	0.065	0.067	0.069	0.072	0.074	0.076	0.078	0.081	0.083	0.084	0.085	0.087	0.088	0.089	0.090	0.0
MWS-L-4-6	9.30	1.0	0.030	0.032	0.034	0.036	0.038	0.041	0.043	0.045	0.047	0.049	0.051	0.053	0.055	0.058	0.060	0.062	0.064	0.066	0.068	0.070	0.073	0.075	0.077	0.078	0.079	0.080	0.081	0.082	0.083	0.0
MWS-L-4-8	14.80	1.0	0.048	0.051	0.054	0.058	0.061	0.065	0.068	0.071	0.075	0.078	0.082	0.085	0.088	0.092	0.095	0.099	0.102	0.105	0.109	0.112	0.115	0.119	0.122	0.124	0.126	0.127	0.129	0.131	0.132	0.1
MWS-L-4-13	18.40	1.0	0.059	0.063	0.068	0.072	0.076	0.080	0.084	0.089	0.093	0.097	0.101	0.106	0.110	0.114	0.118	0.122	0.127	0.131	0.135	0.139	0.144	0.148	0.152	0.154	0.156	0.158	0.160	0.163	0.165	0.1
MWS-L-4-15	22.40	1.0	0.072	0.077	0.082	0.087	0.093	0.098	0.103	0.108	0.113	0.118	0.123	0.129	0.134	0.139	0.144	0.149	0.154	0.159	0.165	0.170	0.175	0.180	0.185	0.188	0.190	0.193	0.195	0.198	0.200	0.2
MWS-L-4-17	26.40	1.0	0.085	0.091	0.097	0.103	0.109	0.115	0.121	0.127	0.133	0.139	0.145	0.151	0.158	0.164	0.170	0.176	0.182	0.188	0.194	0.200	0.206	0.212	0.218	0.221	0.224	0.227	0.230	0.233	0.236	0.2
MWS-L-4-19	30.40	1.0	0.098	0.105	0.112	0.119	0.126	0.133	0.140	0.147	0.153	0.160	0.167	0.174	0.181	0.188	0.195	0.202	0.209	0.216	0.223	0.230	0.237	0.244	0.251	0.255	0.258	0.262	0.265	0.269	0.272	0.2
MWS-L-4-21	34.40	1.0	0.111	0.118	0.126	0.134	0.142	0.150	0.158	0.166	0.174	0.182	0.189	0.197	0.205	0.213	0.221	0.229	0.237	0.245	0.253	0.261	0.268	0.276	0.284	0.288	0.292	0.296	0.300	0.304	0.308	0.3
MWS-L-6-8	18.80	1.0	0.060	0.065	0.069	0.073	0.078	0.082	0.086	0.091	0.095	0.099	0.104	0.108	0.112	0.116	0.121	0.125	0.129	0.134	0.138	0.142	0.147	0.151	0.155	0.157	0.160	0.162	0.164	0.166	0.168	0.1
MWS-L-8-8	29.60	1.0	0.095	0.102	0.109	0.115	0.122	0.129	0.136	0.143	0.149	0.156	0.163	0.170	0.177	0.183	0.190	0.197	0.204	0.211	0.217	0.224	0.231	0.238	0.245	0.248	0.251	0.255	0.258	0.262	0.265	0.2
MWS-L-8-12	44.40	1.0	0.143	0.153	0.163	0.173	0.183	0.194	0.204	0.214	0.224	0.234	0.245	0.255	0.265	0.275	0.285	0.296	0.306	0.316	0.326	0.336	0.346	0.357	0.367	0.372	0.377	0.382	0.387	0.392	0.397	0.4
MWS-L-8-16	59.20	1.0	0.190	0.204	0.217	0.231	0.245	0.258	0.272	0.285	0.299	0.312	0.326	0.340	0.353	0.367	0.380	0.394	0.408	0.421	0.435	0.448	0.462	0.476	0.489	0.496	0.503	0.509	0.516	0.523	0.530	0.5
MWS-L-8-20	74.00	1.0	0.238	0.255	0.272	0.289	0.306	0.323	0.340	0.357	0.374	0.391	0.408	0.425	0.442	0.459	0.476	0.493	0.509	0.526	0.543	0.560	0.577	0.594	0.611	0.620	0.628	0.637	0.645	0.654	0.662	0.6
MWS-L-10-20 or MWS-L-8-24	88.80	1.0	0.285	0.306	0.326	0.346	0.367	0.387	0.408	0.428	0.448	0.469	0.489	0.509	0.530	0.550	0.571	0.591	0.611	0.632	0.652	0.673	0.693	0.713	0.734	0.744	0.754	0.764	0.774	0.785	0.795	0.8
4'x'4 media cage	14.80	1.0	0.048	0.051	0.054	0.058	0.061	0.065	0.068	0.071	0.075	0.078	0.082	0.085	0.088	0.092	0.095	0.099	0.102	0.105	0.109	0.112	0.115	0.119	0.122	0.124						

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Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

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

Project Name: BDM Mixed Use

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☑ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☑ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☑ Not Performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	☑ Included ☐ Submitted as separate stand-alone document

Project Name: BDM Mixed Use

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

The Hydromodification Management Exhibit must identify:

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

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BMP Applicability and Selection for Green Street Exemption	Form J-1
Project Identification	
Project Name: BDM Mixed Use	
Permit Application Number:	Date: 06/02/2021
Project Characterization and Selection Synopsis	
The purpose of this form is to guide the selection of BMPs, given project specific constraints to meet the Green Streets exemption as defined in Appendix J.2 of the BMP Design Manual. In order to qualify for a PDP exemption, the project must incorporate all applicable Green Street BMP elements described in Appendix J.2, based on the applicability guidance provided in Appendix J.2. Complete the sections below providing detailed justification for each selection.	
Step 1: Does this project include retrofitting or redevelopment of an existing alley, street, or roadway criteria? Exemptions do not apply for projects that construct new alleys, streets, or roadways. See Appendix J for additional guidance on distinguishing between redevelopment of a street and new development. ☑ Yes ☐ No (if No is selected, the Green Street exemption is not applicable)	
Provide a brief overview of the project, key details, and site-specific opportunities and constraints: The project proposes the widening of Otay Mesa Road; Constructing sidewalk, parkway strips, and curb and gutter. Opportunities for Green Streets Infrastructure is limited to the proposed parkway strips adjacent to the roadway.	
Step 2: Complete the BMP-specific applicability checklists on the following pages and attach them to this form. Complete forms for all BMPs, including those that were used and those that were not used.	
Step 3: Summarize the BMP(s) that were selected through the guidance process (Select all that apply):	

BMP Type	Applicable?	Used?	Summary of justification for Inclusion or Finding of Non-applicability
Vegetated Swales	☑	☑	key opportunities and flat slopes are present. Provides conveyance
Sidewalk Planters	☑	☐	Not used - BSM not recommended adjacent to curb on narrow pkwy.
Curb Extensions	☑	☐	Not used - Traffic calming not desired for roadway type.
Permeable Surfaces	☑	☐	Not used - High traffic areas are unfavorable conditions.
Green Gutters	☑	☐	This is similar to the vegetated swale concept selected
Rain Gardens	☑	☐	Not used - BSM not recommended adjacent to curb on narrow pkwy.
Trees	☑	☑	Key opportunities are present. Incorporated into the parkway vegetated swales.
Other_____	☐	☐	

Form J-1 Page 2 of 8: Vegetated Swale

Brief Description: Vegetated Swales are shallow, open channels that are designed to remove storm water pollutants by physically straining/filtering runoff through vegetation in the channel.

Site Type (Check all that apply):	Street Type	Rating[26]	Present in Project?
	Residential Streets	◉	☐
	Commercial Street/ Business District	○	☐
	Collector Street	◉	☐
	Arterial and Boulevard	◉	☑
	Alleys	○	☐
	Parking Areas	◉	☐
Key Opportunities for Vegetated Swales (Check all that apply):	Parkway strips		☑
	Medians		☐
	Long, mostly continuous space		☑
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Vegetated Swales		
	Slope > 1% and <3%		☑
	Conveying run-on to a site		☑
	Infiltration is partially feasible or not feasible		☑
	Long continuous segments available		☑
	More parkway width		☐
	Unfavorable Conditions for Vegetated Swales		
	Available width is < 8 feet		☑
	Frequent driveway interruption		☐
	ROW width too limited		☐

Summary of Findings:

Were Vegetated Swales determined to be applicable as part of the Green Streets BMP plan? ☑ Yes ☐ No	If yes, were they used? ☑ Yes ☐ No

Provide discussion/justifications for selections and decisions above:

Flatter slopes are present along the long stretches of proposed parkway strips. Infiltration is not recommended. Vegetated swales will receive run-on from the adjacent roadway and convey it toward the storm drain system while providing incidental water quality benefit. Therefore, this strategy was selected.

[26] ● High applicability within this category, however may still be limited by site-specific factors
◉ Generally applicable in this category; largely dependent on site-specific factors
○ Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 3 of 8: Sidewalk Planters			
Brief Description: A planter imbedded in the sidewalk designed to manage storm water runoff from the adjacent roadway and sidewalk.			
Site Type (Check all that apply):	Street Type	Rating[27]	Present in Project?
	Residential Streets	◉	☐
	Commercial Street/ Business District	◉	☐
	Collector Street	●	☐
	Arterial and Boulevard	●	☑
	Alleys	○	☐
	Parking Areas	◉	☐
Key Opportunities for Sidewalk Planters (Check all that apply):	Parkway strips		☑
	Medians		☐
	Between driveways		☐
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Sidewalk Planters		
	Slope <4%		☑
	Wide sidewalks		☐
	More parkway width		☐
	Unfavorable Conditions for Sidewalk Planters		
	Conflicts with car egress		☐
	ROW width too limited		☑

Summary of Findings:

Were Sidewalk Planters determined to be applicable as part of the Green Streets BMP plan?	If yes, were they used?
☑ Yes ☐ No	☐ Yes ☑ No

Provide discussion/justifications for selections and decisions above:

Uncompacted Amended soils or biofiltration soil mix associated with sidewalk planters are not recommended immediately adjacent to the curb due to structural concerns for the curb. A 'buffer zone' of native or compacted soil between the curb and any loose amended/biofiltration soil is recommended (Based on previous experience, typically 2' is recommended as a buffer before placing any amended soil/BSM).

With the proposed 5' wide parkway strip (4.5' effective pervious area), this strategy was not considered to be feasible.

[27] ● High applicability within this category, however may still be limited by site-specific factors
◉ Generally applicable in this category; largely dependent on site-specific factors
○ Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 4 of 8: Curb Extensions			
Brief Description: Curb extensions expand the edge of the sidewalk into the roadway or parking area and allow storm water runoff to collect and infiltrate through a detention area of porous media.			
Site Type (Check all that apply):	Street Type	Rating[28]	Present in Project?
	Residential Streets	●	☐
	Commercial Street/ Business District	●	☐
	Collector Street	◉	☐
	Arterial and Boulevard	◉	☑
	Alleys	○	☐
	Parking Areas	◉	☐
Key Opportunities for Curb Extensions (Check all that apply):	Intersections		☐
	Parking area		☐
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Curb Extensions		
	Slope <4%		☑
	Traffic calming needed		☐
	Unfavorable Conditions for Curb Extensions		
	Conflicts with bike lanes		☐
	Site distance issues at intersection		☐

Summary of Findings:

Were Curb Extensions determined to be applicable as part of the Green Streets BMP plan?	If yes, were they used?
☑ Yes ☐ No	☐ Yes ☑ No

Provide discussion/justifications for selections and decisions above:

Curb extension opportunities along the parkway adjacent to Otay Mesa Road are not in line with the street classification as traffic calming/restriction is not typically desired on these road types. Therefore, this strategy was not selected.

[28] ● High applicability within this category, however may still be limited by site-specific factors
◉ Generally applicable in this category; largely dependent on site-specific factors
○ Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 5 of 8: Permeable Surfaces

Brief Description: Permeable surfaces are pavement that allows for percolation through void spaces into subsurface layers.

Site Type (Check all that apply):	Street Type	Rating[29]	Present in Project?
	Residential Streets	●	☐
	Commercial Street/ Business District	●	☐
	Collector Street	◉	☐
	Arterial and Boulevard	◉	☑
	Alleys	●	☐
	Parking Areas	◉	☐
Key Opportunities for Permeable Surfaces (Check all that apply):	Sidewalks		☑
	Parking strips		☐
	Shoulders		☑
	Low traffic roadways		☐
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Permeable Surfaces		
	Slope < 2-3%		☑
	Conveying limited run-on to a site		☐
	Low traffic area		☐
	Unfavorable Conditions for Permeable Surfaces		
	High traffic area		☑
	Run-on has high sediment load		☐

Summary of Findings:

Were Permeable Surfaces determined to be applicable as part of the Green Streets BMP plan? ☑ Yes ☐ No	If yes, were they used? ☐ Yes ☑ No

Provide discussion/justifications for selections and decisions above:

Key opportunities are present along the sidewalks and shoulders. However, the proposed road widening is in a high traffic area which is an unfavorable condition for permeable surfaces. Therefore, this strategy was not selected.

[29] ● High applicability within this category, however may still be limited by site-specific factors
◉ Generally applicable in this category; largely dependent on site-specific factors
○ Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 6 of 8: Green Gutters

Brief Description: Green Gutters are shallow and narrow strips of landscaping in a typical curb and gutter location with a lower elevation than the street gutter elevation to allow capture of storm water from the sidewalk and street.

Site Type (Check all that apply):	Street Type	Rating[30]	Present in Project?
	Residential Streets	○	☐
	Commercial Street/ Business District	◉	☐
	Collector Street	●	☐
	Arterial and Boulevard	●	☑
	Alleys	◉	☐
	Parking Areas	○	☐
Key Opportunities for Green Gutters (Check all that apply):	Parkway strips		☑
	Medians		☐
	Long, mostly continuous space		☑
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Green Gutters		
	Slope > 1% and <3%		☑
	Conveying run-on to a site		☑
	Infiltration is partially feasible or not feasible		☑
	Long continuous segments available		☑
	Narrower spaces (as little as 2 to 3 feet)		☑
	Unfavorable Conditions for Green Gutters		
	Frequent driveway interruption		☐
	ROW width too limited		☐

Summary of Findings:

Were Green Gutters determined to be applicable as part of the Green Streets BMP plan? ☑ Yes ☐ No	If yes, were they used? ☐ Yes ☑ No

Provide discussion/justifications for selections and decisions above:

Key opportunities and favorable conditions are present. This is similar to a vegetated swale which has been selected.

[30] ● High applicability within this category, however may still be limited by site-specific factors
◉ Generally applicable in this category; largely dependent on site-specific factors
○ Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 7 of 8: Rain Gardens

Brief Description: Rain Gardens are shallow detention basins with vegetation that temporarily store water to allow for infiltration of the stored volume. Rain Gardens could be a bioretention or a biofiltration with partial retention or a biofiltration BMP.

Site Type (Check all that apply):	Street Type	Rating[31]	Present in Project?
	Residential Streets	◉	☐
	Commercial Street/ Business District	◉	☐
	Collector Street	◉	☐
	Arterial and Boulevard	◉	☑
	Alleys	○	☐
	Parking Areas	●	☐
Key Opportunities for Rain Gardens (Check all that apply):	Irregularly shaped areas in ROW		☐
	Broad and flat areas		☐
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Rain Gardens		
	Slope <2%		☑
	Infiltration is partially feasible or not feasible		☑
	Large area available		
	Unfavorable Conditions for Rain Gardens		
	Slope > 2%		☐
	ROW too limited		☑

Summary of Findings:

Were Rain Gardens determined to be applicable as part of the Green Streets BMP plan? ☑ Yes ☐ No	If yes, were they used? ☐ Yes ☑ No

Provide discussion/justifications for selections and decisions above:

Favorable conditions are present. However, the ROW is too limited. Uncompacted Amended soils or biofiltration soil mix associated with rain gardens are not recommended within a high traffic area immediately adjacent to the curb due to structural concerns for the curb. A 'buffer zone' of native or compacted soil between the curb and any loose amended/biofiltration soil is recommended (Based on previous experience, typically 2' is recommended as a buffer before placing any amended soil/BSM).

With the proposed 5' wide parkway strip (4.5' effective pervious area), this strategy was not considered to be feasible.

[31] ● High applicability within this category, however may still be limited by site-specific factors
◉ Generally applicable in this category; largely dependent on site-specific factors
○ Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 8 of 8: Trees

Brief Description: Trees planted in the sidewalk right-of-way provide rainfall interception and infiltration benefits and typically supplements other storm water management tools.

Site Type (Check all that apply):	Street Type	Rating[32]	Present in Project?
	Residential Streets	●	☐
	Commercial Street/ Business District	◉	☐
	Collector Street	◉	☐
	Arterial and Boulevard	◉	☑
	Alleys	◉	☐
	Parking Areas	●	☐
Key Opportunities for Trees (Check all that apply):	Parkway strips		☑
	Medians		☐
	Irregularly shaped areas		☐
	Extra ROW on back side of sidewalk		☐
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Trees		
	Located outside of clear zone		☑
	Infiltration is feasible		☐
	ROW not limiting		
	Unfavorable Conditions for Trees		
	Limited space for root growth		☐
	Clear zone issues		☐

Summary of Findings:

Were Trees determined to be applicable as part of the Green Streets BMP plan? ☑ Yes ☐ No	If yes, were they used? ☑ Yes ☐ No

Provide discussion/justifications for selections and decisions above:

Key opportunities and favorable conditions are present. Street trees have been selected and incorporated in the parkway design along with vegetated swales.

[32] ● High applicability within this category, however may still be limited by site-specific factors
◉ Generally applicable in this category; largely dependent on site-specific factors
○ Limited applicability within this category; may still be applicable in some cases; should be considered

Attachment 2a

LEGEND

PROJECT BOUNDARY

DRAINAGE BOUNDARY

FLOW DIRECTION

00.00 ACRES — AREA

D — HYDROLOGIC SOIL TYPE

1 — POINT OF COMPLIANCE

LEGEND

DMA 2
0.91 ACRES

DMA 1
12.76 ACRES

UNDERLYING SOIL GROUP : D
APPROXIMATE DEPTH TO GROUNDWATER > 20'
NO CRITICAL COARSE AREAS REQUIRE PRESERVATION

60 0 60 120 180
SCALE 1" = 60'

PREPARED BY:
HUNSAKER & ASSOCIATES SAN DIEGO, INC.
PLANNING 9707 Waples Street
ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500- FX(858)558-1414

PRE-DEVELOPED
HYDROMODIFICATION MAP

BDM MIXED USE

CITY OF SAN DIEGO, CALIFORNIA

MAP 1 OF 1

W.O.# 3592-0001

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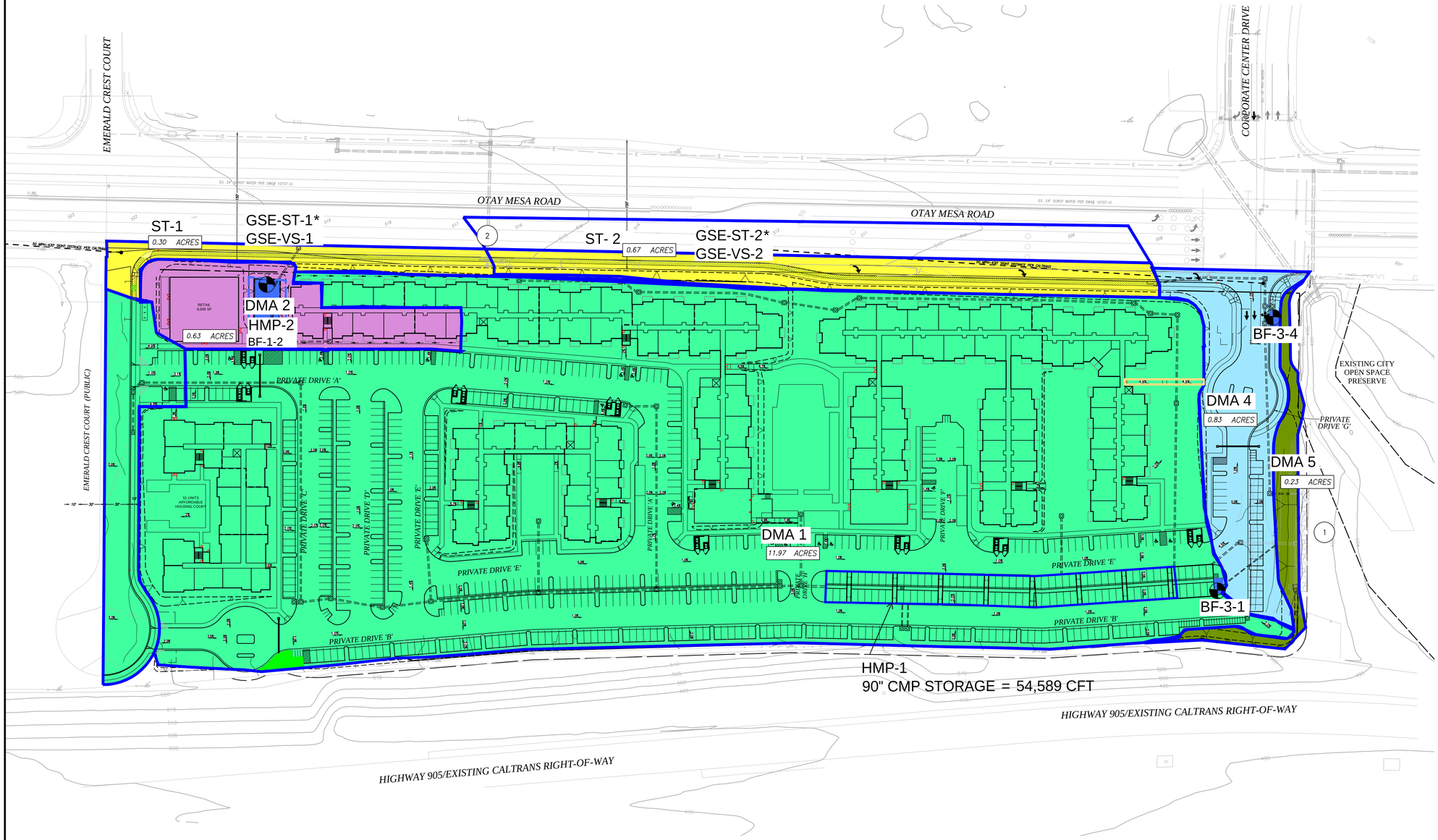

LEGEND

- PROJECT BOUNDARY
- DMA BOUNDARY
- 00.00 ACRES — SUBAREA ACREAGE
- DMA 1 — DMA ICON
- DMA1 - AREA DRAINS TO VAULT - MIXED USE SITE
- DMA2 - AREA DRAINS TO BIOFILTRATION BASIN
- DMA4- PUBLIC STREET
- DMA 3- SELF-MITIGATION PERVIOUS AREA
- ST-1 - GREEN STREET
- D — HYDROLOGIC SOIL TYPE
- 1 — POINT OF COMPLIANCE
- STRUCTURAL BMP

UNDERLYING SOIL GROUP : D
APPROXIMATE DEPTH TO GROUNDWATER > 20'
NO CRITICAL COARSE AREAS REQUIRE PRESERVATION

PREPARED BY:
HUNSAKER & ASSOCIATES SAN DIEGO, INC
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ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 FX(858)558-1414

PROPOSED
HYDROMODIFICATION MAP

BDM MIXED USE

CITY OF SAN DIEGO, CALIFORNIA

MAP 1 OF 1

W.O.# 3592-0002

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Attachment 2B

ROCKBLUFF WY
EMERALD CREST
SURFRIDER WY
SURFRIDER WY
OTAY MESA RD
OTAY MESA RD
OTAY MESA RD
CORPORATE CENTER DR
APN: 645-080-18
APN: 645-090-51
SR-905 WB
SR-905 EB

Legend

- <all other values>

CCSYA Slope type

- 0 (Outside Project limits)
- 1 (Draining to BMP)
- 2 (Fill Slope)
- 3 (Existing)

Topo_2014_2Ft_NationalCity INDEX

- Major Contour
- Minor Contour
- Property

\\SRV_R181\proj\data\18157-Handler_Commercial\GIS\18157_CCSYA_v10.mxd

RICK ENGINEERING COMPANY

Scale in Feet
0 130 260
North

Date of Exhibit: 3/4/2018
SanGIS PCCSY: 03/2015
FEMA NFHL: 04/2016
SanGIS/USGS Aerial Imagery: 11/2014

Handler Commercial

Remaining CCSYA Exhibit

JN: 18157

Attachment 2D

Hydromodification Management Plan

1.0 INTRODUCTION

The BDM Mixed Use project (herein referred to as "project") is a proposed mixed use development located in Otay Mesa, south of Otay Mesa Road and North of State Route (SR) 905, within the City of San Diego, CA. The site is currently undeveloped (mass graded pads) and has area of approximately 14 acres.

The purpose of this report is to document the methods, parameters, and results of the hydromodification analysis, which was performed pursuant to the guidance described in the City of San Diego Storm Water Standards Manual Part 1: BMP Design Manual, dated October, 2018 (herein referred to as "BMP Design Manual")(City of San Diego, 2018).

The scope of the report includes:

1. General Methodology
2. Pre-developed condition analysis
3. Post-project condition analysis

2.0 GENERAL METHODOLOGY

In accordance with the BMP Design Manual a hydromodification management analysis was performed to demonstrate that flows at the points of compliance (POC) in the post-project condition will not be greater than flows at the POCs in the pre-developed condition for both the peak flow rates and duration for the range of flows of concern. The site drains in two directions in the existing condition, with two POC's which have been identified; one located at the upstream portion of a storm drain which flows north across Otay Mesa Road, and another POC located to the east, draining into a natural canyon. For the purpose of comparing flow frequency and duration between pre-development and post-project conditions, these two POCs will be analyzed.

The ranges of flows of concern for this project are between 10% of the 2-year peak flow and the 10-year peak flow. The pre-development and post-project conditions were analyzed via continuous simulation modeling performed using the US Environmental Protection Agency (EPA) Storm Water Management Model (SWMM) 5.1. Lindbergh Rain Gage data, obtained from the Project Clean Water website (http://www.projectcleanwater.org/), was incorporated into the SWMM analysis. Hourly data from the SWMM modeling were exported to Excel spreadsheets for post-processing analysis. Based on the data presented in the Excel spreadsheets, BMP parameters were adjusted until the management criteria were met (i.e., orifice diameters and basin depths were designed through iterative modeling process, post-processing, and parameter adjustments).

3.0 PRE-DEVELOPED CONDITION MODELING

3-1 DRAIANGE AREA DELINEATIONS

Based on the project topographic survey, the pre-developed (existing) condition drainage area was determined for the site. For the purpose of the hydromodification management analysis, the drainage management areas (DMAs) that include areas of improvements (e.g., houses, roads, sidewalks, etc.) were compared to the same area in the pre-developed condition. As such, the post-project DMAs 1 - 4 were overlain on the existing condition drainage map to determine areas, soil groups, and slope parameters that were then incorporated into the pre-developed condition SWMM model. This analysis excluded DMAs identified as HMP exempt per the exemption requirements detailed in the City of San Diego Storm Water Standards Manual. The current regulations and guidance require that the pre-developed condition area be incorporated into modeling with zero impervious cover. Table 3-1 provides a summary of the pre-project areas. The Hydromodification Management Exhibit is provided in Attachment 2 of the PDP SWQMP and shows the areas.

Table 3-1. Subarea Summary

POC ID	DMA ID	Pervious Area (Acres)	Impervious Area (Acres)	Total Area (Acres)	Imperviousness %
POC 1	DMA 1	12.74	0	12.74	0
POC 2	DMA 2	0.91	0	0.91	0

3-2 Catchment Modeling Parameters

In accordance the Table G.1-4 of the BMP Design Manual, the parameters presented in Table 3-2 were incorporated into the SWMM analysis for the pre-developed condition.

Table 3-2. Summary of Pre-Developed Condition SWMM Catchment Parameters

Parameter	Value	Notes
% Imperv	0%	
N-Imperv	0.012	Manning's n for impervious.
N-Perv	0.10	Manning's n for pervious. (Table 3-5 of SWMM Hydrology Manual – "Short Grass Prairie")
Dstore-Imperv	0.05	Depth of depression storage on impervious portion.
Dstore-Perv	0.10	Depth of depression storage on pervious portion.
Subarea Routing	Outlet	
Infiltration Method	Green-Ampt	
Suction Head	9.0	Soil capillary suction head.
Conductivity	0.025 in/hr (0.01875 in/hr)	Soil saturated hydraulic conductivity. (Hydrologic soil group D)
Initial Deficit	0.30	Difference between soil porosity and initial moisture content (a fraction) (Hydrologic soil group D)
Evaporation	CIMIS Zone 6 Values	

4.0 POST-DEVELOPED CONDITION MODELING

4-1 DRAIANGE AREA DELINEATIONS

Based on the proposed project topography, the post-developed condition drainage areas were determined for the site. The areas where impervious improvements are proposed were divided into five (4) DMAs with two POCs. Based on the proposed improvements, the impervious areas, and pervious areas were determined. Table 4-1 provides a summary of the post-project areas. The Hydromodification Management Exhibit is provided in Attachment 2 of PDP SWQMP and shows the areas.

Table 4-1. Subarea Summary

POC ID	DMA ID	Pervious Area (Acres)	Impervious Area (Acres)	Total Area (Acres)	Imperviousness %
POC 1	DMA 1	3.19	8.78	11.97	73.38
	DMA 3	0.232	0	0.232	0
	DMA 4	0.29	0.54	0.825	64.96
POC 2	BF-1-2	0.051	0	0.051	0
	DMA 2	0.19	0.39	0.58	67.4

4-2 Catchment Modeling Parameters

In accordance the Table G.1-4 of the BMP Design Manual, the parameters presented in Table 4-2 on the following page were incorporated into the SWMM analysis for the post-project condition.

Table 4-2. Summary of Post-Project Condition SWMM Catchment Parameters

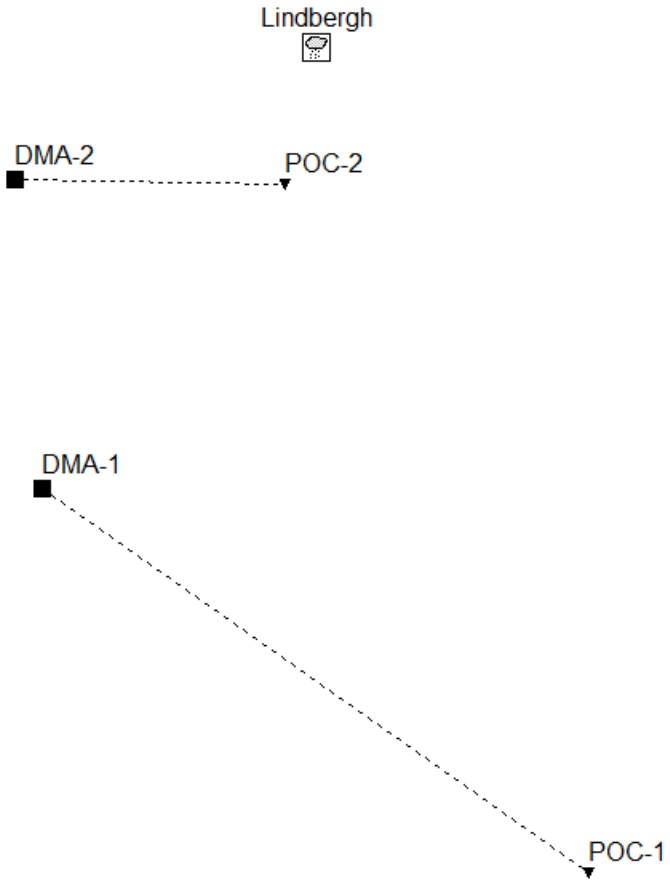
Parameter	Value	Notes
% Imperv	Varies	See Table 4-1.
N-Imperv	0.012	Manning's n for impervious.
N-Perv	0.10	Manning's n for pervious. (Table 3-5 of SWMM Hydrology Manual – "Short Grass Prairie")
Dstore-Imperv	0.05	Depth of depression storage on impervious portion.
Dstore-Perv	0.10	Depth of depression storage on pervious portion.
Subarea Routing	Outlet	
Infiltration Method	Green-Ampt	
Suction Head	9.0	Soil capillary suction head. (soil group D)
Conductivity	0.01875 in/hr	Soil saturated hydraulic conductivity with 25% reduction due to compaction. (Hydrologic soil group D)
Initial Deficit	0.30	Difference between soil porosity and initial moisture content (a fraction) (Hydrologic soil group D)
Evaporation	CIMIS Zone 6 Values	

5.0 SUMMARY

A hydromodification management analysis was performed in accordance with the BMP Design Manual using SWMM software. The results of the analysis indicate that proposed project as

design complies with the current hydromodification management criteria. Compliance has been demonstrated through proposed implementation of one under ground vault (to POC 1) and one biofiltration basin (to POC 2) throughout the site. The basin has been designed to provide water quality pollutant control, hydromodification management, and flood control and conveyance. The Vault has been designed to provide hydromodification management, and flood control and conveyance. Following this report are the results of the SWMM analysis.

SWMM Model Schematics
Pre-Development Model



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

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

START_DATE           10/17/1948
START_TIME           08:00:00
REPORT_START_DATE    10/17/1948
REPORT_START_TIME    08:00:00
END_DATE             12/31/2005
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          01:00:00
WET_STEP             00:15:00
DRY_STEP             01:00:00
ROUTING_STEP         0:01:00

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

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
MONTHLY          .06    .08    .11    0.16   0.18   0.21   0.21   0.2    0.16   0.12   .08    .06
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- ------ ------ ----------
```

```
Lindbergh        VOLUME    1:00     1.0      TIMESERIES Lindbergh

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------------
;BDM Mixed Use
DMA-1            Lindbergh        POC-1            12.74    0        1112     4.6      0
DMA-2            Lindbergh        POC-2            0.91     0        450      2.1      0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
DMA-1            0.012      0.10       0.05       0.1        25         OUTLET
DMA-2            0.012      0.1        0.05       0.10       25         OUTLET

[INFILTRATION]
;;Subcatchment   Suction    Ksat       IMD
;;-------------- ---------- ---------- ----------
DMA-1            9          0.025      0.3
DMA-2            9          0.025      0.3

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
POC-1            0          FREE                        NO
POC-2            0          FREE                        NO

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Lindbergh
Lindbergh        FILE "LbergRain.dat"

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 370.141 4295.274 847.527 4772.674
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
```

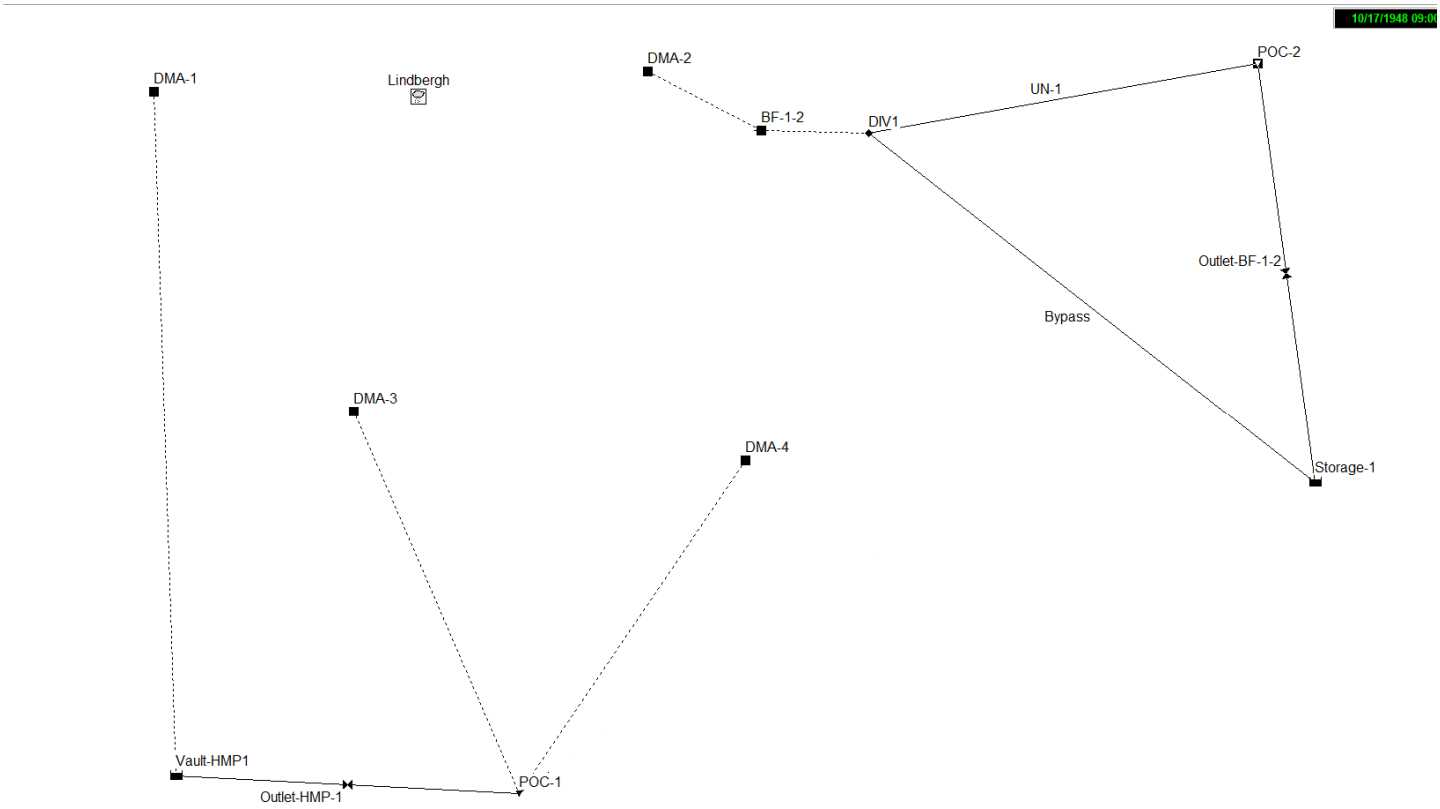
```
;;-------------- ------------------ ------------------
POC-1            603.310            4321.314
POC-2            452.999            4660.868

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------

[Polygons]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
DMA-1            333.772            4510.970
DMA-2            319.704            4662.850

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
Lindbergh        470.314            4727.160
```

Post-Development Model



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

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

START_DATE           10/17/1948
START_TIME           08:00:00
REPORT_START_DATE    10/17/1948
REPORT_START_TIME    08:00:00
END_DATE             12/31/2005
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          01:00:00
WET_STEP             00:15:00
DRY_STEP             01:00:00
ROUTING_STEP         0:01:00

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

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
MONTHLY          .06    .08    .11    0.16   0.18   0.21   0.21   0.2    0.16   0.12   .08    .06
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- ------ ------ ----------
```

```
Lindbergh        VOLUME    1:00     1.0      TIMESERIES Lindbergh

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------------
;Corporate Center Drive
DMA-4            Lindbergh        POC-1            0.825    64.96    692      1        0
;BDM Mixed Use
DMA-1            Lindbergh        Vault-HMP1       11.97    73.38    386      1        0
;SELF MITIGATINF SLOPES
DMA-3            Lindbergh        POC-1            0.232    0        349      50       0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
DMA-4            0.012      0.10       0.05       0.1        25         OUTLET
DMA-1            0.012      0.10       0.05       0.1        25         OUTLET
DMA-3            0.012      0.1        0.05       0.10       25         OUTLET

[INFILTRATION]
;;Subcatchment   Suction    Ksat       IMD
;;-------------- ---------- ---------- ----------
DMA-4            9          0.01875    0.30
DMA-1            9          0.01875    0.3
DMA-3            9          0.025      0.3

[LID_CONTROLS]
;;Name           Type/Layer Parameters
;;-------------- ---------- ----------
BF-1-2           BC
BF-1-2           SURFACE    6          0.0        0          0          5
BF-1-2           SOIL       24         0.4        0.2        0.1        5          5          1.5
BF-1-2           STORAGE    12         0.67       0          0
BF-1-2           DRAIN      0.1456     0.5        3          6

[LID_USAGE]
;;Subcatchment   LID Process      Number  Area       Width      InitSat    FromImp    ToPerv     RptFile
DrainTo
;;-------------- ---------------- ------- ---------- ---------- ---------- ---------- ---------- ------------------------
----------------

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
POC-1            0          FREE                        NO

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat
IMD
```

```
;;-------------- -------- ---------- ---------- ---------- -------------------------- -------- --------          --------
--------
;Vault HMP-1
Vault-HMP1       0        6.6        0          TABULAR    Storage-HMP-1               14290    1

[OUTLETS]
;;Name           From Node        To Node          Offset     Type            QTable/Qcoeff    Qexpon     Gated
;;-------------- ---------------- ---------------- ---------- --------------- ---------------- ---------- --------
Outlet-HMP-1     Vault-HMP1       POC-1            0          TABULAR/DEPTH   Outlet-HMP-1                NO

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
Outlet-HMP-1     Rating     0.00       0.0000
Outlet-HMP-1                0.02       0.0006
Outlet-HMP-1                0.04       0.0024
Outlet-HMP-1                0.06       0.0053
Outlet-HMP-1                0.08       0.0092
Outlet-HMP-1                0.10       0.0141
Outlet-HMP-1                0.12       0.0197
Outlet-HMP-1                0.14       0.0261
Outlet-HMP-1                0.16       0.0330
Outlet-HMP-1                0.17       0.0366
Outlet-HMP-1                0.18       0.0404
Outlet-HMP-1                0.20       0.0482
Outlet-HMP-1                0.22       0.0561
Outlet-HMP-1                0.24       0.0615
Outlet-HMP-1                0.26       0.0659
Outlet-HMP-1                0.28       0.0700
Outlet-HMP-1                0.30       0.0738
Outlet-HMP-1                0.32       0.0775
Outlet-HMP-1                0.33       0.0799
Outlet-HMP-1                0.34       0.0810
Outlet-HMP-1                0.36       0.0844
Outlet-HMP-1                0.38       0.0876
Outlet-HMP-1                0.40       0.0908
Outlet-HMP-1                0.42       0.0938
Outlet-HMP-1                0.44       0.0967
Outlet-HMP-1                0.46       0.0995
Outlet-HMP-1                0.48       0.1023
Outlet-HMP-1                0.50       0.1050
Outlet-HMP-1                0.52       0.1076
Outlet-HMP-1                0.54       0.1102
Outlet-HMP-1                0.56       0.1127
Outlet-HMP-1                0.58       0.1151
Outlet-HMP-1                0.60       0.1175
Outlet-HMP-1                0.62       0.1198
Outlet-HMP-1                0.64       0.1222
Outlet-HMP-1                0.66       0.1244
```

Outlet-HMP-1	0.67	0.1255
Outlet-HMP-1	0.68	0.1266
Outlet-HMP-1	0.70	0.1288
Outlet-HMP-1	0.72	0.1310
Outlet-HMP-1	0.74	0.1331
Outlet-HMP-1	0.76	0.1351
Outlet-HMP-1	0.78	0.1372
Outlet-HMP-1	0.80	0.1392
Outlet-HMP-1	0.82	0.1412
Outlet-HMP-1	0.83	0.1425
Outlet-HMP-1	0.84	0.1431
Outlet-HMP-1	0.86	0.1451
Outlet-HMP-1	0.88	0.1470
Outlet-HMP-1	0.90	0.1489
Outlet-HMP-1	0.92	0.1507
Outlet-HMP-1	0.94	0.1526
Outlet-HMP-1	0.96	0.1544
Outlet-HMP-1	0.98	0.1562
Outlet-HMP-1	1.00	0.1579
Outlet-HMP-1	1.02	0.1597
Outlet-HMP-1	1.04	0.1614
Outlet-HMP-1	1.06	0.1631
Outlet-HMP-1	1.08	0.1648
Outlet-HMP-1	1.10	0.1665
Outlet-HMP-1	1.12	0.1682
Outlet-HMP-1	1.14	0.1698
Outlet-HMP-1	1.16	0.1715
Outlet-HMP-1	1.17	0.1720
Outlet-HMP-1	1.18	0.1731
Outlet-HMP-1	1.20	0.1747
Outlet-HMP-1	1.22	0.1763
Outlet-HMP-1	1.24	0.1778
Outlet-HMP-1	1.26	0.1794
Outlet-HMP-1	1.28	0.1809
Outlet-HMP-1	1.30	0.1825
Outlet-HMP-1	1.32	0.1840
Outlet-HMP-1	1.33	0.1850
Outlet-HMP-1	1.34	0.1855
Outlet-HMP-1	1.36	0.1870
Outlet-HMP-1	1.38	0.1885
Outlet-HMP-1	1.40	0.1900
Outlet-HMP-1	1.42	0.1914
Outlet-HMP-1	1.44	0.1929
Outlet-HMP-1	1.46	0.1943
Outlet-HMP-1	1.48	0.1957
Outlet-HMP-1	1.50	0.1972
Outlet-HMP-1	1.52	0.1986
Outlet-HMP-1	1.54	0.2000
Outlet-HMP-1	1.56	0.2013

Outlet-HMP-1	1.58	0.2027
Outlet-HMP-1	1.60	0.2041
Outlet-HMP-1	1.62	0.2054
Outlet-HMP-1	1.64	0.2068
Outlet-HMP-1	1.66	0.2081
Outlet-HMP-1	1.67	0.2086
Outlet-HMP-1	1.68	0.2095
Outlet-HMP-1	1.70	0.2108
Outlet-HMP-1	1.72	0.2121
Outlet-HMP-1	1.74	0.2134
Outlet-HMP-1	1.76	0.2147
Outlet-HMP-1	1.78	0.2160
Outlet-HMP-1	1.80	0.2173
Outlet-HMP-1	1.82	0.2186
Outlet-HMP-1	1.83	0.2194
Outlet-HMP-1	1.84	0.2199
Outlet-HMP-1	1.86	0.2211
Outlet-HMP-1	1.88	0.2224
Outlet-HMP-1	1.90	0.2236
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Outlet-HMP-1	1.94	0.2261
Outlet-HMP-1	1.96	0.2273
Outlet-HMP-1	1.98	0.2285
Outlet-HMP-1	2.00	0.2298
Outlet-HMP-1	2.02	0.2310
Outlet-HMP-1	2.04	0.2322
Outlet-HMP-1	2.06	0.2334
Outlet-HMP-1	2.08	0.2346
Outlet-HMP-1	2.10	0.2357
Outlet-HMP-1	2.12	0.2369
Outlet-HMP-1	2.14	0.2381
Outlet-HMP-1	2.16	0.2393
Outlet-HMP-1	2.17	0.2396
Outlet-HMP-1	2.18	0.2404
Outlet-HMP-1	2.20	0.2416
Outlet-HMP-1	2.22	0.2427
Outlet-HMP-1	2.24	0.2439
Outlet-HMP-1	2.26	0.2450
Outlet-HMP-1	2.28	0.2461
Outlet-HMP-1	2.30	0.2473
Outlet-HMP-1	2.32	0.2484
Outlet-HMP-1	2.33	0.2491
Outlet-HMP-1	2.34	0.2495
Outlet-HMP-1	2.36	0.2506
Outlet-HMP-1	2.38	0.2517
Outlet-HMP-1	2.40	0.2528
Outlet-HMP-1	2.42	0.2539
Outlet-HMP-1	2.44	0.2550
Outlet-HMP-1	2.46	0.2561

Outlet-HMP-1	2.48	0.2572
Outlet-HMP-1	2.50	0.2583
Outlet-HMP-1	2.52	0.2594
Outlet-HMP-1	2.54	0.2604
Outlet-HMP-1	2.56	0.2615
Outlet-HMP-1	2.58	0.2626
Outlet-HMP-1	2.60	0.2636
Outlet-HMP-1	2.62	0.2647
Outlet-HMP-1	2.64	0.2657
Outlet-HMP-1	2.66	0.2668
Outlet-HMP-1	2.67	0.2671
Outlet-HMP-1	2.68	0.2678
Outlet-HMP-1	2.70	0.2689
Outlet-HMP-1	2.72	0.2699
Outlet-HMP-1	2.74	0.2709
Outlet-HMP-1	2.76	0.2719
Outlet-HMP-1	2.78	0.2730
Outlet-HMP-1	2.80	0.2740
Outlet-HMP-1	2.82	0.2750
Outlet-HMP-1	2.83	0.2757
Outlet-HMP-1	2.84	0.2760
Outlet-HMP-1	2.86	0.2770
Outlet-HMP-1	2.88	0.2780
Outlet-HMP-1	2.90	0.2790
Outlet-HMP-1	2.92	0.2800
Outlet-HMP-1	2.94	0.2810
Outlet-HMP-1	2.96	0.2820
Outlet-HMP-1	2.98	0.2830
Outlet-HMP-1	3.00	0.2840
Outlet-HMP-1	3.02	0.2849
Outlet-HMP-1	3.04	0.2859
Outlet-HMP-1	3.06	0.2869
Outlet-HMP-1	3.08	0.2879
Outlet-HMP-1	3.10	0.2888
Outlet-HMP-1	3.12	0.2898
Outlet-HMP-1	3.14	0.2907
Outlet-HMP-1	3.16	0.2917
Outlet-HMP-1	3.17	0.2920
Outlet-HMP-1	3.18	0.2927
Outlet-HMP-1	3.20	0.2936
Outlet-HMP-1	3.22	0.2946
Outlet-HMP-1	3.24	0.2955
Outlet-HMP-1	3.26	0.2964
Outlet-HMP-1	3.28	0.2974
Outlet-HMP-1	3.30	0.2983
Outlet-HMP-1	3.32	0.2992
Outlet-HMP-1	3.33	0.2999
Outlet-HMP-1	3.34	0.3002
Outlet-HMP-1	3.36	0.3011

Outlet-HMP-1	3.38	0.3020
Outlet-HMP-1	3.40	0.3029
Outlet-HMP-1	3.42	0.3039
Outlet-HMP-1	3.44	0.3048
Outlet-HMP-1	3.46	0.3057
Outlet-HMP-1	3.48	0.3066
Outlet-HMP-1	3.50	0.3075
Outlet-HMP-1	3.52	0.3084
Outlet-HMP-1	3.54	0.3093
Outlet-HMP-1	3.56	0.3102
Outlet-HMP-1	3.58	0.3111
Outlet-HMP-1	3.60	0.3120
Outlet-HMP-1	3.62	0.3129
Outlet-HMP-1	3.64	0.3138
Outlet-HMP-1	3.66	0.3147
Outlet-HMP-1	3.67	0.3150
Outlet-HMP-1	3.68	0.3156
Outlet-HMP-1	3.70	0.3164
Outlet-HMP-1	3.72	0.3173
Outlet-HMP-1	3.74	0.3182
Outlet-HMP-1	3.76	0.3191
Outlet-HMP-1	3.78	0.3199
Outlet-HMP-1	3.80	0.3208
Outlet-HMP-1	3.82	0.3217
Outlet-HMP-1	3.83	0.3222
Outlet-HMP-1	3.84	0.3225
Outlet-HMP-1	3.86	0.3234
Outlet-HMP-1	3.88	0.3243
Outlet-HMP-1	3.90	0.3251
Outlet-HMP-1	3.92	0.3304
Outlet-HMP-1	3.94	0.3438
Outlet-HMP-1	3.96	0.3650
Outlet-HMP-1	3.98	0.3932
Outlet-HMP-1	4.00	0.4279
Outlet-HMP-1	4.02	0.4682
Outlet-HMP-1	4.04	0.5135
Outlet-HMP-1	4.06	0.5629
Outlet-HMP-1	4.08	0.6155
Outlet-HMP-1	4.10	0.6706
Outlet-HMP-1	4.12	0.7273
Outlet-HMP-1	4.14	0.7657
Outlet-HMP-1	4.16	0.7972
Outlet-HMP-1	4.17	0.8072
Outlet-HMP-1	4.18	0.8267
Outlet-HMP-1	4.20	0.8546
Outlet-HMP-1	4.22	0.8843
Outlet-HMP-1	4.24	0.9188
Outlet-HMP-1	4.26	0.9576
Outlet-HMP-1	4.28	1.0007

Outlet-HMP-1	4.30	1.0475
Outlet-HMP-1	4.32	1.0977
Outlet-HMP-1	4.33	1.1327
Outlet-HMP-1	4.34	1.1507
Outlet-HMP-1	4.36	1.2060
Outlet-HMP-1	4.38	1.2632
Outlet-HMP-1	4.40	1.3215
Outlet-HMP-1	4.42	1.3806
Outlet-HMP-1	4.44	1.4261
Outlet-HMP-1	4.46	1.4663
Outlet-HMP-1	4.48	1.5047
Outlet-HMP-1	4.50	1.5416
Outlet-HMP-1	4.52	1.5772
Outlet-HMP-1	4.54	1.6117
Outlet-HMP-1	4.56	1.6451
Outlet-HMP-1	4.58	1.6776
Outlet-HMP-1	4.60	1.7093
Outlet-HMP-1	4.62	1.7402
Outlet-HMP-1	4.64	1.7703
Outlet-HMP-1	4.66	1.7998
Outlet-HMP-1	4.67	1.8095
Outlet-HMP-1	4.68	1.8287
Outlet-HMP-1	4.70	1.8571
Outlet-HMP-1	4.72	1.8848
Outlet-HMP-1	4.74	1.9121
Outlet-HMP-1	4.76	1.9389
Outlet-HMP-1	4.78	1.9653
Outlet-HMP-1	4.80	1.9912
Outlet-HMP-1	4.82	2.0167
Outlet-HMP-1	4.83	2.0335
Outlet-HMP-1	4.84	2.0418
Outlet-HMP-1	4.86	2.0666
Outlet-HMP-1	4.88	2.0910
Outlet-HMP-1	4.90	2.1151
Outlet-HMP-1	4.92	2.1388
Outlet-HMP-1	4.94	2.1623
Outlet-HMP-1	4.96	2.1854
Outlet-HMP-1	4.98	2.2083
Outlet-HMP-1	5.00	2.2309
Outlet-HMP-1	5.02	2.2532
Outlet-HMP-1	5.04	2.2753
Outlet-HMP-1	5.06	2.2971
Outlet-HMP-1	5.08	2.3187
Outlet-HMP-1	5.10	2.3401
Outlet-HMP-1	5.12	2.3612
Outlet-HMP-1	5.14	2.3822
Outlet-HMP-1	5.16	2.4029
Outlet-HMP-1	5.17	2.4098
Outlet-HMP-1	5.18	2.4234

Outlet-HMP-1	5.20	2.4438
Outlet-HMP-1	5.22	2.4639
Outlet-HMP-1	5.24	2.4839
Outlet-HMP-1	5.26	2.5036
Outlet-HMP-1	5.28	2.5232
Outlet-HMP-1	5.30	2.5427
Outlet-HMP-1	5.32	2.5620
Outlet-HMP-1	5.33	2.5747
Outlet-HMP-1	5.34	2.5811
Outlet-HMP-1	5.36	2.6000
Outlet-HMP-1	5.38	2.6188
Outlet-HMP-1	5.40	2.6375
Outlet-HMP-1	5.42	2.6560
Outlet-HMP-1	5.44	2.6744
Outlet-HMP-1	5.46	2.6926
Outlet-HMP-1	5.48	2.7107
Outlet-HMP-1	5.50	2.7287
Outlet-HMP-1	5.52	2.7465
Outlet-HMP-1	5.54	2.7642
Outlet-HMP-1	5.56	2.7818
Outlet-HMP-1	5.58	2.7992
Outlet-HMP-1	5.60	2.8166
Outlet-HMP-1	5.62	2.8338
Outlet-HMP-1	5.64	2.8509
Outlet-HMP-1	5.66	2.8679
Outlet-HMP-1	5.67	2.8736
Outlet-HMP-1	5.68	2.8848
Outlet-HMP-1	5.70	2.9016
Outlet-HMP-1	5.72	2.9183
Outlet-HMP-1	5.74	2.9349
Outlet-HMP-1	5.76	2.9514
Outlet-HMP-1	5.78	2.9678
Outlet-HMP-1	5.80	2.9841
Outlet-HMP-1	5.82	3.0002
Outlet-HMP-1	5.83	3.0110
Outlet-HMP-1	5.84	3.0163
Outlet-HMP-1	5.86	3.0323
Outlet-HMP-1	5.88	3.0483
Outlet-HMP-1	5.90	3.0641
Outlet-HMP-1	5.92	3.0798
Outlet-HMP-1	5.94	3.0955
Outlet-HMP-1	5.96	3.1110
Outlet-HMP-1	5.98	3.1265
Outlet-HMP-1	6.00	3.1419
Outlet-HMP-1	6.02	3.1710
Outlet-HMP-1	6.04	3.2115
Outlet-HMP-1	6.06	3.2592
Outlet-HMP-1	6.08	3.3129
Outlet-HMP-1	6.10	3.3717

Outlet-HMP-1	6.12	3.4764
Outlet-HMP-1	6.14	3.6195
Outlet-HMP-1	6.16	3.7887
Outlet-HMP-1	6.17	3.8816
Outlet-HMP-1	6.18	3.9795
Outlet-HMP-1	6.20	4.1892
Outlet-HMP-1	6.22	4.4161
Outlet-HMP-1	6.24	4.6586
Outlet-HMP-1	6.26	4.9158
Outlet-HMP-1	6.28	5.1867
Outlet-HMP-1	6.30	5.4707
Outlet-HMP-1	6.32	5.7671
Outlet-HMP-1	6.33	5.9198
Outlet-HMP-1	6.34	6.0754
Outlet-HMP-1	6.36	6.3951
Outlet-HMP-1	6.38	6.7257
Outlet-HMP-1	6.40	7.0669
Outlet-HMP-1	6.42	7.4184
Outlet-HMP-1	6.44	7.7798
Outlet-HMP-1	6.46	8.1509
Outlet-HMP-1	6.48	8.5314
Outlet-HMP-1	6.50	8.9211
Outlet-HMP-1	6.52	9.2587
Outlet-HMP-1	6.54	9.5933
Outlet-HMP-1	6.56	9.9338
Outlet-HMP-1	6.58	10.2802
Outlet-HMP-1	6.60	10.6323
Outlet-HMP-1	6.62	10.8071
Outlet-HMP-1	6.64	10.9522
Outlet-HMP-1	6.66	11.0948
Outlet-HMP-1	6.67	11.1653
Outlet-HMP-1	6.68	11.2352
Outlet-HMP-1	6.70	11.3735
Outlet-HMP-1	6.72	11.5097
Outlet-HMP-1	6.74	11.6439
Outlet-HMP-1	6.76	11.7763
Outlet-HMP-1	6.78	11.9069
Outlet-HMP-1	6.80	12.0357
Outlet-HMP-1	6.82	12.1630
Outlet-HMP-1	6.83	12.2260
Outlet-HMP-1	6.84	12.2886
Outlet-HMP-1	6.86	12.4128
Outlet-HMP-1	6.88	12.5354
Outlet-HMP-1	6.90	12.6567
Outlet-HMP-1	6.92	12.7766
Outlet-HMP-1	6.94	12.8952
Outlet-HMP-1	6.96	13.0125
Outlet-HMP-1	6.98	13.1286
Outlet-HMP-1	7.00	13.2436

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Outlet-HMP-1               7.02       13.3573
Outlet-HMP-1               7.04       13.4700
Outlet-HMP-1               7.06       13.5816
Outlet-HMP-1               7.08       13.6921
Outlet-HMP-1               7.10       13.8016
Outlet-HMP-1               7.12       13.9102
Outlet-HMP-1               7.14       14.0178
Outlet-HMP-1               7.16       14.1244
Outlet-HMP-1               7.17       14.1774
Outlet-HMP-1               7.18       14.2301
Outlet-HMP-1               7.20       14.3350
Outlet-HMP-1               7.22       14.4390
Outlet-HMP-1               7.24       14.5421
Outlet-HMP-1               7.26       14.6445
Outlet-HMP-1               7.28       14.7460
Outlet-HMP-1               7.30       14.8468
Outlet-HMP-1               7.32       14.9468
Outlet-HMP-1               7.33       14.9965
Outlet-HMP-1               7.34       15.0460
Outlet-HMP-1               7.36       15.1445
Outlet-HMP-1               7.38       15.2424
Outlet-HMP-1               7.40       15.3395
Outlet-HMP-1               7.42       15.4359
Outlet-HMP-1               7.44       15.5317
Outlet-HMP-1               7.46       15.6269
Outlet-HMP-1               7.48       15.7214
Outlet-HMP-1               7.50       15.8152
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HMP-2            Rating    0.00       0.000
HMP-2                      0.05       0.001
HMP-2                      0.10       0.001
HMP-2                      0.15       0.001
HMP-2                      0.20       0.001
HMP-2                      0.25       0.002
HMP-2                      0.30       0.002
HMP-2                      0.35       0.002
HMP-2                      0.40       0.002
HMP-2                      0.45       0.002
HMP-2                      0.50       0.002
HMP-2                      0.55       0.013
HMP-2                      0.60       0.026
HMP-2                      0.65       0.034
HMP-2                      0.70       0.040
HMP-2                      0.75       0.078
HMP-2                      0.80       0.171
HMP-2                      0.85       0.302
HMP-2                      0.90       0.423
HMP-2                      0.95       0.497
HMP-2                      1.00       0.562
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HMP-2	1.05	0.620
HMP-2	1.10	0.672
HMP-2	1.15	0.721
HMP-2	1.20	0.767
HMP-2	1.25	0.810
HMP-2	1.30	0.850
HMP-2	1.35	0.889
HMP-2	1.40	0.926
HMP-2	1.45	0.962
HMP-2	1.50	0.997
HMP-2	1.55	1.030
HMP-2	1.60	1.062
HMP-2	1.65	1.094
HMP-2	1.70	1.124
HMP-2	1.75	1.154
HMP-2	1.80	1.183
HMP-2	1.85	1.211
HMP-2	1.90	1.238
HMP-2	1.95	1.265
HMP-2	2.00	1.292
HMP-2	2.05	1.532
HMP-2	2.10	1.948
HMP-2	2.15	2.480
HMP-2	2.20	3.104
HMP-2	2.25	3.809
HMP-2	2.30	4.585
HMP-2	2.35	5.427
HMP-2	2.40	6.328
HMP-2	2.45	7.287
HMP-2	2.50	8.298
HMP-2	2.55	9.360
HMP-2	2.60	10.470
HMP-2	2.65	11.626
HMP-2	2.70	12.827
HMP-2	2.75	14.070
HMP-2	2.80	15.354
HMP-2	2.85	16.678
HMP-2	2.90	18.041
HMP-2	2.95	19.441
HMP-2	3.00	20.878
HMP-2	3.05	22.351
HMP-2	3.10	23.858
HMP-2	3.15	25.400
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HMP-2	3.25	28.582
HMP-2	3.30	30.221
HMP-2	3.35	31.892
HMP-2	3.40	33.593
HMP-2	3.45	35.325

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HMP-2                    3.70       38.678
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HMP-2                    4.40       45.806
HMP-2                    4.45       46.273
HMP-2                    4.50       46.735
;
HMP-3Outlet      Rating     0.00       0.000
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HMP-3Outlet                 0.10       0.001
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HMP-3Outlet                 1.30       0.005
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HMP-3Outlet                1.80       0.008
HMP-3Outlet                1.85       0.008
HMP-3Outlet                1.90       0.009
HMP-3Outlet                1.95       0.009
HMP-3Outlet                2.00       0.009
HMP-3Outlet                2.05       0.010
HMP-3Outlet                2.10       0.011
HMP-3Outlet                2.15       0.012
HMP-3Outlet                2.20       0.013
HMP-3Outlet                2.25       0.013
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HMP-3Outlet                2.35       0.014
HMP-3Outlet                2.40       0.015
HMP-3Outlet                2.45       0.015
HMP-3Outlet                2.50       0.016
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HMP-3Outlet                3.35       15.021
HMP-3Outlet                3.40       16.364
HMP-3Outlet                3.45       17.745
HMP-3Outlet                3.50       19.163
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;Basin#2
Storage-HMP-1    Storage   0.00       1830
Storage-HMP-1              0.02       1830
Storage-HMP-1              0.04       1830
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Storage-HMP-1	0.06	1830
Storage-HMP-1	0.08	1830
Storage-HMP-1	0.10	1830
Storage-HMP-1	0.12	1830
Storage-HMP-1	0.14	1830
Storage-HMP-1	0.16	1830
Storage-HMP-1	0.17	1830
Storage-HMP-1	0.18	1917
Storage-HMP-1	0.20	2066
Storage-HMP-1	0.22	2188
Storage-HMP-1	0.24	2289
Storage-HMP-1	0.26	2375
Storage-HMP-1	0.28	2448
Storage-HMP-1	0.30	2512
Storage-HMP-1	0.32	2568
Storage-HMP-1	0.33	230
Storage-HMP-1	0.34	2634
Storage-HMP-1	0.36	2724
Storage-HMP-1	0.38	2804
Storage-HMP-1	0.40	2877
Storage-HMP-1	0.42	2943
Storage-HMP-1	0.44	3002
Storage-HMP-1	0.46	3057
Storage-HMP-1	0.48	3107
Storage-HMP-1	0.50	3153
Storage-HMP-1	0.52	3219
Storage-HMP-1	0.54	3281
Storage-HMP-1	0.56	3337
Storage-HMP-1	0.58	3391
Storage-HMP-1	0.60	3440
Storage-HMP-1	0.62	3486
Storage-HMP-1	0.64	3530
Storage-HMP-1	0.66	3570
Storage-HMP-1	0.67	3590
Storage-HMP-1	0.68	3621
Storage-HMP-1	0.70	3680
Storage-HMP-1	0.72	3735
Storage-HMP-1	0.74	3788
Storage-HMP-1	0.76	3837
Storage-HMP-1	0.78	3885
Storage-HMP-1	0.80	3930
Storage-HMP-1	0.82	3972
Storage-HMP-1	0.83	4000
Storage-HMP-1	0.84	4016
Storage-HMP-1	0.86	4064
Storage-HMP-1	0.88	4110
Storage-HMP-1	0.90	4153
Storage-HMP-1	0.92	4195
Storage-HMP-1	0.94	4235

Storage-HMP-1	0.96	4273
Storage-HMP-1	0.98	4310
Storage-HMP-1	1.00	4345
Storage-HMP-1	1.02	4388
Storage-HMP-1	1.04	4429
Storage-HMP-1	1.06	4468
Storage-HMP-1	1.08	4506
Storage-HMP-1	1.10	4543
Storage-HMP-1	1.12	4578
Storage-HMP-1	1.14	4612
Storage-HMP-1	1.16	4645
Storage-HMP-1	1.17	4655
Storage-HMP-1	1.18	4681
Storage-HMP-1	1.20	4718
Storage-HMP-1	1.22	4754
Storage-HMP-1	1.24	4788
Storage-HMP-1	1.26	4822
Storage-HMP-1	1.28	4855
Storage-HMP-1	1.30	4886
Storage-HMP-1	1.32	4917
Storage-HMP-1	1.33	4937
Storage-HMP-1	1.34	4948
Storage-HMP-1	1.36	4982
Storage-HMP-1	1.38	5015
Storage-HMP-1	1.40	5047
Storage-HMP-1	1.42	5078
Storage-HMP-1	1.44	5108
Storage-HMP-1	1.46	5137
Storage-HMP-1	1.48	5166
Storage-HMP-1	1.50	5194
Storage-HMP-1	1.52	5225
Storage-HMP-1	1.54	5255
Storage-HMP-1	1.56	5284
Storage-HMP-1	1.58	5313
Storage-HMP-1	1.60	5341
Storage-HMP-1	1.62	5369
Storage-HMP-1	1.64	5395
Storage-HMP-1	1.66	5421
Storage-HMP-1	1.67	5430
Storage-HMP-1	1.68	5449
Storage-HMP-1	1.70	5477
Storage-HMP-1	1.72	5504
Storage-HMP-1	1.74	5531
Storage-HMP-1	1.76	5557
Storage-HMP-1	1.78	5583
Storage-HMP-1	1.80	5608
Storage-HMP-1	1.82	5632
Storage-HMP-1	1.83	5648
Storage-HMP-1	1.84	5657

Storage-HMP-1	1.86	5683
Storage-HMP-1	1.88	5708
Storage-HMP-1	1.90	5733
Storage-HMP-1	1.92	5758
Storage-HMP-1	1.94	5782
Storage-HMP-1	1.96	5805
Storage-HMP-1	1.98	5828
Storage-HMP-1	2.00	5850
Storage-HMP-1	2.02	5874
Storage-HMP-1	2.04	5898
Storage-HMP-1	2.06	5921
Storage-HMP-1	2.08	5944
Storage-HMP-1	2.10	5966
Storage-HMP-1	2.12	5988
Storage-HMP-1	2.14	6010
Storage-HMP-1	2.16	6031
Storage-HMP-1	2.17	6038
Storage-HMP-1	2.18	6053
Storage-HMP-1	2.20	6075
Storage-HMP-1	2.22	6097
Storage-HMP-1	2.24	6118
Storage-HMP-1	2.26	6139
Storage-HMP-1	2.28	6159
Storage-HMP-1	2.30	6180
Storage-HMP-1	2.32	6199
Storage-HMP-1	2.33	6212
Storage-HMP-1	2.34	6219
Storage-HMP-1	2.36	6240
Storage-HMP-1	2.38	6260
Storage-HMP-1	2.40	6280
Storage-HMP-1	2.42	6300
Storage-HMP-1	2.44	6319
Storage-HMP-1	2.46	6338
Storage-HMP-1	2.48	6356
Storage-HMP-1	2.50	6375
Storage-HMP-1	2.52	6394
Storage-HMP-1	2.54	6413
Storage-HMP-1	2.56	6431
Storage-HMP-1	2.58	6450
Storage-HMP-1	2.60	6468
Storage-HMP-1	2.62	6485
Storage-HMP-1	2.64	6503
Storage-HMP-1	2.66	6520
Storage-HMP-1	2.67	6526
Storage-HMP-1	2.68	6538
Storage-HMP-1	2.70	6555
Storage-HMP-1	2.72	6573
Storage-HMP-1	2.74	6590
Storage-HMP-1	2.76	6607

Storage-HMP-1	2.78	6623
Storage-HMP-1	2.80	6640
Storage-HMP-1	2.82	6656
Storage-HMP-1	2.83	6666
Storage-HMP-1	2.84	6672
Storage-HMP-1	2.86	6688
Storage-HMP-1	2.88	6705
Storage-HMP-1	2.90	6720
Storage-HMP-1	2.92	6736
Storage-HMP-1	2.94	6752
Storage-HMP-1	2.96	6767
Storage-HMP-1	2.98	6782
Storage-HMP-1	3.00	6797
Storage-HMP-1	3.02	6812
Storage-HMP-1	3.04	6827
Storage-HMP-1	3.06	6842
Storage-HMP-1	3.08	6857
Storage-HMP-1	3.10	6871
Storage-HMP-1	3.12	6886
Storage-HMP-1	3.14	6900
Storage-HMP-1	3.16	6914
Storage-HMP-1	3.17	6918
Storage-HMP-1	3.18	6928
Storage-HMP-1	3.20	6942
Storage-HMP-1	3.22	6956
Storage-HMP-1	3.24	6969
Storage-HMP-1	3.26	6983
Storage-HMP-1	3.28	6996
Storage-HMP-1	3.30	7009
Storage-HMP-1	3.32	7022
Storage-HMP-1	3.33	7031
Storage-HMP-1	3.34	7035
Storage-HMP-1	3.36	7048
Storage-HMP-1	3.38	7061
Storage-HMP-1	3.40	7074
Storage-HMP-1	3.42	7086
Storage-HMP-1	3.44	7098
Storage-HMP-1	3.46	7111
Storage-HMP-1	3.48	7123
Storage-HMP-1	3.50	7135
Storage-HMP-1	3.52	7147
Storage-HMP-1	3.54	7158
Storage-HMP-1	3.56	7170
Storage-HMP-1	3.58	7182
Storage-HMP-1	3.60	7193
Storage-HMP-1	3.62	7204
Storage-HMP-1	3.64	7216
Storage-HMP-1	3.66	7227
Storage-HMP-1	3.67	7230

Storage-HMP-1	3.68	7238
Storage-HMP-1	3.70	7249
Storage-HMP-1	3.72	7259
Storage-HMP-1	3.74	7270
Storage-HMP-1	3.76	7280
Storage-HMP-1	3.78	7291
Storage-HMP-1	3.80	7301
Storage-HMP-1	3.82	7311
Storage-HMP-1	3.83	7318
Storage-HMP-1	3.84	7321
Storage-HMP-1	3.86	7331
Storage-HMP-1	3.88	7341
Storage-HMP-1	3.90	7351
Storage-HMP-1	3.92	7361
Storage-HMP-1	3.94	7370
Storage-HMP-1	3.96	7380
Storage-HMP-1	3.98	7389
Storage-HMP-1	4.00	7398
Storage-HMP-1	4.02	7407
Storage-HMP-1	4.04	7416
Storage-HMP-1	4.06	7425
Storage-HMP-1	4.08	7434
Storage-HMP-1	4.10	7442
Storage-HMP-1	4.12	7451
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Storage-HMP-1	4.16	7468
Storage-HMP-1	4.17	7471
Storage-HMP-1	4.18	7476
Storage-HMP-1	4.20	7484
Storage-HMP-1	4.22	7492
Storage-HMP-1	4.24	7500
Storage-HMP-1	4.26	7508
Storage-HMP-1	4.28	7516
Storage-HMP-1	4.30	7523
Storage-HMP-1	4.32	7531
Storage-HMP-1	4.33	7536
Storage-HMP-1	4.34	7538
Storage-HMP-1	4.36	7546
Storage-HMP-1	4.38	7553
Storage-HMP-1	4.40	7560
Storage-HMP-1	4.42	7567
Storage-HMP-1	4.44	7574
Storage-HMP-1	4.46	7580
Storage-HMP-1	4.48	7587
Storage-HMP-1	4.50	7594
Storage-HMP-1	4.52	7600
Storage-HMP-1	4.54	7606
Storage-HMP-1	4.56	7613
Storage-HMP-1	4.58	7619

Storage-HMP-1	4.60	7625
Storage-HMP-1	4.62	7631
Storage-HMP-1	4.64	7637
Storage-HMP-1	4.66	7643
Storage-HMP-1	4.67	7645
Storage-HMP-1	4.68	7648
Storage-HMP-1	4.70	7654
Storage-HMP-1	4.72	7659
Storage-HMP-1	4.74	7664
Storage-HMP-1	4.76	7670
Storage-HMP-1	4.78	7675
Storage-HMP-1	4.80	7680
Storage-HMP-1	4.82	7685
Storage-HMP-1	4.83	7689
Storage-HMP-1	4.84	7690
Storage-HMP-1	4.86	7695
Storage-HMP-1	4.88	7699
Storage-HMP-1	4.90	7704
Storage-HMP-1	4.92	7708
Storage-HMP-1	4.94	7712
Storage-HMP-1	4.96	7717
Storage-HMP-1	4.98	7721
Storage-HMP-1	5.00	7725
Storage-HMP-1	5.02	7729
Storage-HMP-1	5.04	7733
Storage-HMP-1	5.06	7736
Storage-HMP-1	5.08	7740
Storage-HMP-1	5.10	7743
Storage-HMP-1	5.12	7747
Storage-HMP-1	5.14	7751
Storage-HMP-1	5.16	7754
Storage-HMP-1	5.17	7755
Storage-HMP-1	5.18	7757
Storage-HMP-1	5.20	7760
Storage-HMP-1	5.22	7763
Storage-HMP-1	5.24	7765
Storage-HMP-1	5.26	7768
Storage-HMP-1	5.28	7771
Storage-HMP-1	5.30	7773
Storage-HMP-1	5.32	7776
Storage-HMP-1	5.33	7778
Storage-HMP-1	5.34	7778
Storage-HMP-1	5.36	7780
Storage-HMP-1	5.38	7782
Storage-HMP-1	5.40	7784
Storage-HMP-1	5.42	7786
Storage-HMP-1	5.44	7788
Storage-HMP-1	5.46	7790
Storage-HMP-1	5.48	7792

Storage-HMP-1	5.50	7793
Storage-HMP-1	5.52	7794
Storage-HMP-1	5.54	7795
Storage-HMP-1	5.56	7796
Storage-HMP-1	5.58	7797
Storage-HMP-1	5.60	7798
Storage-HMP-1	5.62	7799
Storage-HMP-1	5.64	7800
Storage-HMP-1	5.66	7801
Storage-HMP-1	5.67	7802
Storage-HMP-1	5.68	7802
Storage-HMP-1	5.70	7802
Storage-HMP-1	5.72	7802
Storage-HMP-1	5.74	7802
Storage-HMP-1	5.76	7802
Storage-HMP-1	5.78	7802
Storage-HMP-1	5.80	7802
Storage-HMP-1	5.82	7802
Storage-HMP-1	5.83	7802
Storage-HMP-1	5.84	7802
Storage-HMP-1	5.86	7801
Storage-HMP-1	5.88	7800
Storage-HMP-1	5.90	7800
Storage-HMP-1	5.92	7799
Storage-HMP-1	5.94	7798
Storage-HMP-1	5.96	7797
Storage-HMP-1	5.98	7796
Storage-HMP-1	6.00	7796
Storage-HMP-1	6.02	7793
Storage-HMP-1	6.04	7791
Storage-HMP-1	6.06	7789
Storage-HMP-1	6.08	7787
Storage-HMP-1	6.10	7784
Storage-HMP-1	6.12	7782
Storage-HMP-1	6.14	7780
Storage-HMP-1	6.16	7778
Storage-HMP-1	6.17	7777
Storage-HMP-1	6.18	7776
Storage-HMP-1	6.20	7774
Storage-HMP-1	6.22	7772
Storage-HMP-1	6.24	7770
Storage-HMP-1	6.26	7768
Storage-HMP-1	6.28	7766
Storage-HMP-1	6.30	7765
Storage-HMP-1	6.32	7763
Storage-HMP-1	6.33	7762
Storage-HMP-1	6.34	7760
Storage-HMP-1	6.36	7755
Storage-HMP-1	6.38	7751

Storage-HMP-1	6.40	7747
Storage-HMP-1	6.42	7743
Storage-HMP-1	6.44	7738
Storage-HMP-1	6.46	7734
Storage-HMP-1	6.48	7730
Storage-HMP-1	6.50	7726
Storage-HMP-1	6.52	7721
Storage-HMP-1	6.54	7715
Storage-HMP-1	6.56	7710
Storage-HMP-1	6.58	7704
Storage-HMP-1	6.60	7699
Storage-HMP-1	6.62	7694
Storage-HMP-1	6.64	7689
Storage-HMP-1	6.66	7683
Storage-HMP-1	6.67	7681
Storage-HMP-1	6.68	7678
Storage-HMP-1	6.70	7672
Storage-HMP-1	6.72	7667
Storage-HMP-1	6.74	7661
Storage-HMP-1	6.76	7656
Storage-HMP-1	6.78	7650
Storage-HMP-1	6.80	7645
Storage-HMP-1	6.82	7639
Storage-HMP-1	6.83	7637
Storage-HMP-1	6.84	7633
Storage-HMP-1	6.86	7625
Storage-HMP-1	6.88	7617
Storage-HMP-1	6.90	7609
Storage-HMP-1	6.92	7601
Storage-HMP-1	6.94	7593
Storage-HMP-1	6.96	7585
Storage-HMP-1	6.98	7577
Storage-HMP-1	7.00	7570
Storage-HMP-1	7.02	7560
Storage-HMP-1	7.04	7550
Storage-HMP-1	7.06	7541
Storage-HMP-1	7.08	7531
Storage-HMP-1	7.10	7522
Storage-HMP-1	7.12	7512
Storage-HMP-1	7.14	7503
Storage-HMP-1	7.16	7494
Storage-HMP-1	7.17	7489
Storage-HMP-1	7.18	7484
Storage-HMP-1	7.20	7472
Storage-HMP-1	7.22	7461
Storage-HMP-1	7.24	7450
Storage-HMP-1	7.26	7439
Storage-HMP-1	7.28	7428
Storage-HMP-1	7.30	7418

```
Storage-HMP-1               7.32       7407
Storage-HMP-1               7.33       7401
Storage-HMP-1               7.34       7394
Storage-HMP-1               7.36       7379
Storage-HMP-1               7.38       7364
Storage-HMP-1               7.40       7349
Storage-HMP-1               7.42       7334
Storage-HMP-1               7.44       7319
Storage-HMP-1               7.46       7304
Storage-HMP-1               7.48       7290
Storage-HMP-1               7.50       7275
;
Storage-BF-1-2   Storage     0.00       2200
Storage-BF-1-2              0.05       2200
Storage-BF-1-2              0.10       2200
Storage-BF-1-2              0.15       2200
Storage-BF-1-2              0.20       2200
Storage-BF-1-2              0.25       2200
Storage-BF-1-2              0.30       2200
Storage-BF-1-2              0.35       2200
Storage-BF-1-2              0.40       2200
Storage-BF-1-2              0.45       2200
Storage-BF-1-2              0.50       2200
Storage-BF-1-2              0.55       2200
Storage-BF-1-2              0.60       2200
Storage-BF-1-2              0.65       2200
Storage-BF-1-2              0.70       2200
Storage-BF-1-2              0.75       2200
Storage-BF-1-2              0.80       2200
Storage-BF-1-2              0.85       2200
Storage-BF-1-2              0.90       2200
Storage-BF-1-2              0.95       2200
Storage-BF-1-2              1.00       2200
Storage-BF-1-2              1.05       2200
Storage-BF-1-2              1.10       2200
Storage-BF-1-2              1.15       2200
Storage-BF-1-2              1.20       2200
Storage-BF-1-2              1.25       2200
Storage-BF-1-2              1.30       2200
Storage-BF-1-2              1.35       2200
Storage-BF-1-2              1.40       2200
Storage-BF-1-2              1.45       2200
Storage-BF-1-2              1.50       2200
Storage-BF-1-2              1.55       2200
Storage-BF-1-2              1.60       2200
Storage-BF-1-2              1.65       2200
Storage-BF-1-2              1.70       2200
Storage-BF-1-2              1.75       2200
Storage-BF-1-2              1.80       2200
```

Storage-BF-1-2	1.85	2200
Storage-BF-1-2	1.90	2200
Storage-BF-1-2	1.95	2200
Storage-BF-1-2	2.00	2200
Storage-BF-1-2	2.05	2200
Storage-BF-1-2	2.10	2200
Storage-BF-1-2	2.15	2200
Storage-BF-1-2	2.20	2200
Storage-BF-1-2	2.25	2200
Storage-BF-1-2	2.30	2200
Storage-BF-1-2	2.35	2200
Storage-BF-1-2	2.40	2200
Storage-BF-1-2	2.45	2200
Storage-BF-1-2	2.50	2200
Storage-BF-1-2	2.55	2200
Storage-BF-1-2	2.60	2200
Storage-BF-1-2	2.65	2200
Storage-BF-1-2	2.70	2200
Storage-BF-1-2	2.75	2200
Storage-BF-1-2	2.80	2200
Storage-BF-1-2	2.85	2200
Storage-BF-1-2	2.90	2200
Storage-BF-1-2	2.95	2200
Storage-BF-1-2	3.00	2200
Storage-BF-1-2	3.05	2200
Storage-BF-1-2	3.10	2200
Storage-BF-1-2	3.15	2200
Storage-BF-1-2	3.20	2200
Storage-BF-1-2	3.25	2200
Storage-BF-1-2	3.30	2200
Storage-BF-1-2	3.35	2200
Storage-BF-1-2	3.40	2200
Storage-BF-1-2	3.45	2200
Storage-BF-1-2	3.50	2200
Storage-BF-1-2	3.55	2200
Storage-BF-1-2	3.60	2200
Storage-BF-1-2	3.65	2200
Storage-BF-1-2	3.70	2200
Storage-BF-1-2	3.75	2200
Storage-BF-1-2	3.80	2200
Storage-BF-1-2	3.85	2200
Storage-BF-1-2	3.90	2200
Storage-BF-1-2	3.95	2200
Storage-BF-1-2	4.00	2200
Storage-BF-1-2	4.05	2200
Storage-BF-1-2	4.10	2200
Storage-BF-1-2	4.15	2200
Storage-BF-1-2	4.20	2200
Storage-BF-1-2	4.25	2200

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Storage-BF-1-2              4.30       2200
Storage-BF-1-2              4.35       2200
Storage-BF-1-2              4.40       2200
Storage-BF-1-2              4.45       2200
Storage-BF-1-2              4.50       2200
;
HMP-3            Storage    0.00       510
HMP-3                       0.05       510
HMP-3                       0.10       510
HMP-3                       0.15       510
HMP-3                       0.20       510
HMP-3                       0.25       510
HMP-3                       0.30       510
HMP-3                       0.35       510
HMP-3                       0.40       510
HMP-3                       0.45       510
HMP-3                       0.50       510
HMP-3                       0.55       510
HMP-3                       0.60       510
HMP-3                       0.65       510
HMP-3                       0.70       510
HMP-3                       0.75       510
HMP-3                       0.80       510
HMP-3                       0.85       510
HMP-3                       0.90       510
HMP-3                       0.95       510
HMP-3                       1.00       510
HMP-3                       1.05       510
HMP-3                       1.10       510
HMP-3                       1.15       510
HMP-3                       1.20       510
HMP-3                       1.25       510
HMP-3                       1.30       510
HMP-3                       1.35       510
HMP-3                       1.40       510
HMP-3                       1.45       510
HMP-3                       1.50       510
HMP-3                       1.55       510
HMP-3                       1.60       510
HMP-3                       1.65       510
HMP-3                       1.70       510
HMP-3                       1.75       510
HMP-3                       1.80       510
HMP-3                       1.85       510
HMP-3                       1.90       510
HMP-3                       1.95       510
HMP-3                       2.00       510
HMP-3                       2.05       510
HMP-3                       2.10       510
```

```
HMP-3                    2.15       510
HMP-3                    2.20       510
HMP-3                    2.25       510
HMP-3                    2.30       510
HMP-3                    2.35       510
HMP-3                    2.40       510
HMP-3                    2.45       510
HMP-3                    2.50       510
HMP-3                    2.55       510
HMP-3                    2.60       510
HMP-3                    2.65       510
HMP-3                    2.70       510
HMP-3                    2.75       510
HMP-3                    2.80       510
HMP-3                    2.85       510
HMP-3                    2.90       510
HMP-3                    2.95       510
HMP-3                    3.00       510
HMP-3                    3.05       510
HMP-3                    3.10       510
HMP-3                    3.15       510
HMP-3                    3.20       510
HMP-3                    3.25       510
HMP-3                    3.30       510
HMP-3                    3.35       510
HMP-3                    3.40       510
HMP-3                    3.45       510
HMP-3                    3.50       510

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Lindbergh
Lindbergh        FILE "LbergRain.dat"

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 370.141 4295.274 847.527 4772.674
Units      None
```

```
[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
POC-1            601.439            4324.855
Vault-HMP1       403.883            4335.057

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------

[Polygons]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
DMA-4            733.648            4516.733
DMA-1            391.159            4730.623
DMA-3            782.529            4454.407
DMA-3            782.529            4453.367

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
Lindbergh        545.389            4726.910
```

HMP-1 Discharge

Discharge vs Elevation Table

Low orifice:	2.5 "	Top orifice:	2.5 "		
Number:	1	Number:	5		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.00 ft	invert elev:	4.20 ft		
Middle orifice:	2.5 "	Emergency inlet1:		Emergency inlet2:	
number of orif:	7	Invert:	6.00 ft	Invert:	6.10 ft
Cg-middle:	0.61	Diameter	0.5 ft	Diameter	1.5 ft
invert elev:	3.90 ft	Circumferenc	1.570796 ft	Circumferenc	4.712388 ft

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)	Qemerg (cfs)	Qtot (cfs)
0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000
0.02	0.10	0.00	0.00	0.00	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.0006
0.04	0.19	0.00	0.00	0.00	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.0024
0.06	0.29	0.00	0.00	0.00	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.0053
0.08	0.38	0.00	0.00	0.00	0.000	0.009	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.0092
0.10	0.48	0.00	0.00	0.00	0.000	0.014	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.0141
0.12	0.58	0.00	0.00	0.00	0.021	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.0197
0.14	0.67	0.00	0.00	0.00	0.032	0.026	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.0261
0.16	0.77	0.00	0.00	0.00	0.039	0.033	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.000	0.0330
0.17	0.82	0.00	0.00	0.00	0.043	0.037	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.000	0.0366
0.18	0.86	0.00	0.00	0.00	0.046	0.040	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.0404
0.20	0.96	0.00	0.00	0.00	0.052	0.048	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.000	0.0482
0.22	1.06	0.00	0.00	0.00	0.057	0.056	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.000	0.0561
0.24	1.15	0.00	0.00	0.00	0.062	0.064	0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.062	0.000	0.0615
0.26	1.25	0.00	0.00	0.00	0.066	0.072	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.066	0.000	0.0659
0.28	1.34	0.00	0.00	0.00	0.070	0.080	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.070	0.000	0.0700
0.30	1.44	0.00	0.00	0.00	0.074	0.088	0.074	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074	0.000	0.0738
0.32	1.54	0.00	0.00	0.00	0.078	0.095	0.078	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.078	0.000	0.0775
0.33	1.60	0.00	0.00	0.00	0.080	0.100	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.000	0.0799
0.34	1.63	0.00	0.00	0.00	0.081	0.102	0.081	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.0810
0.36	1.73	0.00	0.00	0.00	0.084	0.109	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.084	0.000	0.0844
0.38	1.82	0.00	0.00	0.00	0.088	0.115	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.088	0.000	0.0876
0.40	1.92	0.00	0.00	0.00	0.091	0.120	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.091	0.000	0.0908
0.42	2.02	0.00	0.00	0.00	0.094	0.125	0.094	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.094	0.000	0.0938
0.44	2.11	0.00	0.00	0.00	0.097	0.129	0.097	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.097	0.000	0.0967
0.46	2.21	0.00	0.00	0.00	0.100	0.132	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.000	0.0995
0.48	2.30	0.00	0.00	0.00	0.102	0.134	0.102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.102	0.000	0.1023
0.50	2.40	0.00	0.00	0.00	0.105	0.136	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.105	0.000	0.1050
0.52	2.50	0.00	0.00	0.00	0.108	0.138	0.108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.108	0.000	0.1076
0.54	2.59	0.00	0.00	0.00	0.110	0.139	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110	0.000	0.1102
0.56	2.69	0.00	0.00	0.00	0.113	0.139	0.113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.113	0.000	0.1127
0.58	2.78	0.00	0.00	0.00	0.115	0.139	0.115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115	0.000	0.1151
0.60	2.88	0.00	0.00	0.00	0.118	0.139	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.118	0.000	0.1175
0.62	2.98	0.00	0.00	0.00	0.120	0.140	0.120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120	0.000	0.1198
0.64	3.07	0.00	0.00	0.00	0.122	0.140	0.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.122	0.000	0.1222
0.66	3.17	0.00	0.00	0.00	0.124	0.142	0.124	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.124	0.000	0.1244
0.67	3.22	0.00	0.00	0.00	0.126	0.143	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.126	0.000	0.1255
0.68	3.26	0.00	0.00	0.00	0.127	0.144	0.127	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.127	0.000	0.1266
0.70	3.36	0.00	0.00	0.00	0.129	0.147	0.129	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.129	0.000	0.1288
0.72	3.46	0.00	0.00	0.00	0.131	0.152	0.131	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.131	0.000	0.1310
0.74	3.55	0.00	0.00	0.00	0.133	0.159	0.133	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.133	0.000	0.1331
0.76	3.65	0.00	0.00	0.00	0.135	0.169	0.135	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.135	0.000	0.1351
0.78	3.74	0.00	0.00	0.00	0.137	0.181	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.137	0.000	0.1372
0.80	3.84	0.00	0.00	0.00	0.139	0.198	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.139	0.000	0.1392
0.82	3.94	0.00	0.00	0.00	0.141	0.218	0.141	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.141	0.000	0.1412
0.83	4.00	0.00	0.00	0.00	0.142	0.234	0.142	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.142	0.000	0.1425
0.84	4.03	0.00	0.00	0.00	0.143	0.243	0.143	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.143	0.000	0.1431
0.86	4.13	0.00	0.00	0.00	0.145	0.273	0.145	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.145	0.000	0.1451

0.88	4.22	0.00	0.00	0.00	0.147	0.310	0.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147	0.000	0.1470
0.90	4.32	0.00	0.00	0.00	0.149	0.354	0.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.149	0.000	0.1489
0.92	4.42	0.00	0.00	0.00	0.151	0.405	0.151	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.151	0.000	0.1507
0.94	4.51	0.00	0.00	0.14	0.153	0.465	0.153	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.153	0.000	0.1526
0.96	4.61	0.00	0.00	1.30	0.154	0.535	0.154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.154	0.000	0.1544
0.98	4.70	0.00	0.00	2.45	0.156	0.616	0.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.156	0.000	0.1562
1.00	4.80	0.00	0.00	3.60	0.158	0.708	0.158	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.158	0.000	0.1579
1.02	4.90	0.00	0.00	4.75	0.160	0.813	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.160	0.000	0.1597
1.04	4.99	0.00	0.00	5.90	0.161	0.932	0.161	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.161	0.000	0.1614
1.06	5.09	0.00	0.00	7.06	0.163	1.067	0.163	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.163	0.000	0.1631
1.08	5.18	0.00	0.00	8.21	0.165	1.219	0.165	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.165	0.000	0.1648
1.10	5.28	0.00	0.00	9.36	0.167	1.388	0.167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.167	0.000	0.1665
1.12	5.38	0.00	0.00	10.51	0.168	1.577	0.168	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.168	0.000	0.1682
1.14	5.47	0.00	0.00	11.66	0.170	1.787	0.170	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.170	0.000	0.1698
1.16	5.57	0.00	0.00	12.82	0.171	2.020	0.171	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.171	0.000	0.1715
1.17	5.60	0.00	0.00	13.20	0.172	2.103	0.172	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.172	0.000	0.1720
1.18	5.66	0.00	0.00	13.97	0.173	2.278	0.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.173	0.000	0.1731
1.20	5.76	0.00	0.00	15.12	0.175	2.561	0.175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.000	0.1747
1.22	5.86	0.00	0.00	16.27	0.176	2.873	0.176	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.176	0.000	0.1763
1.24	5.95	0.00	0.00	17.42	0.178	3.214	0.178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.178	0.000	0.1778
1.26	6.05	0.00	0.00	18.58	0.179	3.588	0.179	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.179	0.000	0.1794
1.28	6.14	0.00	0.00	19.73	0.181	3.995	0.181	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.181	0.000	0.1809
1.30	6.24	0.00	0.00	20.88	0.182	4.439	0.182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.182	0.000	0.1825
1.32	6.34	0.00	0.00	22.03	0.184	4.921	0.184	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.184	0.000	0.1840
1.33	6.40	0.00	0.00	22.80	0.185	5.265	0.185	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.185	0.000	0.1850
1.34	6.43	0.00	0.00	23.18	0.186	5.444	0.186	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.186	0.000	0.1855
1.36	6.53	0.00	0.00	24.34	0.187	6.010	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187	0.000	0.1870
1.38	6.62	0.00	0.00	25.49	0.188	6.622	0.188	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.188	0.000	0.1885
1.40	6.72	0.00	0.00	26.64	0.190	7.282	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.190	0.000	0.1900
1.42	6.82	0.00	0.00	27.79	0.191	7.993	0.191	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.191	0.000	0.1914
1.44	6.91	0.00	0.00	28.94	0.193	8.758	0.193	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.193	0.000	0.1929
1.46	7.01	0.00	0.00	30.10	0.194	9.579	0.194	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.194	0.000	0.1943
1.48	7.10	0.00	0.00	31.25	0.196	10.461	0.196	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.196	0.000	0.1957
1.50	7.20	0.00	0.00	32.40	0.197	11.405	0.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.197	0.000	0.1972
1.52	7.30	0.00	0.00	33.55	0.199	12.415	0.199	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.199	0.000	0.1986
1.54	7.39	0.00	0.00	34.70	0.200	13.494	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.2000
1.56	7.49	0.00	0.00	35.86	0.201	14.646	0.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.201	0.000	0.2013
1.58	7.58	0.00	0.00	37.01	0.203	15.874	0.203	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.203	0.000	0.2027
1.60	7.68	0.00	0.00	38.16	0.204	17.181	0.204	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.204	0.000	0.2041
1.62	7.78	0.00	0.00	39.31	0.205	18.572	0.205	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.205	0.000	0.2054
1.64	7.87	0.00	0.00	40.46	0.207	20.051	0.207	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.207	0.000	0.2068
1.66	7.97	0.00	0.00	41.62	0.208	21.620	0.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.208	0.000	0.2081
1.67	8.00	0.00	0.00	42.00	0.209	22.164	0.209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.209	0.000	0.2086
1.68	8.06	0.00	0.00	42.77	0.209	23.285	0.209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.209	0.000	0.2095
1.70	8.16	0.00	0.00	43.92	0.211	25.049	0.211	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.211	0.000	0.2108
1.72	8.26	0.00	0.00	45.07	0.212	26.917	0.212	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.212	0.000	0.2121
1.74	8.35	0.00	0.00	46.22	0.213	28.893	0.213	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.213	0.000	0.2134
1.76	8.45	0.00	0.00	47.38	0.215	30.981	0.215	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.215	0.000	0.2147
1.78	8.54	0.00	0.00	48.53	0.216	33.187	0.216	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.216	0.000	0.2160
1.80	8.64	0.00	0.00	49.68	0.217	35.514	0.217	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.217	0.000	0.2173
1.82	8.74	0.00	0.00	50.83	0.219	37.969	0.219	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.219	0.000	0.2186
1.83	8.80	0.00	0.00	51.60	0.219	39.678	0.219	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.219	0.000	0.2194
1.84	8.83	0.00	0.00	51.98	0.220	40.555	0.220	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.220	0.000	0.2199
1.86	8.93	0.00	0.00	53.14	0.221	43.278	0.221	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.221	0.000	0.2211
1.88	9.02	0.00	0.00	54.29	0.222	46.144	0.222	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.222	0.000	0.2224
1.90	9.12	0.00	0.00	55.44	0.224	49.157	0.224	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.224	0.000	0.2236
1.92	9.22	0.00	0.00	56.59	0.225	52.323	0.225	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.000	0.2249
1.94	9.31	0.00	0.00	57.74	0.226	55.648	0.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.226	0.000	0.2261
1.96	9.41	0.00	0.00	58.90	0.227	59.138	0.227	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.227	0.000	0.2273
1.98	9.50	0.00	0.00	60.05	0.229	62.798	0.229	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.229	0.000	0.2285
2.00	9.60	0.00	0.00	61.20	0.230	66.635	0.230	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.230	0.000	0.2298
2.02	9.70	0.00	0.00	62.35	0.231	70.654	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.231	0.000	0.2310
2.04	9.79	0.00	0.00	63.50	0.232	74.863	0.232	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.232	0.000	0.2322
2.06	9.89	0.00	0.00	64.66	0.233	79.267	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.233	0.000	0.2334

2.08	9.98	0.00	0.00	65.81	0.235	83.873	0.235	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.235	0.000	0.2346
2.10	10.08	0.00	0.00	66.96	0.236	88.689	0.236	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.236	0.000	0.2357
2.12	10.18	0.00	0.00	68.11	0.237	93.720	0.237	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.237	0.000	0.2369
2.14	10.27	0.00	0.00	69.26	0.238	98.975	0.238	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.238	0.000	0.2381
2.16	10.37	0.00	0.00	70.42	0.239	104.459	0.239	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.239	0.000	0.2393
2.17	10.40	0.00	0.00	70.80	0.240	106.340	0.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.240	0.000	0.2396
2.18	10.46	0.00	0.00	71.57	0.240	110.182	0.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.240	0.000	0.2404
2.20	10.56	0.00	0.00	72.72	0.242	116.149	0.242	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.242	0.000	0.2416
2.22	10.66	0.00	0.00	73.87	0.243	122.369	0.243	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.243	0.000	0.2427
2.24	10.75	0.00	0.00	75.02	0.244	128.850	0.244	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.244	0.000	0.2439
2.26	10.85	0.00	0.00	76.18	0.245	135.600	0.245	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.245	0.000	0.2450
2.28	10.94	0.00	0.00	77.33	0.246	142.626	0.246	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.246	0.000	0.2461
2.30	11.04	0.00	0.00	78.48	0.247	149.937	0.247	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.247	0.000	0.2473
2.32	11.14	0.00	0.00	79.63	0.248	157.542	0.248	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.248	0.000	0.2484
2.33	11.20	0.00	0.00	80.40	0.249	162.779	0.249	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.249	0.000	0.2491
2.34	11.23	0.00	0.00	80.78	0.250	165.449	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.2495
2.36	11.33	0.00	0.00	81.94	0.251	173.668	0.251	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.251	0.000	0.2506
2.38	11.42	0.00	0.00	83.09	0.252	182.206	0.252	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.252	0.000	0.2517
2.40	11.52	0.00	0.00	84.24	0.253	191.073	0.253	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.253	0.000	0.2528
2.42	11.62	0.00	0.00	85.39	0.254	200.279	0.254	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.254	0.000	0.2539
2.44	11.71	0.00	0.00	86.54	0.255	209.833	0.255	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.255	0.000	0.2550
2.46	11.81	0.00	0.00	87.70	0.256	219.744	0.256	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.256	0.000	0.2561
2.48	11.90	0.00	0.00	88.85	0.257	230.023	0.257	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.257	0.000	0.2572
2.50	12.00	0.00	0.00	90.00	0.258	240.680	0.258	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.258	0.000	0.2583
2.52	12.10	0.00	0.00	91.15	0.259	251.724	0.259	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.259	0.000	0.2594
2.54	12.19	0.00	0.00	92.30	0.260	263.166	0.260	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.260	0.000	0.2604
2.56	12.29	0.00	0.00	93.46	0.262	275.017	0.262	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.262	0.000	0.2615
2.58	12.38	0.00	0.00	94.61	0.263	287.287	0.263	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.263	0.000	0.2626
2.60	12.48	0.00	0.00	95.76	0.264	299.987	0.264	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.264	0.000	0.2636
2.62	12.58	0.00	0.00	96.91	0.265	313.128	0.265	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.265	0.000	0.2647
2.64	12.67	0.00	0.00	98.06	0.266	326.722	0.266	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.266	0.000	0.2657
2.66	12.77	0.00	0.00	99.22	0.267	340.781	0.267	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.267	0.000	0.2668
2.67	12.80	0.00	0.00	99.60	0.267	345.572	0.267	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.267	0.000	0.2671
2.68	12.86	0.00	0.00	100.37	0.268	355.315	0.268	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.268	0.000	0.2678
2.70	12.96	0.00	0.00	101.52	0.269	370.337	0.269	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.269	0.000	0.2689
2.72	13.06	0.00	0.00	102.67	0.270	385.858	0.270	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.270	0.000	0.2699
2.74	13.15	0.00	0.00	103.82	0.271	401.891	0.271	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.271	0.000	0.2709
2.76	13.25	0.00	0.00	104.98	0.272	418.449	0.272	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.272	0.000	0.2719
2.78	13.34	0.00	0.00	106.13	0.273	435.544	0.273	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.273	0.000	0.2730
2.80	13.44	0.00	0.00	107.28	0.274	453.189	0.274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.274	0.000	0.2740
2.82	13.54	0.00	0.00	108.43	0.275	471.396	0.275	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.275	0.000	0.2750
2.83	13.60	0.00	0.00	109.20	0.276	483.854	0.276	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.276	0.000	0.2757
2.84	13.63	0.00	0.00	109.58	0.276	490.180	0.276	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.276	0.000	0.2760
2.86	13.73	0.00	0.00	110.74	0.277	509.553	0.277	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.277	0.000	0.2770
2.88	13.82	0.00	0.00	111.89	0.278	529.530	0.278	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.278	0.000	0.2780
2.90	13.92	0.00	0.00	113.04	0.279	550.124	0.279	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.279	0.000	0.2790
2.92	14.02	0.00	0.00	114.19	0.280	571.349	0.280	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.280	0.000	0.2800
2.94	14.11	0.00	0.00	115.34	0.281	593.220	0.281	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.281	0.000	0.2810
2.96	14.21	0.00	0.00	116.50	0.282	615.751	0.282	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.2820
2.98	14.30	0.00	0.00	117.65	0.283	638.957	0.283	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.283	0.000	0.2830
3.00	14.40	0.00	0.00	118.80	0.284	662.852	0.284	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.284	0.000	0.2840
3.02	14.50	0.00	0.00	119.95	0.285	687.452	0.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.285	0.000	0.2849
3.04	14.59	0.00	0.00	121.10	0.286	712.772	0.286	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.286	0.000	0.2859
3.06	14.69	0.00	0.00	122.26	0.287	738.828	0.287	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.287	0.000	0.2869
3.08	14.78	0.00	0.00	123.41	0.288	765.636	0.288	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.288	0.000	0.2879
3.10	14.88	0.00	0.00	124.56	0.289	793.211	0.289	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.289	0.000	0.2888
3.12	14.98	0.00	0.00	125.71	0.290	821.571	0.290	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.290	0.000	0.2898
3.14	15.07	0.00	0.00	126.86	0.291	850.730	0.291	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.291	0.000	0.2907
3.16	15.17	0.00	0.00	128.02	0.292	880.707	0.292	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.292	0.000	0.2917
3.17	15.20	0.00	0.00	128.40	0.292	890.883	0.292	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.292	0.000	0.2920
3.18	15.26	0.00	0.00	129.17	0.293	911.517	0.293	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.293	0.000	0.2927
3.20	15.36	0.00	0.00	130.32	0.294	943.179	0.294	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.294	0.000	0.2936
3.22	15.46	0.00	0.00	131.47	0.295	975.710	0.295	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.295	0.000	0.2946
3.24	15.55	0.00	0.00	132.62	0.295	1009.126	0.295	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.295	0.000	0.2955

3.26	15.65	0.00	0.00	133.78	0.296	1043.447	0.296	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.296	0.000	0.2964
3.28	15.74	0.00	0.00	134.93	0.297	1078.690	0.297	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.297	0.000	0.2974
3.30	15.84	0.00	0.00	136.08	0.298	1114.874	0.298	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.298	0.000	0.2983
3.32	15.94	0.00	0.00	137.23	0.299	1152.016	0.299	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.299	0.000	0.2992
3.33	16.00	0.00	0.00	138.00	0.300	1177.320	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300	0.000	0.2999
3.34	16.03	0.00	0.00	138.38	0.300	1190.137	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300	0.000	0.3002
3.36	16.13	0.00	0.00	139.54	0.301	1229.255	0.301	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.301	0.000	0.3011
3.38	16.22	0.00	0.00	140.69	0.302	1269.389	0.302	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.302	0.000	0.3020
3.40	16.32	0.00	0.00	141.84	0.303	1310.559	0.303	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.303	0.000	0.3029
3.42	16.42	0.00	0.00	142.99	0.304	1352.784	0.304	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	0.3039
3.44	16.51	0.00	0.00	144.14	0.305	1396.086	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.305	0.000	0.3048
3.46	16.61	0.00	0.00	145.30	0.306	1440.483	0.306	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.306	0.000	0.3057
3.48	16.70	0.00	0.00	146.45	0.307	1485.998	0.307	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.307	0.000	0.3066
3.50	16.80	0.00	0.00	147.60	0.308	1532.649	0.308	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.308	0.000	0.3075
3.52	16.90	0.00	0.00	148.75	0.308	1580.460	0.308	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.308	0.000	0.3084
3.54	16.99	0.00	0.00	149.90	0.309	1629.450	0.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.309	0.000	0.3093
3.56	17.09	0.00	0.00	151.06	0.310	1679.642	0.310	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.310	0.000	0.3102
3.58	17.18	0.00	0.00	152.21	0.311	1731.057	0.311	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.311	0.000	0.3111
3.60	17.28	0.00	0.00	153.36	0.312	1783.717	0.312	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.312	0.000	0.3120
3.62	17.38	0.00	0.00	154.51	0.313	1837.645	0.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.313	0.000	0.3129
3.64	17.47	0.00	0.00	155.66	0.314	1892.864	0.314	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.314	0.000	0.3138
3.66	17.57	0.00	0.00	156.82	0.315	1949.396	0.315	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.315	0.000	0.3147
3.67	17.60	0.00	0.00	157.20	0.315	1968.536	0.315	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.315	0.000	0.3150
3.68	17.66	0.00	0.00	157.97	0.316	2007.265	0.316	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.316	0.000	0.3156
3.70	17.76	0.00	0.00	159.12	0.316	2066.494	0.316	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.316	0.000	0.3164
3.72	17.86	0.00	0.00	160.27	0.317	2127.106	0.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	0.000	0.3173
3.74	17.95	0.00	0.00	161.42	0.318	2189.127	0.318	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.318	0.000	0.3182
3.76	18.05	0.00	0.00	162.58	0.319	2252.579	0.319	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.319	0.000	0.3191
3.78	18.14	0.00	0.00	163.73	0.320	2317.488	0.320	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.320	0.000	0.3199
3.80	18.24	0.00	0.00	164.88	0.321	2383.878	0.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.321	0.000	0.3208
3.82	18.34	0.00	0.00	166.03	0.322	2451.774	0.322	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.322	0.000	0.3217
3.83	18.40	0.00	0.00	166.80	0.322	2497.888	0.322	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.322	0.000	0.3222
3.84	18.43	0.00	0.00	167.18	0.323	2521.202	0.323	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.323	0.000	0.3225
3.86	18.53	0.00	0.00	168.34	0.323	2592.188	0.323	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.323	0.000	0.3234
3.88	18.62	0.00	0.00	169.49	0.324	2664.757	0.324	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.324	0.000	0.3243
3.90	18.72	0.00	0.00	170.64	0.325	2738.936	0.325	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.325	0.000	0.3251
3.92	18.82	0.10	0.00	171.79	0.326	2814.751	0.326	0.000	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.330	0.000	0.3304
3.94	18.91	0.19	0.00	172.94	0.327	2892.229	0.327	0.000	0.017	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.344	0.000	0.3438
3.96	19.01	0.29	0.00	174.10	0.328	2971.397	0.328	0.000	0.037	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.365	0.000	0.3650
3.98	19.10	0.38	0.00	175.25	0.329	3052.283	0.329	0.000	0.065	0.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.393	0.000	0.3932
4.00	19.20	0.48	0.00	176.40	0.329	3134.913	0.329	0.000	0.099	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.428	0.000	0.4279
4.02	19.30	0.58	0.00	177.55	0.330	3219.317	0.330	0.147	0.138	0.138	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.468	0.000	0.4682
4.04	19.39	0.67	0.00	178.70	0.331	3305.522	0.331	0.221	0.182	0.182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.513	0.000	0.5135
4.06	19.49	0.77	0.00	179.86	0.332	3393.557	0.332	0.276	0.231	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.563	0.000	0.5629
4.08	19.58	0.86	0.00	181.01	0.333	3483.450	0.333	0.322	0.283	0.283	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.616	0.000	0.6155
4.10	19.68	0.96	0.00	182.16	0.334	3575.232	0.334	0.362	0.337	0.337	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.671	0.000	0.6706
4.12	19.78	1.06	0.00	183.31	0.334	3668.931	0.334	0.398	0.393	0.393	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.727	0.000	0.7273
4.14	19.87	1.15	0.00	184.46	0.335	3764.578	0.335	0.431	0.450	0.431	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.766	0.000	0.7657
4.16	19.97	1.25	0.00	185.62	0.336	3862.201	0.336	0.461	0.506	0.461	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.797	0.000	0.7972
4.17	20.00	1.28	0.00	186.00	0.336	3895.187	0.336	0.471	0.525	0.471	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.807	0.000	0.8072
4.18	20.06	1.34	0.00	186.77	0.337	3961.833	0.337	0.490	0.562	0.490	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.827	0.000	0.8267
4.20	20.16	1.44	0.00	187.92	0.338	4063.502	0.338	0.517	0.616	0.517	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.855	0.000	0.8546
4.22	20.26	1.54	0.10	189.07	0.339	4167.241	0.339	0.543	0.668	0.543	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.884	0.000	0.8843
4.24	20.35	1.63	0.19	190.22	0.339	4273.081	0.339	0.567	0.716	0.567	0.000	0.012	0.012	0.000	0.000	0.000	0.000	0.919	0.000	0.9188
4.26	20.45	1.73	0.29	191.38	0.340	4381.053	0.340	0.591	0.762	0.591	0.000	0.027	0.027	0.000	0.000	0.000	0.000	0.958	0.000	0.9576
4.28	20.54	1.82	0.38	192.53	0.341	4491.189	0.341	0.613	0.803	0.613	0.000	0.046	0.046	0.000	0.000	0.000	0.000	1.001	0.000	1.0007
4.30	20.64	1.92	0.48	193.68	0.342	4603.522	0.342	0.635	0.840	0.635	0.000	0.070	0.070	0.000	0.000	0.000	0.000	1.048	0.000	1.0475
4.32	20.74	2.02	0.58	194.83	0.343	4718.083	0.343	0.656	0.872	0.656	0.105	0.099	0.099	0.000	0.000	0.000	0.000	1.098	0.000	1.0977
4.33	20.80	2.08	0.64	195.60	0.343	4795.713	0.343	0.670	0.891	0.670	0.142	0.119	0.119	0.000	0.000	0.000	0.000	1.133	0.000	1.1327
4.34	20.83	2.11	0.67	195.98	0.343	4834.907	0.343	0.677	0.900	0.677	0.158	0.130	0.130	0.000	0.000	0.000	0.000	1.151	0.000	1.1507
4.36	20.93	2.21	0.77	197.14	0.344	4954.026	0.344	0.697	0.923	0.697	0.197	0.165	0.165	0.000	0.000	0.000	0.000	1.206	0.000	1.2060
4.38	21.02	2.30	0.86	198.29	0.345	5075.474	0.345	0.716	0.941	0.716	0.230	0.202	0.202	0.000	0.000	0.000	0.000	1.263	0.000	1.2632
4.40	21.12	2.40	0.96	199.44	0.346	5199.284	0.346	0.735	0.954	0.735	0.258	0.241	0.241	0.000	0.000	0.000	0.000	1.322	0.000	1.3215
4.42	21.22	2.50	1.06	200.59	0.347	5325.491	0.347	0.753	0.964	0.753	0.284	0.281	0.281	0.000	0.000	0.000	0.000	1.381	0.000	1.3806

4.44	21.31	2.59	1.15	201.74	0.347	5454.130	0.347	0.771	0.970	0.771	0.308	0.321	0.308	0.000	0.000	0.000	0.000	1.426	0.000	1.4261
4.46	21.41	2.69	1.25	202.90	0.348	5585.234	0.348	0.789	0.973	0.789	0.329	0.361	0.329	0.000	0.000	0.000	0.000	1.466	0.000	1.4663
4.48	21.50	2.78	1.34	204.05	0.349	5718.840	0.349	0.806	0.975	0.806	0.350	0.401	0.350	0.000	0.000	0.000	0.000	1.505	0.000	1.5047
4.50	21.60	2.88	1.44	205.20	0.350	5854.983	0.350	0.823	0.976	0.823	0.369	0.440	0.369	0.000	0.000	0.000	0.000	1.542	0.000	1.5416
4.52	21.70	2.98	1.54	206.35	0.351	5993.698	0.351	0.839	0.978	0.839	0.388	0.477	0.388	0.000	0.000	0.000	0.000	1.577	0.000	1.5772
4.54	21.79	3.07	1.63	207.50	0.351	6135.022	0.351	0.855	0.983	0.855	0.405	0.512	0.405	0.000	0.000	0.000	0.000	1.612	0.000	1.6117
4.56	21.89	3.17	1.73	208.66	0.352	6278.992	0.352	0.871	0.991	0.871	0.422	0.544	0.422	0.000	0.000	0.000	0.000	1.645	0.000	1.6451
4.58	21.98	3.26	1.82	209.81	0.353	6425.643	0.353	0.886	1.006	0.886	0.438	0.574	0.438	0.000	0.000	0.000	0.000	1.678	0.000	1.6776
4.60	22.08	3.36	1.92	210.96	0.354	6575.014	0.354	0.902	1.030	0.902	0.454	0.600	0.454	0.000	0.000	0.000	0.000	1.709	0.000	1.7093
4.62	22.18	3.46	2.02	212.11	0.355	6727.143	0.355	0.917	1.066	0.917	0.469	0.623	0.469	0.000	0.000	0.000	0.000	1.740	0.000	1.7402
4.64	22.27	3.55	2.11	213.26	0.355	6882.065	0.355	0.931	1.115	0.931	0.484	0.643	0.484	0.000	0.000	0.000	0.000	1.770	0.000	1.7703
4.66	22.37	3.65	2.21	214.42	0.356	7039.821	0.356	0.946	1.182	0.946	0.498	0.659	0.498	0.000	0.000	0.000	0.000	1.800	0.000	1.7998
4.67	22.40	3.68	2.24	214.80	0.356	7093.043	0.356	0.951	1.209	0.951	0.502	0.664	0.502	0.000	0.000	0.000	0.000	1.810	0.000	1.8095
4.68	22.46	3.74	2.30	215.57	0.357	7200.449	0.357	0.960	1.270	0.960	0.512	0.672	0.512	0.000	0.000	0.000	0.000	1.829	0.000	1.8287
4.70	22.56	3.84	2.40	216.72	0.358	7363.986	0.358	0.974	1.383	0.974	0.525	0.682	0.525	0.000	0.000	0.000	0.000	1.857	0.000	1.8571
4.72	22.66	3.94	2.50	217.87	0.359	7530.474	0.359	0.988	1.525	0.988	0.538	0.688	0.538	0.000	0.000	0.000	0.000	1.885	0.000	1.8848
4.74	22.75	4.03	2.59	219.02	0.359	7699.951	0.359	1.002	1.700	1.002	0.551	0.693	0.551	0.000	0.000	0.000	0.000	1.912	0.000	1.9121
4.76	22.85	4.13	2.69	220.18	0.360	7872.457	0.360	1.016	1.913	1.016	0.563	0.695	0.563	0.000	0.000	0.000	0.000	1.939	0.000	1.9389
4.78	22.94	4.22	2.78	221.33	0.361	8048.033	0.361	1.029	2.169	1.029	0.576	0.696	0.576	0.000	0.000	0.000	0.000	1.965	0.000	1.9653
4.80	23.04	4.32	2.88	222.48	0.362	8226.720	0.362	1.042	2.475	1.042	0.588	0.697	0.588	0.000	0.000	0.000	0.000	1.991	0.000	1.9912
4.82	23.14	4.42	2.98	223.63	0.362	8408.557	0.362	1.055	2.835	1.055	0.599	0.699	0.599	0.000	0.000	0.000	0.000	2.017	0.000	2.0167
4.83	23.20	4.48	3.04	224.40	0.363	8531.553	0.363	1.064	3.108	1.064	0.607	0.700	0.607	0.000	0.000	0.000	0.000	2.033	0.000	2.0335
4.84	23.23	4.51	3.07	224.78	0.363	8593.587	0.363	1.068	3.256	1.068	0.611	0.702	0.611	0.000	0.000	0.000	0.000	2.042	0.000	2.0418
4.86	23.33	4.61	3.17	225.94	0.364	8781.852	0.364	1.081	3.745	1.081	0.622	0.708	0.622	0.000	0.000	0.000	0.000	2.067	0.000	2.0666
4.88	23.42	4.70	3.26	227.09	0.365	8973.393	0.365	1.093	4.309	1.093	0.633	0.719	0.633	0.000	0.000	0.000	0.000	2.091	0.000	2.0910
4.90	23.52	4.80	3.36	228.24	0.365	9168.254	0.365	1.106	4.955	1.106	0.644	0.736	0.644	0.000	0.000	0.000	0.000	2.115	0.000	2.1151
4.92	23.62	4.90	3.46	229.39	0.366	9366.476	0.366	1.118	5.692	1.118	0.655	0.761	0.655	0.000	0.000	0.000	0.000	2.139	0.000	2.1388
4.94	23.71	4.99	3.55	230.54	0.367	9568.103	0.367	1.130	6.527	1.130	0.665	0.797	0.665	0.000	0.000	0.000	0.000	2.162	0.000	2.1623
4.96	23.81	5.09	3.65	231.70	0.368	9773.179	0.368	1.142	7.470	1.142	0.676	0.844	0.676	0.000	0.000	0.000	0.000	2.185	0.000	2.1854
4.98	23.90	5.18	3.74	232.85	0.368	9981.747	0.368	1.154	8.530	1.154	0.686	0.907	0.686	0.000	0.000	0.000	0.000	2.208	0.000	2.2083
5.00	24.00	5.28	3.84	234.00	0.369	10193.852	0.369	1.166	9.717	1.166	0.696	0.988	0.696	0.000	0.000	0.000	0.000	2.231	0.000	2.2309
5.02	24.10	5.38	3.94	235.15	0.370	10409.539	0.370	1.177	11.041	1.177	0.706	1.089	0.706	0.000	0.000	0.000	0.000	2.253	0.000	2.2532
5.04	24.19	5.47	4.03	236.30	0.371	10628.852	0.371	1.189	12.512	1.189	0.716	1.214	0.716	0.000	0.000	0.000	0.000	2.275	0.000	2.2753
5.06	24.29	5.57	4.13	237.46	0.371	10851.838	0.371	1.200	14.143	1.200	0.725	1.366	0.725	0.000	0.000	0.000	0.000	2.297	0.000	2.2971
5.08	24.38	5.66	4.22	238.61	0.372	11078.541	0.372	1.212	15.945	1.212	0.735	1.549	0.735	0.000	0.000	0.000	0.000	2.319	0.000	2.3187
5.10	24.48	5.76	4.32	239.76	0.373	11309.008	0.373	1.223	17.929	1.223	0.744	1.768	0.744	0.000	0.000	0.000	0.000	2.340	0.000	2.3401
5.12	24.58	5.86	4.42	240.91	0.374	11543.286	0.374	1.234	20.111	1.234	0.754	2.025	0.754	0.000	0.000	0.000	0.000	2.361	0.000	2.3612
5.14	24.67	5.95	4.51	242.06	0.374	11781.421	0.374	1.245	22.501	1.245	0.763	2.326	0.763	0.000	0.000	0.000	0.000	2.382	0.000	2.3822
5.16	24.77	6.05	4.61	243.22	0.375	12023.461	0.375	1.256	25.115	1.256	0.772	2.675	0.772	0.000	0.000	0.000	0.000	2.403	0.000	2.4029
5.17	24.80	6.08	4.64	243.60	0.375	12105.017	0.375	1.259	26.039	1.259	0.775	2.803	0.775	0.000	0.000	0.000	0.000	2.410	0.000	2.4098
5.18	24.86	6.14	4.70	244.37	0.376	12269.454	0.376	1.267	27.968	1.267	0.781	3.078	0.781	0.000	0.000	0.000	0.000	2.423	0.000	2.4234
5.20	24.96	6.24	4.80	245.52	0.377	12519.447	0.377	1.277	31.073	1.277	0.790	3.539	0.790	0.000	0.000	0.000	0.000	2.444	0.000	2.4438
5.22	25.06	6.34	4.90	246.67	0.377	12773.489	0.377	1.288	34.448	1.288	0.798	4.065	0.798	0.000	0.000	0.000	0.000	2.464	0.000	2.4639
5.24	25.15	6.43	4.99	247.82	0.378	13031.630	0.378	1.299	38.108	1.299	0.807	4.662	0.807	0.000	0.000	0.000	0.000	2.484	0.000	2.4839
5.26	25.25	6.53	5.09	248.98	0.379	13293.917	0.379	1.309	42.070	1.309	0.816	5.336	0.816	0.000	0.000	0.000	0.000	2.504	0.000	2.5036
5.28	25.34	6.62	5.18	250.13	0.380	13560.402	0.380	1.319	46.353	1.319	0.824	6.093	0.824	0.000	0.000	0.000	0.000	2.523	0.000	2.5232
5.30	25.44	6.72	5.28	251.28	0.380	13831.133	0.380	1.330	50.973	1.330	0.833	6.941	0.833	0.000	0.000	0.000	0.000	2.543	0.000	2.5427
5.32	25.54	6.82	5.38	252.43	0.381	14106.162	0.381	1.340	55.951	1.340	0.841	7.886	0.841	0.000	0.000	0.000	0.000	2.562	0.000	2.5620
5.33	25.60	6.88	5.44	253.20	0.382	14291.927	0.382	1.347	59.477	1.347	0.846	8.575	0.846	0.000	0.000	0.000	0.000	2.575	0.000	2.5747
5.34	25.63	6.91	5.47	253.58	0.382	14385.539	0.382	1.350	61.305	1.350	0.849	8.937	0.849	0.000	0.000	0.000	0.000	2.581	0.000	2.5811
5.36	25.73	7.01	5.57	254.74	0.383	14669.316	0.383	1.360	67.056	1.360	0.857	10.102	0.857	0.000	0.000	0.000	0.000	2.600	0.000	2.6000
5.38	25.82	7.10	5.66	255.89	0.383	14957.544	0.383	1.370	73.225	1.370	0.865	11.389	0.865	0.000	0.000	0.000	0.000	2.619	0.000	2.6188
5.40	25.92	7.20	5.76	257.04	0.384	15250.275	0.384	1.380	79.833	1.380	0.873	12.807	0.873	0.000	0.000	0.000	0.000	2.637	0.000	2.6375
5.42	26.02	7.30	5.86	258.19	0.385	15547.561	0.385	1.390	86.903	1.390	0.881	14.365	0.881	0.000	0.000	0.000	0.000	2.656	0.000	2.6560
5.44	26.11	7.39	5.95	259.34	0.385	15849.457	0.385	1.400	94.457	1.400	0.889	16.072	0.889	0.000	0.000	0.000	0.000	2.674	0.000	2.6744
5.46	26.21	7.49	6.05	260.50	0.386	16156.013	0.386	1.409	102.520	1.409	0.897	17.940	0.897	0.000	0.000	0.000	0.000	2.693	0.000	2.6926
5.48	26.30	7.58	6.14	261.65	0.387	16467.286	0.387	1.419	111.115	1.419	0.905	19.977	0.905	0.000	0.000	0.000	0.000	2.711	0.000	2.7107
5.50	26.40	7.68	6.24	262.80	0.388	16783.327	0.388	1.429	120.269	1.429	0.912	22.195	0.912	0.000	0.000	0.000	0.000	2.729	0.000	2.7287
5.52	26.50	7.78	6.34	263.95	0.388	17104.193	0.388	1.438	130.006	1.438	0.920	24.606	0.920	0.000	0.000	0.000	0.000	2.746	0.000	2.7465
5.54	26.59	7.87	6.43	265.10	0.389	17429.937	0.389	1.448	140.355	1.448	0.928	27.220	0.928	0.000	0.000	0.000	0.000	2.764	0.000	2.7642
5.56	26.69	7.97	6.53	266.26	0.390	17760.616	0.390	1.457	151.341	1.457	0.935	30.050	0.935	0.000	0.000	0.000	0.000	2.782	0.000	2.7818
5.58	26.78	8.06	6.62	267.41	0.390	18096.285	0.390	1.466	162.994	1.466	0.942	33.109	0.942	0.000	0.000	0.000	0.000	2.799	0.000	2.7992
5.60	26.88	8.16	6.72	268.56	0.391	18436.999	0.391	1.476	175.343	1.476	0.950	36.409	0.950	0.000	0.000	0.000	0.000	2.817	0.000	2.8166
5.62	26.98	8.26	6.82	269.71	0.392	18782.816	0.392	1.485	188.418	1.485	0.957	39.965	0.957	0.000	0.000	0.000	0.000	2.834	0.000	2.8338

5.64	27.07	8.35	6.91	270.86	0.393	19133.793	0.393	1.494	202.249	1.494	0.964	43.789	0.964	0.000	0.000	0.000	0.000	2.851	0.000	2.8509
5.66	27.17	8.45	7.01	272.02	0.393	19489.987	0.393	1.503	216.868	1.503	0.972	47.897	0.972	0.000	0.000	0.000	0.000	2.868	0.000	2.8679
5.67	27.20	8.48	7.04	272.40	0.394	19609.887	0.394	1.506	221.922	1.506	0.974	49.332	0.974	0.000	0.000	0.000	0.000	2.874	0.000	2.8736
5.68	27.26	8.54	7.10	273.17	0.394	19851.455	0.394	1.512	232.308	1.512	0.979	52.303	0.979	0.000	0.000	0.000	0.000	2.885	0.000	2.8848
5.70	27.36	8.64	7.20	274.32	0.395	20218.257	0.395	1.521	248.601	1.521	0.986	57.023	0.986	0.000	0.000	0.000	0.000	2.902	0.000	2.9016
5.72	27.46	8.74	7.30	275.47	0.395	20590.450	0.395	1.530	265.782	1.530	0.993	62.073	0.993	0.000	0.000	0.000	0.000	2.918	0.000	2.9183
5.74	27.55	8.83	7.39	276.62	0.396	20968.095	0.396	1.539	283.886	1.539	1.000	67.469	1.000	0.000	0.000	0.000	0.000	2.935	0.000	2.9349
5.76	27.65	8.93	7.49	277.78	0.397	21351.249	0.397	1.548	302.948	1.548	1.007	73.228	1.007	0.000	0.000	0.000	0.000	2.951	0.000	2.9514
5.78	27.74	9.02	7.58	278.93	0.398	21739.974	0.398	1.557	323.007	1.557	1.014	79.368	1.014	0.000	0.000	0.000	0.000	2.968	0.000	2.9678
5.80	27.84	9.12	7.68	280.08	0.398	22134.330	0.398	1.565	344.098	1.565	1.020	85.906	1.020	0.000	0.000	0.000	0.000	2.984	0.000	2.9841
5.82	27.94	9.22	7.78	281.23	0.399	22534.377	0.399	1.574	366.262	1.574	1.027	92.862	1.027	0.000	0.000	0.000	0.000	3.000	0.000	3.0002
5.83	28.00	9.28	7.84	282.00	0.399	22804.268	0.399	1.580	381.653	1.580	1.032	97.740	1.032	0.000	0.000	0.000	0.000	3.011	0.000	3.0110
5.84	28.03	9.31	7.87	282.38	0.400	22940.178	0.400	1.583	389.537	1.583	1.034	100.253	1.034	0.000	0.000	0.000	0.000	3.016	0.000	3.0163
5.86	28.13	9.41	7.97	283.54	0.400	23351.792	0.400	1.591	413.965	1.591	1.041	108.101	1.041	0.000	0.000	0.000	0.000	3.032	0.000	3.0323
5.88	28.22	9.50	8.06	284.69	0.401	23769.284	0.401	1.600	439.586	1.600	1.047	116.425	1.047	0.000	0.000	0.000	0.000	3.048	0.000	3.0483
5.90	28.32	9.60	8.16	285.84	0.402	24192.715	0.402	1.608	466.443	1.608	1.054	125.245	1.054	0.000	0.000	0.000	0.000	3.064	0.000	3.0641
5.92	28.42	9.70	8.26	286.99	0.402	24622.148	0.402	1.617	494.579	1.617	1.061	134.584	1.061	0.000	0.000	0.000	0.000	3.080	0.000	3.0798
5.94	28.51	9.79	8.35	288.14	0.403	25057.647	0.403	1.625	524.040	1.625	1.067	144.464	1.067	0.000	0.000	0.000	0.000	3.095	0.000	3.0955
5.96	28.61	9.89	8.45	289.30	0.404	25499.276	0.404	1.634	554.869	1.634	1.074	154.906	1.074	0.000	0.000	0.000	0.000	3.111	0.000	3.1110
5.98	28.70	9.98	8.54	290.45	0.404	25947.098	0.404	1.642	587.114	1.642	1.080	165.934	1.080	0.000	0.000	0.000	0.000	3.127	0.000	3.1265
6.00	28.80	10.08	8.64	291.60	0.405	26401.180	0.405	1.650	620.823	1.650	1.087	177.572	1.087	0.000	0.000	0.000	0.000	3.142	0.000	3.1419
6.02	28.90	10.18	8.74	292.75	0.406	26861.586	0.406	1.658	656.043	1.658	1.093	189.844	1.093	0.000	0.000	0.000	0.014	3.171	0.000	3.1710
6.04	28.99	10.27	8.83	293.90	0.407	27328.382	0.407	1.667	692.824	1.667	1.099	202.775	1.099	0.000	0.000	0.000	0.039	3.211	0.000	3.2115
6.06	29.09	10.37	8.93	295.06	0.407	27801.634	0.407	1.675	731.216	1.675	1.106	216.392	1.106	0.000	0.000	0.000	0.072	3.259	0.000	3.2592
6.08	29.18	10.46	9.02	296.21	0.408	28281.408	0.408	1.683	771.272	1.683	1.112	230.719	1.112	0.000	0.000	0.000	0.110	3.313	0.000	3.3129
6.10	29.28	10.56	9.12	297.36	0.409	28767.772	0.409	1.691	813.043	1.691	1.118	245.785	1.118	0.000	0.000	0.000	0.154	3.372	0.000	3.3717
6.12	29.38	10.66	9.22	298.51	0.409	29260.794	0.409	1.699	856.585	1.699	1.124	261.616	1.124	0.000	0.000	0.000	0.202	3.435	0.041	3.4764
6.14	29.47	10.75	9.31	299.66	0.410	29760.541	0.410	1.707	901.950	1.707	1.130	278.241	1.130	0.000	0.000	0.000	0.255	3.503	0.117	3.6195
6.16	29.57	10.85	9.41	300.82	0.411	30267.081	0.411	1.715	949.197	1.715	1.137	295.689	1.137	0.000	0.000	0.000	0.312	3.574	0.215	3.7887
6.17	29.62	10.90	9.46	301.39	0.411	30522.921	0.411	1.719	973.543	1.719	1.140	304.731	1.140	0.000	0.000	0.000	0.341	3.611	0.271	3.8816
6.18	29.66	10.94	9.50	301.97	0.411	30780.484	0.411	1.723	998.380	1.723	1.143	313.990	1.143	0.000	0.000	0.000	0.372	3.649	0.331	3.9795
6.20	29.76	11.04	9.60	303.12	0.412	31300.820	0.412	1.731	1049.560	1.731	1.149	333.173	1.149	0.000	0.000	0.000	0.436	3.727	0.462	4.1892
6.22	29.86	11.14	9.70	304.27	0.413	31828.157	0.413	1.739	1102.795	1.739	1.155	353.271	1.155	0.000	0.000	0.000	0.502	3.809	0.607	4.4161
6.24	29.95	11.23	9.79	305.42	0.413	32362.566	0.413	1.747	1158.145	1.747	1.161	374.314	1.161	0.000	0.000	0.000	0.573	3.893	0.765	4.6586
6.26	30.05	11.33	9.89	306.58	0.414	32904.118	0.414	1.754	1215.673	1.754	1.167	396.335	1.167	0.000	0.000	0.000	0.646	3.981	0.935	4.9158
6.28	30.14	11.42	9.98	307.73	0.415	33452.885	0.415	1.762	1275.440	1.762	1.173	419.367	1.173	0.000	0.000	0.000	0.721	4.071	1.116	5.1867
6.30	30.24	11.52	10.08	308.88	0.415	34008.937	0.415	1.770	1337.512	1.770	1.179	443.445	1.179	0.000	0.000	0.000	0.800	4.164	1.307	5.4707
6.32	30.34	11.62	10.18	310.03	0.416	34572.348	0.416	1.778	1401.954	1.778	1.185	468.602	1.185	0.000	0.000	0.000	0.881	4.260	1.507	5.7671
6.33	30.38	11.66	10.22	310.61	0.416	34856.835	0.416	1.781	1435.083	1.781	1.188	481.596	1.188	0.000	0.000	0.000	0.923	4.308	1.611	5.9198
6.34	30.43	11.71	10.27	311.18	0.417	35143.189	0.417	1.785	1468.830	1.785	1.190	494.874	1.190	0.000	0.000	0.000	0.965	4.358	1.718	6.0754
6.36	30.53	11.81	10.37	312.34	0.417	35721.534	0.417	1.793	1538.211	1.793	1.196	522.297	1.196	0.000	0.000	0.000	1.052	4.458	1.937	6.3951
6.38	30.62	11.90	10.46	313.49	0.418	36307.457	0.418	1.800	1610.163	1.800	1.202	550.908	1.202	0.000	0.000	0.000	1.141	4.561	2.164	6.7257
6.40	30.72	12.00	10.56	314.64	0.419	36901.032	0.419	1.808	1684.758	1.808	1.208	580.745	1.208	0.000	0.000	0.000	1.232	4.667	2.400	7.0669
6.42	30.82	12.10	10.66	315.79	0.419	37502.332	0.419	1.816	1762.066	1.816	1.214	611.846	1.214	0.000	0.000	0.000	1.325	4.774	2.644	7.4184
6.44	30.91	12.19	10.75	316.94	0.420	38111.434	0.420	1.823	1842.161	1.823	1.219	644.250	1.219	0.000	0.000	0.000	1.421	4.884	2.896	7.7798
6.46	31.01	12.29	10.85	318.10	0.421	38728.413	0.421	1.831	1925.116	1.831	1.225	677.998	1.225	0.000	0.000	0.000	1.519	4.996	3.155	8.1509
6.48	31.10	12.38	10.94	319.25	0.421	39353.345	0.421	1.838	2011.006	1.838	1.231	713.129	1.231	0.000	0.000	0.000	1.619	5.109	3.422	8.5314
6.50	31.20	12.48	11.04	320.40	0.422	39986.307	0.422	1.845	2099.907	1.845	1.236	749.686	1.236	0.000	0.000	0.000	1.722	5.225	3.696	8.9211
6.52	31.30	12.58	11.14	321.55	0.423	40627.374	0.423	1.853	2191.898	1.853	1.242	787.711	1.242	0.000	0.000	0.000	1.765	5.282	3.976	9.2587
6.54	31.39	12.67	11.23	322.70	0.423	41276.626	0.423	1.860	2287.057	1.860	1.248	827.246	1.248	0.000	0.000	0.000	1.799	5.330	4.264	9.5933
6.56	31.49	12.77	11.33	323.86	0.424	41934.139	0.424	1.867	2385.465	1.867	1.253	868.338	1.253	0.000	0.000	0.000	1.832	5.376	4.558	9.9338
6.58	31.58	12.86	11.42	325.01	0.425	42599.993	0.425	1.875	2487.204	1.875	1.259	911.029	1.259	0.000	0.000	0.000	1.864	5.422	4.858	10.2802
6.60	31.68	12.96	11.52	326.16	0.425	43274.267	0.425	1.882	2592.356	1.882	1.264	955.366	1.264	0.000	0.000	0.000	1.896	5.467	5.165	10.6323
6.62	31.78	13.06	11.62	327.31	0.426	43957.039	0.426	1.889	2701.006	1.889	1.270	1001.395	1.270	0.000	0.000	0.000	1.927	5.512	5.295	10.8071
6.64	31.87	13.15	11.71	328.46	0.427	44648.390	0.427	1.896	2813.239	1.896	1.275	1049.165	1.275	0.000	0.000	0.000	1.958	5.556	5.396	10.9522
6.66	31.97	13.25	11.81	329.62	0.427	45348.401	0.427	1.904	2929.143	1.904	1.281	1098.722	1.281	0.000	0.000	0.000	1.988	5.600	5.495	11.0948
6.67	32.02	13.30	11.86	330.19	0.428	45701.678	0.428	1.907	2988.500	1.907	1.283	1124.187	1.283	0.000	0.000	0.000	2.003	5.622	5.544	11.1653
6.68	32.06	13.34	11.90	330.77	0.428	46057.151	0.428	1.911	3048.807	1.911	1.286	1150.117	1.286	0.000	0.000	0.000	2.018	5.643	5.592	11.2352
6.70	32.16	13.44	12.00	331.92	0.429	46774.724	0.429	1.918	3172.320	1.918	1.291	1203.399	1.291	0.000	0.000	0.000	2.048	5.686	5.688	11.3735
6.72	32.26	13.54	12.10	333.07	0.429	47501.200	0.429	1.925	3299.773	1.925	1.297	1258.619	1.297	0.000	0.000	0.000	2.077	5.728	5.782	11.5097
6.74	32.35	13.63	12.19	334.22	0.430	48236.662	0.430	1.932	3431.260	1.932	1.302	1315.829	1.302	0.000	0.000	0.000	2.106	5.770	5.874	11.6439
6.76	32.45	13.73	12.29	335.38	0.431	48981.194	0.431	1.939	3566.874	1.939	1.308	1375.083	1.308	0.000	0.000	0.000	2.134	5.811	5.965	11.7763
6.78	32.54	13.82	12.38	336.53	0.431	49734.878	0.431	1.946	3706.712	1.946	1.313	1436.433	1.313	0.000	0.000	0.000	2.162	5.852	6.055	11.9069
6.80	32.64	13.92	12.48	337.68	0.432	50497.799	0.432	1.953	3850.869	1.953	1.318	1499.934	1.318	0.000	0.000	0.000	2.189	5.892	6.143	12.0357

6.82	32.74	14.02	12.58	338.83	0.432	51270.042	0.432	1.960	3999.446	1.960	1.323	1565.641	1.323	0.000	0.000	0.000	2.216	5.932	6.231	12.1630
6.83	32.78	14.06	12.62	339.41	0.433	51659.685	0.433	1.964	4075.422	1.964	1.326	1599.340	1.326	0.000	0.000	0.000	2.230	5.952	6.274	12.2260
6.84	32.83	14.11	12.67	339.98	0.433	52051.690	0.433	1.967	4152.541	1.967	1.329	1633.612	1.329	0.000	0.000	0.000	2.243	5.972	6.317	12.2886
6.86	32.93	14.21	12.77	341.14	0.434	52842.831	0.434	1.974	4310.257	1.974	1.334	1703.904	1.334	0.000	0.000	0.000	2.270	6.011	6.401	12.4128
6.88	33.02	14.30	12.86	342.29	0.434	53643.549	0.434	1.981	4472.696	1.981	1.339	1776.574	1.339	0.000	0.000	0.000	2.296	6.050	6.485	12.5354
6.90	33.12	14.40	12.96	343.44	0.435	54453.932	0.435	1.988	4639.963	1.988	1.344	1851.683	1.344	0.000	0.000	0.000	2.322	6.089	6.568	12.6567
6.92	33.22	14.50	13.06	344.59	0.436	55274.067	0.436	1.995	4812.163	1.995	1.349	1929.290	1.349	0.000	0.000	0.000	2.348	6.127	6.649	12.7766
6.94	33.31	14.59	13.15	345.74	0.436	56104.041	0.436	2.001	4989.405	2.001	1.355	2009.456	1.355	0.000	0.000	0.000	2.373	6.165	6.730	12.8952
6.96	33.41	14.69	13.25	346.90	0.437	56943.942	0.437	2.008	5171.798	2.008	1.360	2092.245	1.360	0.000	0.000	0.000	2.398	6.203	6.809	13.0125
6.98	33.50	14.78	13.34	348.05	0.438	57793.859	0.438	2.015	5359.452	2.015	1.365	2177.719	1.365	0.000	0.000	0.000	2.423	6.240	6.888	13.1286
7.00	33.60	14.88	13.44	349.20	0.438	58653.882	0.438	2.022	5552.479	2.022	1.370	2265.943	1.370	0.000	0.000	0.000	2.448	6.278	6.966	13.2436
7.02	33.70	14.98	13.54	350.35	0.439	59524.099	0.439	2.029	5750.994	2.029	1.375	2356.981	1.375	0.000	0.000	0.000	2.472	6.314	7.043	13.3573
7.04	33.79	15.07	13.63	351.50	0.439	60404.602	0.439	2.035	5955.111	2.035	1.380	2450.900	1.380	0.000	0.000	0.000	2.496	6.351	7.119	13.4700
7.06	33.89	15.17	13.73	352.66	0.440	61295.481	0.440	2.042	6164.947	2.042	1.385	2547.767	1.385	0.000	0.000	0.000	2.520	6.387	7.194	13.5816
7.08	33.98	15.26	13.82	353.81	0.441	62196.827	0.441	2.049	6380.622	2.049	1.390	2647.651	1.390	0.000	0.000	0.000	2.544	6.423	7.269	13.6921
7.10	34.08	15.36	13.92	354.96	0.441	63108.732	0.441	2.055	6602.255	2.055	1.395	2750.621	1.395	0.000	0.000	0.000	2.567	6.459	7.343	13.8016
7.12	34.18	15.46	14.02	356.11	0.442	64031.289	0.442	2.062	6829.968	2.062	1.400	2856.747	1.400	0.000	0.000	0.000	2.590	6.494	7.416	13.9102
7.14	34.27	15.55	14.11	357.26	0.443	64964.591	0.443	2.068	7063.885	2.068	1.405	2966.101	1.405	0.000	0.000	0.000	2.613	6.530	7.488	14.0178
7.16	34.37	15.65	14.21	358.42	0.443	65908.730	0.443	2.075	7304.130	2.075	1.410	3078.755	1.410	0.000	0.000	0.000	2.636	6.564	7.560	14.1244
7.17	34.42	15.70	14.26	358.99	0.444	66384.894	0.444	2.078	7426.666	2.078	1.412	3136.342	1.412	0.000	0.000	0.000	2.647	6.582	7.595	14.1774
7.18	34.46	15.74	14.30	359.57	0.444	66863.802	0.444	2.082	7550.831	2.082	1.415	3194.783	1.415	0.000	0.000	0.000	2.659	6.599	7.631	14.2301
7.20	34.56	15.84	14.40	360.72	0.445	67829.900	0.445	2.088	7804.116	2.088	1.420	3314.259	1.420	0.000	0.000	0.000	2.681	6.634	7.701	14.3350
7.22	34.66	15.94	14.50	361.87	0.445	68807.119	0.445	2.095	8064.114	2.095	1.425	3437.260	1.425	0.000	0.000	0.000	2.703	6.668	7.771	14.4390
7.24	34.75	16.03	14.59	363.02	0.446	69795.556	0.446	2.101	8330.959	2.101	1.430	3563.861	1.430	0.000	0.000	0.000	2.726	6.702	7.840	14.5421
7.26	34.85	16.13	14.69	364.18	0.446	70795.307	0.446	2.108	8604.782	2.108	1.434	3694.142	1.434	0.000	0.000	0.000	2.747	6.736	7.908	14.6445
7.28	34.94	16.22	14.78	365.33	0.447	71806.467	0.447	2.114	8885.720	2.114	1.439	3828.180	1.439	0.000	0.000	0.000	2.769	6.770	7.976	14.7460
7.30	35.04	16.32	14.88	366.48	0.448	72829.135	0.448	2.121	9173.910	2.121	1.444	3966.057	1.444	0.000	0.000	0.000	2.791	6.803	8.044	14.8468
7.32	35.14	16.42	14.98	367.63	0.448	73863.408	0.448	2.127	9469.490	2.127	1.449	4107.853	1.449	0.000	0.000	0.000	2.812	6.836	8.110	14.9468
7.33	35.18	16.46	15.02	368.21	0.449	74384.927	0.449	2.130	9620.095	2.130	1.451	4180.246	1.451	0.000	0.000	0.000	2.823	6.853	8.144	14.9965
7.34	35.23	16.51	15.07	368.78	0.449	74909.385	0.449	2.133	9772.600	2.133	1.454	4253.651	1.454	0.000	0.000	0.000	2.833	6.869	8.177	15.0460
7.36	35.33	16.61	15.17	369.94	0.449	75967.164	0.449	2.140	10083.383	2.140	1.459	4403.534	1.459	0.000	0.000	0.000	2.854	6.902	8.242	15.1445
7.38	35.42	16.70	15.26	371.09	0.450	77036.845	0.450	2.146	10401.9830	2.1462	1.4633	4557.5872	1.463	0.000	0.000	0.000	2.875	6.935	8.307	15.2424
7.40	35.52	16.80	15.36	372.24	0.451	78118.528	0.451	2.153	10728.5452	2.1525	1.4680	4715.8965	1.468	0.000	0.000	0.000	2.896	6.967	8.372	15.3395
7.42	35.62	16.90	15.46	373.39	0.451	79212.314	0.451	2.159	11063.2174	2.1589	1.4728	4878.5487	1.473	0.000	0.000	0.000	2.917	7.000	8.436	15.4359
7.44	35.71	16.99	15.55	374.54	0.452	80318.304	0.452	2.165	11406.1489	2.1652	1.4775	5045.6321	1.477	0.000	0.000	0.000	2.937	7.032	8.500	15.5317
7.46	35.81	17.09	15.65	375.70	0.453	81436.600	0.453	2.171	11757.4909	2.1715	1.4822	5217.2359	1.482	0.000	0.000	0.000	2.957	7.064	8.563	15.6269
7.48	35.90	17.18	15.74	376.85	0.453	82567.303	0.453	2.178	12117.3962	2.1777	1.4869	5393.4507	1.487	0.000	0.000	0.000	2.978	7.095	8.626	15.7214
7.50	36.00	17.28	15.84	378.00	0.454	83710.517	0.454	2.184	12486.0198	2.1840	1.4916	5574.3683	1.492	0.000	0.000	0.000	2.998	7.127	8.688	15.8152
7.52	36.10	17.38	15.94	379.15	0.454	84866.345	0.454	2.190	12863.5182	2.1902	1.4962	5760.0816	1.496	0.000	0.000	0.000	3.018	7.159	8.750	15.9085
7.54	36.19	17.47	16.03	380.30	0.455	86034.891	0.455	2.196	13250.0499	2.1965	1.5009	5950.6847	1.501	0.000	0.000	0.000	3.037	7.190	8.811	16.0012
7.56	36.29	17.57	16.13	381.46	0.456	87216.260	0.456	2.203	13645.7753	2.2027	1.5055	6146.2730	1.506	0.000	0.000	0.000	3.057	7.221	8.872	16.0933
7.58	36.38	17.66	16.22	382.61	0.456	88410.556	0.456	2.209	14050.8566	2.2089	1.5101	6346.9431	1.510	0.000	0.000	0.000	3.077	7.252	8.933	16.1848
7.60	36.48	17.76	16.32	383.76	0.457	89617.886	0.457	2.215	14465.4579	2.2150	1.5147	6552.7929	1.515	0.000	0.000	0.000	3.096	7.283	8.993	16.2757
7.62	36.58	17.86	16.42	384.91	0.457	90838.356	0.457	2.221	14889.7453	2.2212	1.5193	6763.9212	1.519	0.000	0.000	0.000	3.115	7.313	9.053	16.3661
7.64	36.67	17.95	16.51	386.06	0.458	92072.072	0.458	2.227	15323.8868	2.2273	1.5239	6980.4286	1.524	0.000	0.000	0.000	3.134	7.344	9.112	16.4560
7.66	36.77	18.05	16.61	387.22	0.459	93319.142	0.459	2.233	15768.0520	2.2334	1.5284	7202.4165	1.528	0.000	0.000	0.000	3.154	7.374	9.171	16.5453
7.67	36.82	18.10	16.66	387.79	0.459	93947.719	0.459	2.236	15993.9472	2.2365	1.5307	7315.4978	1.531	0.000	0.000	0.000	3.163	7.389	9.201	16.5898
7.68	36.86	18.14	16.70	388.37	0.459	94579.674	0.459	2.240	16222.4130	2.2395	1.5330	7429.9878	1.533	0.000	0.000	0.000	3.172	7.404	9.230	16.6341
7.70	36.96	18.24	16.80	389.52	0.460	95853.777	0.460	2.246	16687.1432	2.2456	1.5375	7663.2466	1.538	0.000	0.000	0.000	3.191	7.434	9.288	16.7224
7.72	37.06	18.34	16.90	390.67	0.461	97141.560	0.461	2.252	17162.4186	2.2517	1.5421	7902.2982	1.542	0.000	0.000	0.000	3.210	7.464	9.346	16.8102
7.74	37.15	18.43	16.99	391.82	0.461	98443.132	0.461	2.258	17648.4166	2.2577	1.5466	8147.2492	1.547	0.000	0.000	0.000	3.229	7.494	9.403	16.8974
7.76	37.25	18.53	17.09	392.98	0.462	99758.603	0.462	2.264	18145.3169	2.2638	1.5511	8398.2078	1.551	0.000	0.000	0.000	3.247	7.524	9.461	16.9842
7.78	37.34	18.62	17.18	394.13	0.462	101088.086	0.462	2.270	18653.3012	2.2698	1.5555	8655.2830	1.556	0.000	0.000	0.000	3.266	7.553	9.517	17.0706
7.80	37.44	18.72	17.28	395.28	0.463	102431.691	0.463	2.276	19172.5529	2.2758	1.5600	8918.5856	1.560	0.000	0.000	0.000	3.284	7.583	9.574	17.1564
7.82	37.54	18.82	17.38	396.43	0.464	103789.530	0.464	2.282	19703.2578	2.2818	1.5645	9188.2273	1.564	0.000	0.000	0.000	3.302	7.612	9.630	17.2418
7.83	37.58	18.86	17.42	397.01	0.464	104473.822	0.464	2.285	19972.9637	2.2848	1.5667	9325.4606	1.567	0.000	0.000	0.000	3.311	7.626	9.658	17.2843
7.84	37.63	18.91	17.47	397.58	0.464	105161.716	0.464	2.288	20245.6034	2.2877	1.5689	9464.3213	1.569	0.000	0.000	0.000	3.320	7.641	9.686	17.3267
7.86	37.73	19.01	17.57	398.74	0.465	106548.362	0.465	2.294	20799.7795	2.2937	1.5733	9746.9823	1.573	0.000	0.000	0.000	3.338	7.670	9.741	17.4112
7.88	37.82	19.10	17.66	399.89	0.465	107949.582	0.465	2.300	21365.9776	2.2996	1.5778	10036.3261	1.578	0.000	0.000	0.000	3.356	7.699	9.797	17.4953
7.90	37.92	19.20	17.76	401.04	0.466	109365.491	0.466	2.306	21944.3916	2.3056	1.5822	10332.4699	1.582	0.000	0.000	0.000	3.374	7.727	9.851	17.5789
7.92	38.02	19.30	17.86	402.19	0.467	110796.204	0.467	2.311	22535.2172	2.3115	1.5866	10635.5324	1.587	0.000	0.000	0.000	3.392	7.756	9.906	17.6621
7.94	38.11	19.39	17.95	403.34	0.467	112241.836	0.467	2.317	23138.6524	2.3174	1.5909	10945.6334	1.591	0.000	0.000	0.000	3.409	7.785	9.960	17.7449
7.96	38.21	19.49	18.05	404.50	0.468	113702.504	0.468	2.323	23754.8970	2.3233	1.5953	11262.8943	1.595	0.000	0.000	0.000	3.427	7.813	10.014	17.8272
7.98	38.30	19.58	18.14	405.65	0.468	115178.324	0.468	2.329	24384.1533	2.3291	1.5997	11587.4378	1.600	0.000	0.000	0.000	3.444	7.841	10.068	17.9092

8.00	38.40	19.68	18.24	406.80	0.469	116669.414	0.469	2.335	25026.6252	2.3350	1.6040	11919.3880	1.604	0.000	0.000	0.000	3.461	7.869	10.121	17.9907

Stage Storage HMP-1 (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
0.00	0	0.000000	1830
0.02	37	0.000840	1830
0.04	73	0.001680	1830
0.06	110	0.002520	1830
0.08	146	0.003360	1830
0.10	183	0.004200	1830
0.12	220	0.005041	1830
0.14	256	0.005881	1830
0.16	293	0.006721	1830
0.17	311	0.007141	1830
0.18	345	0.007922	1917
0.20	413	0.009485	2066
0.22	481	0.011048	2188
0.24	549	0.012611	2289
0.26	617	0.014174	2375
0.28	686	0.015737	2448
0.30	754	0.017300	2512
0.32	822	0.018863	2568
0.33	867	0.019905	230
0.34	895	0.020556	2634
0.36	981	0.022511	2724
0.38	1066	0.024465	2804
0.40	1151	0.026419	2877
0.42	1236	0.028374	2943
0.44	1321	0.030328	3002
0.46	1406	0.032282	3057
0.48	1491	0.034237	3107
0.50	1576	0.036191	3153
0.52	1674	0.038429	3219
0.54	1771	0.040668	3281
0.56	1869	0.042906	3337
0.58	1966	0.045145	3391
0.60	2064	0.047383	3440
0.62	2162	0.049621	3486
0.64	2259	0.051860	3530
0.66	2357	0.054098	3570
0.67	2405	0.055217	3590
0.68	2462	0.056521	3621
0.70	2576	0.059129	3680
0.72	2689	0.061737	3735
0.74	2803	0.064344	3788
0.76	2916	0.066952	3837
0.78	3030	0.069560	3885
0.80	3144	0.072168	3930
0.82	3257	0.074776	3972
0.83	3333	0.076514	4000
0.84	3373	0.077444	4016
0.86	3495	0.080232	4064
0.88	3616	0.083021	4110
0.90	3738	0.085810	4153
0.92	3859	0.088598	4195
0.94	3981	0.091387	4235
0.96	4102	0.094176	4273
0.98	4224	0.096964	4310
1.00	4345	0.099753	4345
1.02	4476	0.102745	4388
1.04	4606	0.105736	4429
1.06	4736	0.108728	4468
1.08	4866	0.111719	4506
1.10	4997	0.114711	4543
1.12	5127	0.117703	4578
1.14	5257	0.120694	4612
1.16	5388	0.123686	4645

Stage Storage HMP-1 (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
1.17	5431	0.124683	4655
1.18	5523	0.126797	4681
1.20	5661	0.129967	4718
1.22	5799	0.133137	4754
1.24	5938	0.136308	4788
1.26	6076	0.139478	4822
1.28	6214	0.142648	4855
1.30	6352	0.145819	4886
1.32	6490	0.148989	4917
1.33	6582	0.151103	4937
1.34	6630	0.152212	4948
1.36	6775	0.155541	4982
1.38	6920	0.158870	5015
1.40	7065	0.162199	5047
1.42	7210	0.165527	5078
1.44	7355	0.168856	5108
1.46	7500	0.172185	5137
1.48	7645	0.175514	5166
1.50	7790	0.178843	5194
1.52	7942	0.182312	5225
1.54	8093	0.185782	5255
1.56	8244	0.189252	5284
1.58	8395	0.192722	5313
1.60	8546	0.196191	5341
1.62	8697	0.199661	5369
1.64	8848	0.203131	5395
1.66	9000	0.206601	5421
1.67	9050	0.207757	5430
1.68	9154	0.210154	5449
1.70	9311	0.213749	5477
1.72	9468	0.217345	5504
1.74	9624	0.220940	5531
1.76	9781	0.224535	5557
1.78	9937	0.228130	5583
1.80	10094	0.231726	5608
1.82	10251	0.235321	5632
1.83	10355	0.237718	5648
1.84	10409	0.238954	5657
1.86	10570	0.242661	5683
1.88	10732	0.246368	5708
1.90	10893	0.250075	5733
1.92	11055	0.253782	5758
1.94	11216	0.257489	5782
1.96	11378	0.261196	5805
1.98	11539	0.264903	5828
2.00	11701	0.268610	5850
2.02	11866	0.272416	5874
2.04	12032	0.276222	5898
2.06	12198	0.280028	5921
2.08	12364	0.283835	5944
2.10	12530	0.287641	5966
2.12	12695	0.291447	5988
2.14	12861	0.295253	6010
2.16	13027	0.299059	6031
2.17	13082	0.300328	6038
2.18	13195	0.302924	6053
2.20	13365	0.306817	6075
2.22	13535	0.310711	6097
2.24	13704	0.314605	6118
2.26	13874	0.318498	6139
2.28	14043	0.322392	6159
2.30	14213	0.326286	6180
2.32	14383	0.330179	6199

Stage Storage HMP-1 (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
2.33	14496	0.332775	6212
2.34	14553	0.334099	6219
2.36	14726	0.338069	6240
2.38	14899	0.342039	6260
2.40	15072	0.346009	6280
2.42	15245	0.349980	6300
2.44	15418	0.353950	6319
2.46	15591	0.357920	6338
2.48	15764	0.361891	6356
2.50	15937	0.365861	6375
2.52	16113	0.369898	6394
2.54	16289	0.373934	6413
2.56	16464	0.377971	6431
2.58	16640	0.382008	6450
2.60	16816	0.386045	6468
2.62	16992	0.390081	6485
2.64	17168	0.394118	6503
2.66	17344	0.398155	6520
2.67	17402	0.399500	6526
2.68	17521	0.402229	6538
2.70	17699	0.406323	6555
2.72	17878	0.410416	6573
2.74	18056	0.414509	6590
2.76	18234	0.418603	6607
2.78	18413	0.422696	6623
2.80	18591	0.426790	6640
2.82	18769	0.430883	6656
2.83	18888	0.433612	6666
2.84	18948	0.434992	6672
2.86	19129	0.439133	6688
2.88	19309	0.443274	6705
2.90	19489	0.447414	6720
2.92	19670	0.451555	6736
2.94	19850	0.455696	6752
2.96	20030	0.459837	6767
2.98	20211	0.463977	6782
3.00	20391	0.468118	6797
3.02	20573	0.472297	6812
3.04	20755	0.476476	6827
3.06	20937	0.480656	6842
3.08	21119	0.484835	6857
3.10	21301	0.489014	6871
3.12	21483	0.493193	6886
3.14	21666	0.497372	6900
3.16	21848	0.501551	6914
3.17	21908	0.502944	6918
3.18	22030	0.505750	6928
3.20	22214	0.509958	6942
3.22	22397	0.514167	6956
3.24	22580	0.518376	6969
3.26	22764	0.522584	6983
3.28	22947	0.526793	6996
3.30	23130	0.531002	7009
3.32	23314	0.535210	7022
3.33	23436	0.538016	7031
3.34	23497	0.539426	7035
3.36	23682	0.543656	7048
3.38	23866	0.547885	7061
3.40	24050	0.552115	7074
3.42	24234	0.556345	7086
3.44	24419	0.560574	7098
3.46	24603	0.564804	7111
3.48	24787	0.569034	7123

Stage Storage HMP-1 (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
3.50	24971	0.573263	7135
3.52	25156	0.577506	7147
3.54	25341	0.581748	7158
3.56	25526	0.585990	7170
3.58	25711	0.590232	7182
3.60	25895	0.594474	7193
3.62	26080	0.598717	7204
3.64	26265	0.602959	7216
3.66	26450	0.607201	7227
3.67	26511	0.608615	7230
3.68	26635	0.611446	7238
3.70	26820	0.615692	7249
3.72	27005	0.619939	7259
3.74	27190	0.624185	7270
3.76	27374	0.628432	7280
3.78	27559	0.632678	7291
3.80	27744	0.636924	7301
3.82	27929	0.641171	7311
3.83	28053	0.644002	7318
3.84	28114	0.645416	7321
3.86	28299	0.649658	7331
3.88	28484	0.653900	7341
3.90	28669	0.658142	7351
3.92	28853	0.662385	7361
3.94	29038	0.666627	7370
3.96	29223	0.670869	7380
3.98	29408	0.675111	7389
4.00	29593	0.679353	7398
4.02	29777	0.683583	7407
4.04	29961	0.687813	7416
4.06	30145	0.692042	7425
4.08	30330	0.696272	7434
4.10	30514	0.700502	7442
4.12	30698	0.704731	7451
4.14	30882	0.708961	7460
4.16	31067	0.713191	7468
4.17	31128	0.714601	7471
4.18	31250	0.717406	7476
4.20	31434	0.721615	7484
4.22	31617	0.725824	7492
4.24	31800	0.730032	7500
4.26	31984	0.734241	7508
4.28	32167	0.738450	7516
4.30	32350	0.742658	7523
4.32	32534	0.746867	7531
4.33	32656	0.749673	7536
4.34	32716	0.751066	7538
4.36	32898	0.755245	7546
4.38	33081	0.759424	7553
4.40	33263	0.763603	7560
4.42	33445	0.767782	7567
4.44	33627	0.771961	7574
4.46	33809	0.776140	7580
4.48	33991	0.780319	7587
4.50	34173	0.784499	7594
4.52	34353	0.788639	7600
4.54	34533	0.792780	7606
4.56	34714	0.796921	7613
4.58	34894	0.801062	7619
4.60	35075	0.805202	7625
4.62	35255	0.809343	7631
4.64	35435	0.813484	7637
4.66	35616	0.817625	7643

Stage Storage HMP-1 (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
4.67	35676	0.819005	7645
4.68	35795	0.821734	7648
4.70	35973	0.825827	7654
4.72	36151	0.829921	7659
4.74	36330	0.834014	7664
4.76	36508	0.838107	7670
4.78	36686	0.842201	7675
4.80	36865	0.846294	7680
4.82	37043	0.850388	7685
4.83	37162	0.853116	7689
4.84	37220	0.854462	7690
4.86	37396	0.858499	7695
4.88	37572	0.862535	7699
4.90	37748	0.866572	7704
4.92	37924	0.870609	7708
4.94	38100	0.874646	7712
4.96	38275	0.878682	7717
4.98	38451	0.882719	7721
5.00	38627	0.886756	7725
5.02	38800	0.890726	7729
5.04	38973	0.894696	7733
5.06	39146	0.898667	7736
5.08	39319	0.902637	7740
5.10	39492	0.906607	7743
5.12	39665	0.910578	7747
5.14	39838	0.914548	7751
5.16	40011	0.918518	7754
5.17	40068	0.919842	7755
5.18	40181	0.922437	7757
5.20	40351	0.926331	7760
5.22	40521	0.930225	7763
5.24	40690	0.934118	7765
5.26	40860	0.938012	7768
5.28	41029	0.941906	7771
5.30	41199	0.945799	7773
5.32	41369	0.949693	7776
5.33	41482	0.952289	7778
5.34	41537	0.953558	7778
5.36	41703	0.957364	7780
5.38	41869	0.961170	7782
5.40	42034	0.964976	7784
5.42	42200	0.968782	7786
5.44	42366	0.972588	7788
5.46	42532	0.976395	7790
5.48	42698	0.980201	7792
5.50	42863	0.984007	7793
5.52	43025	0.987714	7794
5.54	43186	0.991421	7795
5.56	43348	0.995128	7796
5.58	43509	0.998835	7797
5.60	43671	1.002542	7798
5.62	43832	1.006249	7799
5.64	43994	1.009956	7800
5.66	44155	1.013663	7801
5.67	44209	1.014899	7802
5.68	44313	1.017296	7802
5.70	44470	1.020891	7802
5.72	44627	1.024486	7802
5.74	44783	1.028082	7802
5.76	44940	1.031677	7802
5.78	45096	1.035272	7802
5.80	45253	1.038868	7802
5.82	45410	1.042463	7802

Stage Storage HMP-1 (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
5.83	45514	1.044860	7802
5.84	45564	1.046016	7802
5.86	45716	1.049486	7801
5.88	45867	1.052956	7800
5.90	46018	1.056426	7800
5.92	46169	1.059895	7799
5.94	46320	1.063365	7798
5.96	46471	1.066835	7797
5.98	46622	1.070304	7796
6.00	46774	1.073774	7796
6.02	46916	1.077038	7793
6.04	47058	1.080301	7791
6.06	47200	1.083565	7789
6.08	47342	1.086828	7787
6.10	47484	1.090092	7784
6.12	47627	1.093355	7782
6.14	47769	1.096619	7780
6.16	47911	1.099882	7778
6.17	47982	1.101514	7777
6.18	48054	1.103165	7776
6.20	48198	1.106468	7774
6.22	48342	1.109770	7772
6.24	48485	1.113073	7770
6.26	48629	1.116375	7768
6.28	48773	1.119678	7766
6.30	48917	1.122980	7765
6.32	49061	1.126282	7763
6.33	49133	1.127934	7762
6.34	49197	1.129400	7760
6.36	49324	1.132333	7755
6.38	49452	1.135266	7751
6.40	49580	1.138199	7747
6.42	49708	1.141132	7743
6.44	49835	1.144065	7738
6.46	49963	1.146998	7734
6.48	50091	1.149931	7730
6.50	50219	1.152864	7726
6.52	50338	1.155598	7721
6.54	50457	1.158332	7715
6.56	50576	1.161066	7710
6.58	50695	1.163800	7704
6.60	50814	1.166534	7699
6.62	50933	1.169268	7694
6.64	51052	1.172002	7689
6.66	51171	1.174736	7683
6.67	51231	1.176103	7681
6.68	51289	1.177434	7678
6.70	51405	1.180096	7672
6.72	51521	1.182758	7667
6.74	51637	1.185420	7661
6.76	51753	1.188082	7656
6.78	51869	1.190744	7650
6.80	51985	1.193406	7645
6.82	52101	1.196068	7639
6.83	52159	1.197400	7637
6.84	52207	1.198519	7633
6.86	52305	1.200757	7625
6.88	52402	1.202995	7617
6.90	52500	1.205234	7609
6.92	52597	1.207472	7601
6.94	52695	1.209711	7593
6.96	52792	1.211949	7585
6.98	52890	1.214187	7577

Stage Storage HMP-1 (Per Contech Table)

Depth	volume (cf)	volume (acft)	Effective Area (s.f.)
7.00	52988	1.216426	7570
7.02	53071	1.218342	7560
7.04	53154	1.220258	7550
7.06	53238	1.222174	7541
7.08	53321	1.224090	7531
7.10	53405	1.226006	7522
7.12	53488	1.227922	7512
7.14	53572	1.229838	7503
7.16	53655	1.231754	7494
7.17	53697	1.232712	7489
7.18	53732	1.233510	7484
7.20	53801	1.235105	7472
7.22	53871	1.236701	7461
7.24	53940	1.238296	7450
7.26	54010	1.239892	7439
7.28	54079	1.241487	7428
7.30	54149	1.243083	7418
7.32	54218	1.244678	7407
7.33	54253	1.245476	7401
7.34	54271	1.245896	7394
7.36	54308	1.246736	7379
7.38	54344	1.247576	7364
7.40	54381	1.248416	7349
7.42	54418	1.249256	7334
7.44	54454	1.250097	7319
7.46	54491	1.250937	7304
7.48	54527	1.251777	7290
7.50	54564	1.252617	7275
7.52	54565	1.253	7256
7.54	54566	1.253	7237
7.56	54567	1.253	7218
7.58	54568	1.253	7199
7.60	54569	1.253	7180
7.62	54570	1.253	7161
7.64	54571	1.253	7143
7.66	54572	1.253	7124
7.67	54572	1.253	7115
7.68	54573	1.253	7106
7.70	54574	1.253	7088
7.72	54575	1.253	7069
7.74	54576	1.253	7051
7.76	54577	1.253	7033
7.78	54578	1.253	7015
7.80	54579	1.253	6997
7.82	54580	1.253	6980
7.83	54581	1.253	6971
7.84	54581	1.253	6962
7.86	54582	1.253	6944
7.88	54583	1.253	6927
7.90	54584	1.253	6909
7.92	54585	1.253	6892
7.94	54586	1.253	6875
7.96	54587	1.253	6858
7.98	54588	1.253	6841
8.00	54589	1.253	6824

HMP-1 Total Draw Down

Depth	Q_{AVG} (CFS)	V (CF)	DT (HR)	Total T
0.00	0.000	0.0	2.481	43.175
0.24	0.062	549.3	0.297	40.694
0.26	0.066	617.4	0.278	40.397
0.28	0.070	685.5	0.263	40.119
0.30	0.074	753.6	0.250	39.856
0.32	0.078	821.7	0.160	39.606
0.33	0.080	867.1	0.098	39.446
0.34	0.081	895.4	0.286	39.348
0.36	0.084	980.6	0.275	39.062
0.38	0.088	1065.7	0.265	38.787
0.40	0.091	1150.8	0.256	38.522
0.42	0.094	1236.0	0.248	38.266
0.44	0.097	1321.1	0.241	38.017
0.46	0.100	1406.2	0.234	37.776
0.48	0.102	1491.4	0.228	37.542
0.50	0.105	1576.5	0.255	37.314
0.52	0.108	1674.0	0.249	37.059
0.54	0.110	1771.5	0.243	36.810
0.56	0.113	1869.0	0.238	36.567
0.58	0.115	1966.5	0.233	36.329
0.60	0.118	2064.0	0.228	36.097
0.62	0.120	2161.5	0.224	35.868
0.64	0.122	2259.0	0.220	35.645
0.66	0.124	2356.5	0.108	35.425
0.67	0.126	2405.3	0.125	35.316
0.68	0.127	2462.1	0.247	35.191
0.70	0.129	2575.7	0.243	34.944
0.72	0.131	2689.3	0.239	34.701
0.74	0.133	2802.8	0.235	34.462
0.76	0.135	2916.4	0.232	34.227
0.78	0.137	3030.0	0.228	33.995
0.80	0.139	3143.6	0.225	33.767
0.82	0.141	3257.2	0.148	33.542
0.83	0.142	3333.0	0.079	33.394
0.84	0.143	3373.4	0.234	33.315
0.86	0.145	3494.9	0.231	33.081
0.88	0.147	3616.4	0.228	32.850
0.90	0.149	3737.9	0.225	32.621
0.92	0.151	3859.3	0.223	32.396
0.94	0.153	3980.8	0.220	32.174
0.96	0.154	4102.3	0.217	31.954
0.98	0.156	4223.8	0.215	31.736
1.00	0.158	4345.2	0.228	31.522
1.02	0.160	4475.6	0.225	31.294
1.04	0.161	4605.9	0.223	31.068
1.06	0.163	4736.2	0.221	30.845
1.08	0.165	4866.5	0.218	30.624
1.10	0.167	4996.8	0.216	30.406
1.12	0.168	5127.1	0.214	30.190
1.14	0.170	5257.4	0.212	29.975

HMP-1 Total Draw Down

1.16	0.171	5387.8	0.070	29.763
1.17	0.172	5431.2	0.148	29.693
1.18	0.173	5523.3	0.221	29.545
1.20	0.175	5661.4	0.219	29.324
1.22	0.176	5799.5	0.217	29.106
1.24	0.178	5937.6	0.215	28.889
1.26	0.179	6075.7	0.213	28.674
1.28	0.181	6213.8	0.211	28.461
1.30	0.182	6351.9	0.209	28.250
1.32	0.184	6490.0	0.139	28.041
1.33	0.185	6582.0	0.072	27.902
1.34	0.186	6630.4	0.216	27.830
1.36	0.187	6775.4	0.215	27.614
1.38	0.188	6920.4	0.213	27.399
1.40	0.190	7065.4	0.211	27.186
1.42	0.191	7210.4	0.210	26.975
1.44	0.193	7355.4	0.208	26.765
1.46	0.194	7500.4	0.207	26.557
1.48	0.196	7645.4	0.205	26.351
1.50	0.197	7790.4	0.212	26.146
1.52	0.199	7941.5	0.211	25.933
1.54	0.200	8092.7	0.209	25.723
1.56	0.201	8243.8	0.208	25.513
1.58	0.203	8394.9	0.206	25.306
1.60	0.204	8546.1	0.205	25.099
1.62	0.205	8697.2	0.204	24.894
1.64	0.207	8848.4	0.202	24.691
1.66	0.208	8999.5	0.067	24.488
1.67	0.209	9049.9	0.139	24.421
1.68	0.209	9154.3	0.207	24.282
1.70	0.211	9310.9	0.206	24.075
1.72	0.212	9467.5	0.204	23.870
1.74	0.213	9624.1	0.203	23.665
1.76	0.215	9780.8	0.202	23.462
1.78	0.216	9937.4	0.201	23.260
1.80	0.217	10094.0	0.200	23.059
1.82	0.219	10250.6	0.132	22.860
1.83	0.219	10355.0	0.068	22.727
1.84	0.220	10408.8	0.203	22.659
1.86	0.221	10570.3	0.202	22.456
1.88	0.222	10731.8	0.201	22.253
1.90	0.224	10893.3	0.200	22.052
1.92	0.225	11054.7	0.199	21.852
1.94	0.226	11216.2	0.198	21.653
1.96	0.227	11377.7	0.197	21.455
1.98	0.229	11539.2	0.196	21.259
2.00	0.230	11700.6	0.200	21.063
2.02	0.231	11866.4	0.199	20.863
2.04	0.232	12032.2	0.198	20.664
2.06	0.233	12198.0	0.197	20.466
2.08	0.235	12363.8	0.196	20.269
2.10	0.236	12529.6	0.195	20.073
2.12	0.237	12695.4	0.194	19.879
2.14	0.238	12861.2	0.193	19.685
2.16	0.239	13027.0	0.064	19.492
2.17	0.240	13082.3	0.131	19.428
2.18	0.240	13195.4	0.195	19.297
2.20	0.242	13365.0	0.195	19.101
2.22	0.243	13534.6	0.194	18.907
2.24	0.244	13704.2	0.193	18.713
2.26	0.245	13873.8	0.192	18.520
2.28	0.246	14043.4	0.191	18.328
2.30	0.247	14213.0	0.190	18.138
2.32	0.248	14382.6	0.126	17.947

#REF!

HMP-1 Total Draw Down

2.33	0.249	14495.7	0.064	17.821		
2.34	0.250	14553.3	0.192	17.757		
2.36	0.251	14726.3	0.191	17.565		
2.38	0.252	14899.2	0.190	17.374		
2.40	0.253	15072.2	0.190	17.183		
2.42	0.254	15245.1	0.189	16.994		
2.44	0.255	15418.1	0.188	16.805		
2.46	0.256	15591.0	0.187	16.617		
2.48	0.257	15764.0	0.186	16.430		
2.50	0.258	15936.9	0.189	16.243		
2.52	0.259	16112.7	0.188	16.055		
2.54	0.260	16288.6	0.187	15.867		
2.56	0.262	16464.4	0.186	15.679		
2.58	0.263	16640.3	0.186	15.493		
2.60	0.264	16816.1	0.185	15.307		
2.62	0.265	16991.9	0.184	15.123		
2.64	0.266	17167.8	0.183	14.938		
2.66	0.267	17343.6	0.061	14.755		
2.67	0.267	17402.2	0.123	14.694		
2.68	0.268	17521.1	0.185	14.570		
2.70	0.269	17699.4	0.184	14.386		
2.72	0.270	17877.7	0.183	14.202		
2.74	0.271	18056.0	0.182	14.019		
2.76	0.272	18234.3	0.182	13.836		
2.78	0.273	18412.6	0.181	13.655		
2.80	0.274	18591.0	0.180	13.473		
2.82	0.275	18769.3	0.120	13.293		
2.83	0.276	18888.1	0.061	13.173		
2.84	0.276	18948.3	0.181	13.113		
2.86	0.277	19128.6	0.181	12.931		
2.88	0.278	19309.0	0.180	12.751		
2.90	0.279	19489.4	0.179	12.571		
2.92	0.280	19669.7	0.179	12.392		
2.94	0.281	19850.1	0.178	12.213		
2.96	0.282	20030.5	0.177	12.035		
2.98	0.283	20210.9	0.177	11.858		
3.00	0.284	20391.2	0.178	11.681		
3.02	0.285	20573.3	0.177	11.503		
3.04	0.286	20755.3	0.177	11.326		
3.06	0.287	20937.4	0.176	11.149		
3.08	0.288	21119.4	0.175	10.973		
3.10	0.289	21301.4	0.175	10.798		
3.12	0.290	21483.5	0.174	10.623		
3.14	0.291	21665.5	0.174	10.449		
3.16	0.292	21847.6	0.058	10.275		
3.17	0.292	21908.2	0.116	10.218		
3.18	0.293	22030.5	0.174	10.102		
3.20	0.294	22213.8	0.173	9.928		
3.22	0.295	22397.1	0.173	9.755		
3.24	0.295	22580.4	0.172	9.582		
3.26	0.296	22763.8	0.172	9.410		
3.28	0.297	22947.1	0.171	9.239	WQ Draw Down =	35.2945
3.30	0.298	23130.4	0.170	9.068		
3.32	0.299	23313.8	0.113	8.897		
3.33	0.300	23436.0	0.057	8.784		
3.34	0.300	23497.4	0.170	8.727		
3.36	0.301	23681.6	0.170	8.557		
3.38	0.302	23865.9	0.169	8.387		
3.40	0.303	24050.1	0.169	8.218		
3.42	0.304	24234.4	0.168	8.049		
3.44	0.305	24418.6	0.168	7.881		
3.46	0.306	24602.9	0.167	7.713		
3.48	0.307	24787.1	0.167	7.546		
3.50	0.308	24971.4	0.167	7.379		

HMP- 1 Total Draw Down

3.52	0.308	25156.1	0.166	7.213
3.54	0.309	25340.9	0.166	7.047
3.56	0.310	25525.7	0.165	6.881
3.58	0.311	25710.5	0.165	6.716
3.60	0.312	25895.3	0.164	6.551
3.62	0.313	26080.1	0.164	6.387
3.64	0.314	26264.9	0.163	6.223
3.66	0.315	26449.7	0.054	6.059
3.67	0.315	26511.3	0.109	6.005
3.68	0.316	26634.6	0.163	5.896
3.70	0.316	26819.6	0.162	5.734
3.72	0.317	27004.5	0.162	5.572
3.74	0.318	27189.5	0.161	5.410
3.76	0.319	27374.5	0.161	5.249
3.78	0.320	27559.5	0.160	5.088
3.80	0.321	27744.4	0.160	4.927
3.82	0.322	27929.4	0.106	4.767
3.83	0.322	28052.7	0.053	4.661
3.84	0.323	28114.3	0.159	4.608
3.86	0.323	28299.1	0.159	4.449
3.88	0.324	28483.9	0.158	4.291
3.90	0.325	28668.7	0.157	4.132
3.92	0.330	28853.5	0.152	3.976
3.94	0.344	29038.3	0.145	3.824
3.96	0.365	29223.1	0.135	3.679
3.98	0.393	29407.8	0.125	3.543
4.00	0.428	29592.6	0.114	3.418
4.02	0.468	29776.9	0.104	3.304
4.04	0.513	29961.1	0.095	3.200
4.06	0.563	30145.4	0.087	3.105
4.08	0.616	30329.6	0.080	3.018
4.10	0.671	30513.9	0.073	2.938
4.12	0.727	30698.1	0.069	2.865
4.14	0.766	30882.3	0.065	2.796
4.16	0.797	31066.6	0.021	2.731
4.17	0.807	31128.0	0.042	2.710
4.18	0.827	31250.2	0.061	2.668
4.20	0.855	31433.6	0.059	2.608
4.22	0.884	31616.9	0.056	2.549
4.24	0.919	31800.2	0.054	2.493
4.26	0.958	31983.5	0.052	2.438
4.28	1.001	32166.9	0.050	2.386
4.30	1.048	32350.2	0.047	2.337
4.32	1.098	32533.5	0.030	2.289
4.33	1.133	32655.7	0.015	2.259
4.34	1.151	32716.4	0.043	2.244
4.36	1.206	32898.5	0.041	2.201
4.38	1.263	33080.5	0.039	2.160
4.40	1.322	33262.6	0.037	2.121
4.42	1.381	33444.6	0.036	2.083
4.44	1.426	33626.6	0.035	2.047
4.46	1.466	33808.7	0.034	2.012
4.48	1.505	33990.7	0.033	1.978
4.50	1.542	34172.8	0.032	1.945
4.52	1.577	34353.1	0.031	1.913
4.54	1.612	34533.5	0.031	1.882
4.56	1.645	34713.9	0.030	1.851
4.58	1.678	34894.2	0.030	1.821
4.60	1.709	35074.6	0.029	1.791
4.62	1.740	35255.0	0.029	1.762
4.64	1.770	35435.4	0.028	1.734
4.66	1.800	35615.7	0.009	1.705
4.67	1.810	35675.8	0.018	1.696
4.68	1.829	35794.7	0.027	1.678

HMP-1 Total Draw Down

4.70	1.857	35973.0	0.026	1.651
4.72	1.885	36151.3	0.026	1.625
4.74	1.912	36329.6	0.026	1.599
4.76	1.939	36508.0	0.025	1.573
4.78	1.965	36686.3	0.025	1.548
4.80	1.991	36864.6	0.025	1.522
4.82	2.017	37042.9	0.016	1.498
4.83	2.033	37161.8	0.008	1.481
4.84	2.042	37220.4	0.024	1.473
4.86	2.067	37396.2	0.023	1.450
4.88	2.091	37572.0	0.023	1.426
4.90	2.115	37747.9	0.023	1.403
4.92	2.139	37923.7	0.023	1.380
4.94	2.162	38099.6	0.022	1.357
4.96	2.185	38275.4	0.022	1.335
4.98	2.208	38451.2	0.022	1.313
5.00	2.231	38627.1	0.021	1.291
5.02	2.253	38800.0	0.021	1.269
5.04	2.275	38973.0	0.021	1.248
5.06	2.297	39145.9	0.021	1.227
5.08	2.319	39318.9	0.021	1.206
5.10	2.340	39491.8	0.020	1.185
5.12	2.361	39664.8	0.020	1.165
5.14	2.382	39837.7	0.020	1.145
5.16	2.403	40010.7	0.007	1.125
5.17	2.410	40068.3	0.013	1.118
5.18	2.423	40181.4	0.019	1.105
5.20	2.444	40351.0	0.019	1.086
5.22	2.464	40520.6	0.019	1.067
5.24	2.484	40690.2	0.019	1.047
5.26	2.504	40859.8	0.019	1.029
5.28	2.523	41029.4	0.019	1.010
5.30	2.543	41199.0	0.018	0.991
5.32	2.562	41368.6	0.012	0.973
5.33	2.575	41481.7	0.006	0.961
5.34	2.581	41537.0	0.018	0.955
5.36	2.600	41702.8	0.018	0.937
5.38	2.619	41868.6	0.018	0.919
5.40	2.637	42034.4	0.017	0.902
5.42	2.656	42200.2	0.017	0.884
5.44	2.674	42366.0	0.017	0.867
5.46	2.693	42531.7	0.017	0.850
5.48	2.711	42697.5	0.017	0.833
5.50	2.729	42863.3	0.016	0.816
5.52	2.746	43024.8	0.016	0.799
5.54	2.764	43186.3	0.016	0.783
5.56	2.782	43347.8	0.016	0.767
5.58	2.799	43509.3	0.016	0.751
5.60	2.817	43670.7	0.016	0.735
5.62	2.834	43832.2	0.016	0.719
5.64	2.851	43993.7	0.016	0.703
5.66	2.868	44155.2	0.005	0.688
5.67	2.874	44209.0	0.010	0.682
5.68	2.885	44313.4	0.015	0.672
5.70	2.902	44470.0	0.015	0.657
5.72	2.918	44626.6	0.015	0.642
5.74	2.935	44783.2	0.015	0.627
5.76	2.951	44939.8	0.015	0.613
5.78	2.968	45096.5	0.015	0.598
5.80	2.984	45253.1	0.015	0.583
5.82	3.000	45409.7	0.010	0.569
5.83	3.011	45514.1	0.005	0.559
5.84	3.016	45564.5	0.014	0.555
5.86	3.032	45715.6	0.014	0.541

HMP- 1 Total Draw Down

5.88	3.048	45866.8	0.014	0.527
5.90	3.064	46017.9	0.014	0.513
5.92	3.080	46169.0	0.014	0.499
5.94	3.095	46320.2	0.014	0.486
5.96	3.111	46471.3	0.013	0.472
5.98	3.127	46622.5	0.013	0.459
6.00	3.142	46773.6	0.013	0.445
6.02	3.171	46915.8	0.012	0.433
6.04	3.211	47057.9	0.012	0.421
6.06	3.259	47200.1	0.012	0.408
6.08	3.313	47342.2	0.012	0.396
6.10	3.372	47484.4	0.012	0.385
6.12	3.435	47626.6	0.011	0.373
6.14	3.503	47768.7	0.011	0.362
6.16	3.574	47910.9	0.005	0.350
6.17	3.611	47982.0	0.006	0.345
6.18	3.649	48053.9	0.011	0.339
6.20	3.727	48197.7	0.011	0.329
6.22	3.809	48341.6	0.010	0.318
6.24	3.893	48485.4	0.010	0.308
6.26	3.981	48629.3	0.010	0.297
6.28	4.071	48773.2	0.010	0.287
6.30	4.164	48917.0	0.009	0.278
6.32	4.260	49060.9	0.005	0.268
6.33	4.308	49132.8	0.004	0.264
6.34	4.358	49196.7	0.008	0.260
6.36	4.458	49324.4	0.008	0.251
6.38	4.561	49452.2	0.008	0.244
6.40	4.667	49579.9	0.008	0.236
6.42	4.774	49707.7	0.007	0.228
6.44	4.884	49835.5	0.007	0.221
6.46	4.996	49963.2	0.007	0.214
6.48	5.109	50091.0	0.007	0.207
6.50	5.225	50218.7	0.006	0.200
6.52	5.282	50337.8	0.006	0.194
6.54	5.330	50456.9	0.006	0.187
6.56	5.376	50576.0	0.006	0.181
6.58	5.422	50695.1	0.006	0.175
6.60	5.467	50814.2	0.006	0.169
6.62	5.512	50933.3	0.006	0.163
6.64	5.556	51052.4	0.006	0.157
6.66	5.600	51171.5	0.003	0.151
6.67	5.622	51231.0	0.003	0.148
6.68	5.643	51289.0	0.006	0.145
6.70	5.686	51405.0	0.006	0.140
6.72	5.728	51520.9	0.006	0.134
6.74	5.770	51636.9	0.006	0.128
6.76	5.811	51752.9	0.006	0.123
6.78	5.852	51868.8	0.005	0.117
6.80	5.892	51984.8	0.005	0.112
6.82	5.932	52100.7	0.003	0.106
6.83	5.952	52158.7	0.002	0.104
6.84	5.972	52207.5	0.005	0.101
6.86	6.011	52305.0	0.004	0.097
6.88	6.050	52402.5	0.004	0.092
6.90	6.089	52500.0	0.004	0.088
6.92	6.127	52597.5	0.004	0.083
6.94	6.165	52695.0	0.004	0.079
6.96	6.203	52792.5	0.004	0.075
6.98	6.240	52890.0	0.004	0.070
7.00	6.278	52987.5	0.004	0.066
7.02	6.314	53071.0	0.004	0.062
7.04	6.351	53154.4	0.004	0.059
7.06	6.387	53237.9	0.004	0.055

HMP-1 Total Draw Down

7.08	6.423	53321.4	0.004	0.051
7.10	6.459	53404.8	0.004	0.048
7.12	6.494	53488.3	0.004	0.044
7.14	6.530	53571.7	0.004	0.041
7.16	6.564	53655.2	0.002	0.037
7.17	6.582	53696.9	0.001	0.035
7.18	6.599	53731.7	0.003	0.034
7.20	6.634	53801.2	0.003	0.031
7.22	6.668	53870.7	0.003	0.028
7.24	6.702	53940.2	0.003	0.025
7.26	6.736	54009.7	0.003	0.022
7.28	6.770	54079.2	0.003	0.019
7.30	6.803	54148.7	0.003	0.017
7.32	6.836	54218.2	0.001	0.014
7.33	6.853	54252.9	0.001	0.012
7.34	6.869	54271.2	0.001	0.012
7.36	6.902	54307.8	0.001	0.010
7.38	6.935	54344.4	0.001	0.009
7.40	6.967	54381.0	0.001	0.007
7.42	7.000	54417.6	0.001	0.006
7.44	7.032	54454.2	0.001	0.004
7.46	7.064	54490.8	0.001	0.003
7.48	7.095	54527.4	0.001	0.001
7.50	7.127	54564.0		

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

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

START_DATE           10/17/1948
START_TIME           08:00:00
REPORT_START_DATE    10/17/1948
REPORT_START_TIME    08:00:00
END_DATE             12/31/2005
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          01:00:00
WET_STEP             00:15:00
DRY_STEP             01:00:00
ROUTING_STEP         0:01:00
RULE_STEP            00:00:00

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

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
MONTHLY          .06    .08    .11    0.16   0.18   0.21   0.21   0.2    0.16   0.12   .08    .06
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- ------ ------ ----------
Lindbergh        VOLUME    1:00     1.0      TIMESERIES Lindbergh

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------------
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DMA-2            Lindbergh        BF-1-2           0.58     67.4     100      1        0
BF-1-2           Lindbergh        div1             0.051    0        100      0.1      0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
DMA-2            0.012      0.1        0.05       0.1        25         OUTLET
BF-1-2           0.012      0.15       0.05       0.1        25         OUTLET

[INFILTRATION]
;;Subcatchment   Suction    Ksat       IMD
;;-------------- ---------- ---------- ----------
DMA-2            9          0.01875    0.3
BF-1-2           1.5        0.3        0.33

[LID_CONTROLS]
;;Name           Type/Layer Parameters
;;-------------- ---------- ----------
BF-1-2           BC
BF-1-2           SURFACE    6          0.0        0          0          5
BF-1-2           SOIL       24         0.4        0.2        0.1        5          5          1.5
BF-1-2           STORAGE    12         0.67       0          0
BF-1-2           DRAIN      0.1254     0.5        3          6          0          0

[LID_USAGE]
;;Subcatchment   LID Process      Number  Area       Width      InitSat    FromImp    ToPerv     RptFile                  DrainTo
FromPerv
;;-------------- ---------------- ------- ---------- ---------- ---------- ---------- ---------- ------------------------ ----------------
----------
BF-1-2           BF-1-2           1       800        0          0          100        0          *                        *               0


[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
POC-2            0          FREE                        NO

[DIVIDERS]
;;Name           Elevation  Diverted Link    Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
DIV1             0          bypass           CUTOFF     0.006      0          0          0          0

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- --------          -------- --------
BF-2             0        4.5        0          TABULAR    Storage-BF-1-2               0        1

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
UN-1             DIV1             POC-2            100        0.013      0          0          0          0
Bypass           DIV1             BF-2             400        0.01       0          0          0          0

[OUTLETS]
;;Name           From Node        To Node          Offset     Type            QTable/Qcoeff    Qexpon     Gated
```

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;;-------------- ---------------- ---------------- ---------- --------------- ---------------- ---------- --------
Outlet-BF-1-2    BF-2             POC-2            0          TABULAR/DEPTH   HMP-2                       NO

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
UN-1             DUMMY        0                0          0          0          1
Bypass           DUMMY        0                0          0          0          1

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
HMP-2            Rating     0.00       0.00000
HMP-2                       0.05       0.00156
HMP-2                       0.10       0.00305
HMP-2                       0.15       0.00395
HMP-2                       0.20       0.00469
HMP-2                       0.25       0.00533
HMP-2                       0.30       0.00589
HMP-2                       0.35       0.00641
HMP-2                       0.40       0.00689
HMP-2                       0.45       0.00734
HMP-2                       0.50       0.00776
HMP-2                       0.55       0.00816
HMP-2                       0.60       0.00854
HMP-2                       0.65       0.00890
HMP-2                       0.70       0.00925
HMP-2                       0.75       0.01819
HMP-2                       0.80       0.03571
HMP-2                       0.85       0.04538
HMP-2                       0.90       0.05304
HMP-2                       0.95       0.05958
HMP-2                       1.00       0.06541
HMP-2                       1.05       0.07071
HMP-2                       1.10       0.07561
HMP-2                       1.15       0.08020
HMP-2                       1.20       0.08452
HMP-2                       1.25       0.08862
HMP-2                       1.30       0.09253
HMP-2                       1.35       0.09627
HMP-2                       1.40       0.09987
HMP-2                       1.45       0.10334
HMP-2                       1.50       0.10669
HMP-2                       1.55       0.12499
HMP-2                       1.60       0.15823
HMP-2                       1.65       0.17767
HMP-2                       1.70       0.19351
HMP-2                       1.75       0.20735
HMP-2                       1.80       0.21988
HMP-2                       1.85       0.23144
HMP-2                       1.90       0.24226
HMP-2                       1.95       0.25247
HMP-2                       2.00       0.26217
HMP-2                       2.05       0.27145
HMP-2                       2.10       0.28036
```

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HMP-2                     2.15       0.28895
HMP-2                     2.20       0.29724
HMP-2                     2.25       0.30528
HMP-2                     2.30       0.31308
HMP-2                     2.35       0.32067
HMP-2                     2.40       0.32806
HMP-2                     2.45       0.33527
HMP-2                     2.50       0.34231
HMP-2                     2.55       0.56321
HMP-2                     2.60       0.96124
HMP-2                     2.65       1.47454
HMP-2                     2.70       2.08105
HMP-2                     2.75       2.76801
HMP-2                     2.80       3.52682
HMP-2                     2.85       4.35115
HMP-2                     2.90       5.23613
HMP-2                     2.95       6.17782
HMP-2                     3.00       7.17295
HMP-2                     3.05       8.21878
HMP-2                     3.10       9.31295
HMP-2                     3.15       10.45339
HMP-2                     3.20       11.63828
HMP-2                     3.25       12.86601
HMP-2                     3.30       14.13513
HMP-2                     3.35       15.44431
HMP-2                     3.40       16.79236
HMP-2                     3.45       18.17818
HMP-2                     3.50       19.60078
HMP-2                     3.55       21.05921
HMP-2                     3.60       22.55261
HMP-2                     3.65       24.08018
HMP-2                     3.70       25.64117
HMP-2                     3.75       27.23487
HMP-2                     3.80       28.86063
HMP-2                     3.85       30.51782
HMP-2                     3.90       32.20586
HMP-2                     3.95       33.92418
HMP-2                     4.00       34.96987
HMP-2                     4.05       35.54411
HMP-2                     4.10       36.10918
HMP-2                     4.15       36.66552
HMP-2                     4.20       37.21352
HMP-2                     4.25       37.75355
HMP-2                     4.30       38.28594
HMP-2                     4.35       38.81101
HMP-2                     4.40       39.32906
HMP-2                     4.45       39.84036
HMP-2                     4.50       40.34516
;
Storage-BF-1-2   Storage  0.00       800
Storage-BF-1-2            0.05       800
Storage-BF-1-2            0.10       800
Storage-BF-1-2            0.15       800
Storage-BF-1-2            0.20       800
Storage-BF-1-2            0.25       800
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Storage-BF-1-2	0.30	800
Storage-BF-1-2	0.35	800
Storage-BF-1-2	0.40	800
Storage-BF-1-2	0.45	800
Storage-BF-1-2	0.50	800
Storage-BF-1-2	0.55	800
Storage-BF-1-2	0.60	800
Storage-BF-1-2	0.65	800
Storage-BF-1-2	0.70	800
Storage-BF-1-2	0.75	800
Storage-BF-1-2	0.80	800
Storage-BF-1-2	0.85	800
Storage-BF-1-2	0.90	800
Storage-BF-1-2	0.95	800
Storage-BF-1-2	1.00	800
Storage-BF-1-2	1.05	800
Storage-BF-1-2	1.10	800
Storage-BF-1-2	1.15	800
Storage-BF-1-2	1.20	800
Storage-BF-1-2	1.25	800
Storage-BF-1-2	1.30	800
Storage-BF-1-2	1.35	800
Storage-BF-1-2	1.40	800
Storage-BF-1-2	1.45	800
Storage-BF-1-2	1.50	800
Storage-BF-1-2	1.55	800
Storage-BF-1-2	1.60	800
Storage-BF-1-2	1.65	800
Storage-BF-1-2	1.70	800
Storage-BF-1-2	1.75	800
Storage-BF-1-2	1.80	800
Storage-BF-1-2	1.85	800
Storage-BF-1-2	1.90	800
Storage-BF-1-2	1.95	800
Storage-BF-1-2	2.00	800
Storage-BF-1-2	2.05	800
Storage-BF-1-2	2.10	800
Storage-BF-1-2	2.15	800
Storage-BF-1-2	2.20	800
Storage-BF-1-2	2.25	800
Storage-BF-1-2	2.30	800
Storage-BF-1-2	2.35	800
Storage-BF-1-2	2.40	800
Storage-BF-1-2	2.45	800
Storage-BF-1-2	2.50	800
Storage-BF-1-2	2.55	844
Storage-BF-1-2	2.60	888
Storage-BF-1-2	2.65	932
Storage-BF-1-2	2.70	976
Storage-BF-1-2	2.75	1020
Storage-BF-1-2	2.80	1064
Storage-BF-1-2	2.85	1108
Storage-BF-1-2	2.90	1152
Storage-BF-1-2	2.95	1196
Storage-BF-1-2	3.00	1240

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Storage-BF-1-2             3.05       1284
Storage-BF-1-2             3.10       1328
Storage-BF-1-2             3.15       1372
Storage-BF-1-2             3.20       1416
Storage-BF-1-2             3.25       1460
Storage-BF-1-2             3.30       1504
Storage-BF-1-2             3.35       1548
Storage-BF-1-2             3.40       1592
Storage-BF-1-2             3.45       1636
Storage-BF-1-2             3.50       1680
Storage-BF-1-2             3.55       1682
Storage-BF-1-2             3.60       1684
Storage-BF-1-2             3.65       1685
Storage-BF-1-2             3.70       1687
Storage-BF-1-2             3.75       1689
Storage-BF-1-2             3.80       1691
Storage-BF-1-2             3.85       1692
Storage-BF-1-2             3.90       1694
Storage-BF-1-2             3.95       1696
Storage-BF-1-2             4.00       1698
Storage-BF-1-2             4.05       1699
Storage-BF-1-2             4.10       1701
Storage-BF-1-2             4.15       1703
Storage-BF-1-2             4.20       1705
Storage-BF-1-2             4.25       1706
Storage-BF-1-2             4.30       1708
Storage-BF-1-2             4.35       1710
Storage-BF-1-2             4.40       1712
Storage-BF-1-2             4.45       1713
Storage-BF-1-2             4.50       1715

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Lindbergh
Lindbergh        FILE "LbergRain.dat"

[REPORT]
;;Reporting Options
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 370.141 4295.274 847.527 4772.674
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
POC-2            1030.069           4746.672
DIV1             808.960            4639.766
BF-2             1063.352           4504.332
```

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[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------

[Polygons]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
DMA-2            676.906            4742.221
BF-1-2           744.978            4708.185
BF-1-2           744.978            4708.185
BF-1-2           738.708            4708.185

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
Lindbergh        545.389            4726.910
```

BF-1-2- HMP-2

Discharge vs Elevation Table

Bottom orifice diameter:	0.65 "	Top orifice diameter:	1 "
Number:	1	Number:	7
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	2.00 ft
Middle orifice diameter:	1 "	Emergency weir:	3'X1.916' Type G
number of orif:	4	Invert:	3.00 ft
Cg-middle:	0.61	Area	5.75 sq ft
invert elev:	1.20 ft	Circumference	9.832 ft

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Q emergency (cfs)	Qtot (cfs)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00000
0.55	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00156
0.60	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00305
0.65	2.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00395
0.70	3.69	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00469
0.75	4.62	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00533
0.80	5.54	0.00	0.00	0.00	0.01	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00589
0.85	6.46	0.00	0.00	0.00	0.01	0.19	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00641
0.90	7.38	0.00	0.00	0.00	0.01	0.46	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00689
0.95	8.31	0.00	0.00	0.00	0.01	0.96	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00734
1.00	9.23	0.00	0.00	0.00	0.01	1.82	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00776
1.05	10.15	0.00	0.00	0.00	0.01	3.19	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00816
1.10	11.08	0.00	0.00	0.00	0.01	5.27	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00854
1.15	12.00	0.00	0.00	0.00	0.01	8.30	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00890
1.20	12.92	0.00	0.00	0.00	0.01	12.56	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00925
1.25	13.85	0.60	0.00	0.00	0.01	18.41	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01819
1.30	14.77	1.20	0.00	0.00	0.01	26.25	0.01	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.03571
1.35	15.69	1.80	0.00	0.00	0.01	36.52	0.01	0.04	0.05	0.04	0.00	0.00	0.00	0.00	0.04538
1.40	16.62	2.40	0.00	0.00	0.01	49.77	0.01	0.04	0.06	0.04	0.00	0.00	0.00	0.00	0.05304
1.45	17.54	3.00	0.00	0.00	0.01	66.59	0.01	0.05	0.06	0.05	0.00	0.00	0.00	0.00	0.05958
1.50	18.46	3.60	0.00	0.00	0.01	87.65	0.01	0.05	0.07	0.05	0.00	0.00	0.00	0.00	0.06541
1.55	19.38	4.20	0.00	0.00	0.01	113.71	0.01	0.06	0.12	0.06	0.00	0.00	0.00	0.00	0.07071
1.60	20.31	4.80	0.00	0.00	0.01	145.60	0.01	0.06	0.29	0.06	0.00	0.00	0.00	0.00	0.07561
1.65	21.23	5.40	0.00	0.00	0.01	184.24	0.01	0.07	0.66	0.07	0.00	0.00	0.00	0.00	0.08020
1.70	22.15	6.00	0.00	0.00	0.01	230.66	0.01	0.07	1.38	0.07	0.00	0.00	0.00	0.00	0.08452
1.75	23.08	6.60	0.00	0.00	0.01	285.97	0.01	0.08	2.62	0.08	0.00	0.00	0.00	0.00	0.08862
1.80	24.00	7.20	0.00	0.00	0.01	351.38	0.01	0.08	4.62	0.08	0.00	0.00	0.00	0.00	0.09253
1.85	24.92	7.80	0.00	0.00	0.01	428.21	0.01	0.08	7.66	0.08	0.00	0.00	0.00	0.00	0.09627

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Q emergency (cfs)	Qtot (cfs)
1.90	25.85	8.40	0.00	0.00	0.01	517.89	0.01	0.09	12.11	0.09	0.00	0.00	0.00	0.00	0.09987
1.95	26.77	9.00	0.00	0.00	0.01	621.98	0.01	0.09	18.38	0.09	0.00	0.00	0.00	0.00	0.10334
2.00	27.69	9.60	0.00	0.00	0.01	742.12	0.01	0.09	26.97	0.09	0.00	0.00	0.00	0.00	0.10669
2.05	28.62	10.20	0.60	0.00	0.01	880.12	0.01	0.10	38.46	0.10	0.02	0.02	0.00	0.00	0.12499
2.10	29.54	10.80	1.20	0.00	0.01	1037.89	0.01	0.10	53.51	0.10	0.05	0.05	0.00	0.00	0.15823
2.15	30.46	11.40	1.80	0.00	0.01	1217.47	0.01	0.10	72.88	0.10	0.06	0.08	0.00	0.00	0.17767
2.20	31.38	12.00	2.40	0.00	0.01	1421.05	0.01	0.10	97.42	0.10	0.07	0.10	0.00	0.00	0.19351
2.25	32.31	12.60	3.00	0.00	0.01	1650.95	0.01	0.11	128.10	0.11	0.09	0.10	0.00	0.00	0.20735
2.30	33.23	13.20	3.60	0.00	0.02	1909.64	0.02	0.11	166.00	0.11	0.09	0.12	0.00	0.00	0.21988
2.35	34.15	13.80	4.20	0.00	0.02	2199.75	0.02	0.11	212.29	0.11	0.10	0.21	0.00	0.00	0.23144
2.40	35.08	14.40	4.80	0.00	0.02	2524.04	0.02	0.11	268.30	0.11	0.11	0.50	0.00	0.00	0.24226
2.45	36.00	15.00	5.40	0.00	0.02	2885.45	0.02	0.12	335.47	0.12	0.12	1.15	0.00	0.00	0.25247
2.50	36.92	15.60	6.00	0.00	0.02	3287.07	0.02	0.12	415.37	0.12	0.13	2.41	0.00	0.00	0.26217
2.55	37.85	16.20	6.60	0.00	0.02	3732.17	0.02	0.12	509.71	0.12	0.13	4.58	0.00	0.00	0.27145
2.60	38.77	16.80	7.20	0.00	0.02	4224.18	0.02	0.12	620.37	0.12	0.14	8.08	0.00	0.00	0.28036
2.65	39.69	17.40	7.80	0.00	0.02	4766.71	0.02	0.13	749.37	0.13	0.15	13.41	0.00	0.00	0.28895
2.70	40.62	18.00	8.40	0.00	0.02	5363.55	0.02	0.13	898.86	0.13	0.15	21.20	0.00	0.00	0.29724
2.75	41.54	18.60	9.00	0.00	0.02	6018.68	0.02	0.13	1071.21	0.13	0.16	32.17	0.00	0.00	0.30528
2.80	42.46	19.20	9.60	0.00	0.02	6736.25	0.02	0.13	1268.92	0.13	0.16	47.20	0.00	0.00	0.31308
2.85	43.38	19.80	10.20	0.00	0.02	7520.64	0.02	0.14	1494.68	0.14	0.17	67.30	0.00	0.00	0.32067
2.90	44.31	20.40	10.80	0.00	0.02	8376.39	0.02	0.14	1751.36	0.14	0.17	93.64	0.00	0.00	0.32806
2.95	45.23	21.00	11.40	0.00	0.02	9308.26	0.02	0.14	2042.03	0.14	0.18	127.53	0.00	0.00	0.33527
3.00	46.15	21.60	12.00	0.00	0.02	10321.23	0.02	0.14	2369.93	0.14	0.18	170.49	0.00	0.00	0.34231
3.05	47.08	22.20	12.60	0.10	0.02	11420.46	0.02	0.14	2738.53	0.14	0.19	224.18	0.00	0.21	0.56321
3.10	48.00	22.80	13.20	0.21	0.02	12611.35	0.02	0.15	3151.48	0.15	0.19	290.50	0.00	0.61	0.96124
3.15	48.92	23.40	13.80	0.31	0.02	13899.51	0.02	0.15	3612.67	0.15	0.20	371.51	0.00	1.11	1.47454
3.20	49.85	24.00	14.40	0.42	0.02	15290.78	0.02	0.15	4126.18	0.15	0.20	469.53	0.00	1.71	2.08105
3.25	50.77	24.60	15.00	0.52	0.02	16791.22	0.02	0.15	4696.34	0.15	0.21	587.07	0.00	2.39	2.76801
3.30	51.69	25.20	15.60	0.63	0.02	18407.14	0.02	0.15	5327.71	0.15	0.21	726.89	0.00	3.15	3.52682
3.35	52.62	25.80	16.20	0.73	0.02	20145.06	0.02	0.16	6025.05	0.16	0.21	892.00	0.00	3.96	4.35115
3.40	53.54	26.40	16.80	0.84	0.02	22011.78	0.02	0.16	6793.41	0.16	0.22	1085.65	0.00	4.84	5.23613
3.45	54.46	27.00	17.40	0.94	0.02	24014.31	0.02	0.16	7638.07	0.16	0.22	1311.39	0.00	5.78	6.17782
3.50	55.38	27.60	18.00	1.04	0.02	26159.92	0.02	0.16	8564.55	0.16	0.23	1573.01	0.00	6.77	7.17295
3.55	56.31	28.20	18.60	1.15	0.02	28456.16	0.02	0.16	9578.66	0.16	0.23	1874.62	0.00	7.81	8.21878
3.60	57.23	28.80	19.20	1.25	0.02	30910.81	0.02	0.16	10686.45	0.16	0.23	2220.62	0.00	8.90	9.31295
3.65	58.15	29.40	19.80	1.36	0.02	33531.92	0.02	0.17	11894.25	0.17	0.24	2615.70	0.00	10.03	10.45339
3.70	59.08	30.00	20.40	1.46	0.02	36327.82	0.02	0.17	13208.68	0.17	0.24	3064.89	0.00	11.21	11.63828
3.75	60.00	30.60	21.00	1.57	0.02	39307.10	0.02	0.17	14636.64	0.17	0.24	3573.55	0.00	12.43	12.86601
3.80	60.92	31.20	21.60	1.67	0.02	42478.64	0.02	0.17	16185.32	0.17	0.25	4147.38	0.00	13.70	14.13513
3.85	61.85	31.80	22.20	1.77	0.02	45851.60	0.02	0.17	17862.19	0.17	0.25	4792.42	0.00	15.00	15.44431
3.90	62.77	32.40	22.80	1.88	0.02	49435.40	0.02	0.17	19675.05	0.17	0.25	5515.09	0.00	16.34	16.79236
3.95	63.69	33.00	23.40	1.98	0.02	53239.79	0.02	0.18	21631.99	0.18	0.26	6322.17	0.00	17.72	18.17818
4.00	64.62	33.60	24.00	2.09	0.02	57274.79	0.02	0.18	23741.42	0.18	0.26	7220.82	0.00	19.14	19.60078
4.05	65.54	34.20	24.60	2.19	0.02	61550.71	0.02	0.18	26012.08	0.18	0.26	8218.60	0.00	20.59	21.05921
4.10	66.46	34.80	25.20	2.30	0.02	66078.21	0.02	0.18	28453.02	0.18	0.27	9323.48	0.00	22.08	22.55261
4.15	67.38	35.40	25.80	2.40	0.02	70868.20	0.02	0.18	31073.62	0.18	0.27	10543.84	0.00	23.61	24.08018
4.20	68.31	36.00	26.40	2.51	0.02	75931.93	0.02	0.18	33883.63	0.18	0.27	11888.47	0.00	25.16	25.64117
4.25	69.23	36.60	27.00	2.61	0.02	81280.98	0.02	0.19	36893.12	0.19	0.28	13366.62	0.00	26.75	27.23487
4.30	70.15	37.20	27.60	2.71	0.02	86927.23	0.02	0.19	40112.50	0.19	0.28	14987.97	0.00	28.37	28.86063
4.35	71.08	37.80	28.20	2.82	0.02	92882.89	0.02	0.19	43552.57	0.19	0.28	16762.65	0.00	30.02	30.51782
4.40	72.00	38.40	28.80	2.92	0.02	99160.51	0.02	0.19	47224.46	0.19	0.29	18701.28	0.00	31.71	32.20586
4.45	72.92	39.00	29.40	3.03	0.02	105772.95	0.02	0.19	51139.68	0.19	0.29	20814.94	0.00	33.42	33.92418

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Q emergency (cfs)	Qtot (cfs)
4.50	73.85	39.60	30.00	3.13	0.02	112733.44	0.02	0.19	55310.13	0.19	0.29	23115.20	0.00	34.46	34.96987
4.55	74.77	40.20	30.60	3.24	0.02	120055.54	0.02	0.19	59748.07	0.19	0.30	25614.13	0.00	35.03	35.54411
4.60	75.69	40.80	31.20	3.34	0.02	127753.14	0.02	0.20	64466.15	0.20	0.30	28324.31	0.00	35.59	36.10918
4.65	76.62	41.40	31.80	3.44	0.02	135840.51	0.02	0.20	69477.42	0.20	0.30	31258.83	0.00	36.14	36.66552
4.70	77.54	42.00	32.40	3.55	0.02	144332.27	0.02	0.20	74795.33	0.20	0.30	34431.34	0.00	36.69	37.21352
4.75	78.46	42.60	33.00	3.65	0.02	153243.38	0.02	0.20	80433.73	0.20	0.31	37855.98	0.00	37.22	37.75355
4.80	79.38	43.20	33.60	3.76	0.02	162589.19	0.02	0.20	86406.87	0.20	0.31	41547.49	0.00	37.75	38.28594
4.85	80.31	43.80	34.20	3.86	0.02	172385.40	0.02	0.20	92729.43	0.20	0.31	45521.14	0.00	38.27	38.81101
4.90	81.23	44.40	34.80	3.97	0.02	182648.11	0.02	0.20	99416.51	0.20	0.32	49792.78	0.00	38.79	39.32906
4.95	82.15	45.00	35.40	4.07	0.02	193393.77	0.02	0.21	106483.64	0.21	0.32	54378.84	0.00	39.29	39.84036
5.00	83.08	45.60	36.00	4.18	0.02	204639.22	0.02	0.21	113946.78	0.21	0.32	59296.36	0.00	39.79	40.34516

BF-1-2 /Stage Storage					
HMP-2					
depth	area	area (ac)	elevation	volume (cf)	volume (acft)
0.00	800	0.018	514	0	0
0.05	800	0.018	514.05	40.0	0.000918
0.10	800	0.018	514.1	80.0	0.001837
0.15	800	0.018	514.15	120.0	0.002755
0.20	800	0.018	514.2	160.0	0.003673
0.25	800	0.018	514.25	200.0	0.004591
0.30	800	0.018	514.3	240.0	0.005510
0.35	800	0.018	514.35	280.0	0.006428
0.40	800	0.018	514.4	320.0	0.007346
0.45	800	0.018	514.45	360.0	0.008264
0.50	800	0.018	514.5	400.0	0.009183
0.55	800	0.018	514.55	440.0	0.010101
0.60	800	0.018	514.6	480.0	0.011019
0.65	800	0.018	514.65	520.0	0.011938
0.70	800	0.018	514.7	560.0	0.012856
0.75	800	0.018	514.75	600.0	0.013774
0.80	800	0.018	514.8	640.0	0.014692
0.85	800	0.018	514.85	680.0	0.015611
0.90	800	0.018	514.9	720.0	0.016529
0.95	800	0.018	514.95	760.0	0.017447
1.00	800	0.018	515	800.0	0.018365
1.05	800	0.018	515.05	840.0	0.019284
1.10	800	0.018	515.1	880.0	0.020202
1.15	800	0.018	515.15	920.0	0.021120
1.20	800	0.018	515.2	960.0	0.022039
1.25	800	0.018	515.25	1000.0	0.022957
1.30	800	0.018	515.3	1040.0	0.023875
1.35	800	0.018	515.35	1080.0	0.024793
1.40	800	0.018	515.4	1120.0	0.025712
1.45	800	0.018	515.45	1160.0	0.026630
1.50	800	0.018	515.5	1200.0	0.027548
1.55	800	0.018	515.55	1240.0	0.028466
1.60	800	0.018	515.6	1280.0	0.029385
1.65	800	0.018	515.65	1320.0	0.030303
1.70	800	0.018	515.7	1360.0	0.031221
1.75	800	0.018	515.75	1400.0	0.032140
1.80	800	0.018	515.8	1440.0	0.033058
1.85	800	0.018	515.85	1480.0	0.033976
1.90	800	0.018	515.9	1520.0	0.034894
1.95	800	0.018	515.95	1560.0	0.035813
2.00	800	0.018	516	1600.0	0.036731
2.05	800	0.018	516.05	1640.0	0.037649
2.10	800	0.018	516.1	1680.0	0.038567
2.15	800	0.018	516.15	1720.0	0.039486
2.20	800	0.018	516.2	1760.0	0.040404
2.25	800	0.018	516.25	1800.0	0.041322
2.30	800	0.018	516.3	1840.0	0.042241
2.35	800	0.018	516.35	1880.0	0.043159
2.40	800	0.018	516.4	1920.0	0.044077
2.45	800	0.018	516.45	1960.0	0.044995
2.50	800	0.018	516.5	2000.0	0.045914
2.55	800	0.018	516.55	2040.0	0.046832
2.60	800	0.018	516.6	2080.0	0.047750
2.65	800	0.018	516.65	2120.0	0.048669
2.70	800	0.018	516.7	2160.0	0.049587
2.75	800	0.018	516.75	2200.0	0.050505
2.80	800	0.018	516.8	2240.0	0.051423
2.85	800	0.018	516.85	2280.0	0.052342
2.90	800	0.018	516.9	2320.0	0.053260
2.95	800	0.018	516.95	2360.0	0.054178
3.00	800	0.018	517.0	2400.0	0.055096
3.05	844	0.019	517.0	2441.1	0.056040
3.10	888	0.020	517.1	2484.4	0.057034
3.15	932	0.021	517.1	2529.9	0.058079
3.20	976	0.022	517.2	2577.6	0.059174

depth	area	area (ac)	elevation	volume (cf)	volume (acft)
3.25	1020	0.023	517.2	2627.5	0.060319
3.30	1064	0.024	517.3	2679.6	0.061515
3.35	1108	0.025	517.3	2733.9	0.062762
3.40	1152	0.026	517.4	2790.4	0.064059
3.45	1196	0.027	517.4	2849.1	0.065406
3.50	1240	0.028	517.5	2910.0	0.066804
3.55	1284	0.029	517.5	2973.1	0.068253
3.60	1328	0.030	517.6	3038.4	0.069752
3.65	1372	0.031	517.6	3105.9	0.071302
3.70	1416	0.033	517.7	3175.6	0.072902
3.75	1460	0.034	517.7	3247.5	0.074552
3.80	1504	0.035	517.8	3321.6	0.076253
3.85	1548	0.036	517.8	3397.9	0.078005
3.90	1592	0.037	517.9	3476.4	0.079807
3.95	1636	0.038	517.9	3557.1	0.081660
4.00	1680	0.039	518.0	3640.0	0.083563
4.05	1682	0.039	518.0	3724.0	0.085492
4.10	1684	0.039	518.1	3808.2	0.087424
4.15	1685	0.039	518.1	3892.4	0.089357
4.20	1687	0.039	518.2	3976.7	0.091292
4.25	1689	0.039	518.2	4061.1	0.093230
4.30	1691	0.039	518.3	4145.6	0.095169
4.35	1692	0.039	518.3	4230.1	0.097111
4.40	1694	0.039	518.4	4314.8	0.099054
4.45	1696	0.039	518.4	4399.5	0.101000
4.50	1698	0.039	518.5	4484.4	0.102947
4.55	1699	0.039	518.5	4569.3	0.104897
4.60	1701	0.039	518.6	4654.3	0.106848
4.65	1703	0.039	518.6	4739.4	0.108802
4.70	1705	0.039	518.7	4824.6	0.110757
4.75	1706	0.039	518.7	4909.8	0.112715
4.80	1708	0.039	518.8	4995.2	0.114674
4.85	1710	0.039	518.8	5080.6	0.116636
4.90	1712	0.039	518.9	5166.2	0.118599
4.95	1713	0.039	518.9	5251.8	0.120565
5.00	1715	0.039	519.0	5337.5	0.122532

BF-1-2		$Q_{Sub\ Drain}$=	0.006	cfs
Elevation	Q_{AVG} (CFS)	DV (CF)	DT (HR)	Total T
0.00	0.006	40.0	1.852	36.16
0.05	0.006	40.0	1.852	34.31
0.10	0.006	40.0	1.852	32.46
0.15	0.006	40.0	1.852	30.61
0.20	0.006	40.0	1.852	28.75
0.25	0.006	40.0	1.852	26.90
0.30	0.006	40.0	1.852	25.05
0.35	0.006	40.0	1.852	23.20
0.40	0.006	40.0	1.852	21.35
0.45	0.006	40.0	1.852	19.50
0.50	0.006	40.0	1.639	17.64
0.55	0.008	40.0	1.339	16.00
0.60	0.009	40.0	1.170	14.67
0.65	0.010	40.0	1.076	13.50
0.70	0.011	40.0	1.009	12.42
0.75	0.011	40.0	0.957	11.41
0.80	0.012	40.0	0.914	10.45
0.85	0.012	40.0	0.878	9.54
0.90	0.013	40.0	0.847	8.66
0.95	0.013	40.0	0.820	7.81
1.00	0.014	40.0	0.796	6.99
1.05	0.014	40.0	0.774	6.20
1.10	0.015	40.0	0.755	5.42
1.15	0.015	40.0	0.737	4.67
1.20	0.015	40.0	0.563	3.93
1.25	0.024	40.0	0.337	3.37
1.30	0.042	40.0	0.239	3.03
1.35	0.051	40.0	0.201	2.79
1.40	0.059	40.0	0.178	2.59
1.45	0.066	40.0	0.162	2.41
1.50	0.071	40.0	0.150	2.25
1.55	0.077	40.0	0.140	2.10
1.60	0.082	40.0	0.132	1.96
1.65	0.086	40.0	0.126	1.83
1.70	0.091	40.0	0.120	1.70
1.75	0.095	40.0	0.115	1.58
1.80	0.099	40.0	0.111	1.47
1.85	0.102	40.0	0.107	1.36
1.90	0.106	40.0	0.103	1.25
1.95	0.109	40.0	0.100	1.15
2.00	0.113	40.0	0.091	1.05
2.05	0.131	40.0	0.075	0.95
2.10	0.164	40.0	0.064	0.88
2.15	0.184	40.0	0.058	0.81
2.20	0.200	40.0	0.054	0.76
2.25	0.213	40.0	0.051	0.70
2.30	0.226	40.0	0.048	0.65
2.35	0.237	40.0	0.046	0.60
2.40	0.248	40.0	0.044	0.56
2.45	0.258	40.0	0.042	0.51
2.50	0.268	40.0	0.041	0.47
2.55	0.277	40.0	0.039	0.43
2.60	0.286	40.0	0.038	0.39
2.65	0.295	40.0	0.037	0.35
2.70	0.303	40.0	0.036	0.32
2.75	0.311	40.0	0.035	0.28
2.80	0.319	40.0	0.034	0.25
2.85	0.327	40.0	0.034	0.21
2.90	0.334	40.0	0.033	0.18
2.95	0.341	40.0	0.032	0.14
3.00	0.348	41.1	0.025	0.11
3.05	0.569	43.3	0.016	0.09
3.10	0.967	45.5	0.010	0.07
3.15	1.481	47.7	0.007	0.06
3.20	2.087	49.9	0.006	0.05

BF-1-2		$Q_{Sub\ Drain}$=	0.006	cfs
Elevation	Q_{AVG} (CFS)	DV (CF)	DT (HR)	Total T
3.25	2.774	52.1	0.005	0.05
3.30	3.533	54.3	0.004	0.04
3.35	4.357	56.5	0.003	0.04
3.40	5.242	58.7	0.003	0.04
3.45	6.184	60.9	0.003	0.03
3.50	7.179	63.1	0.002	0.03
3.55	8.225	65.3	0.002	0.03
3.60	9.319	67.5	0.002	0.03
3.65	10.459	69.7	0.002	0.03
3.70	11.644	71.9	0.002	0.02
3.75	12.872	74.1	0.002	0.02
3.80	14.141	76.3	0.001	0.02
3.85	15.450	78.5	0.001	0.02
3.90	16.798	80.7	0.001	0.02
3.95	18.184	82.9	0.001	0.02
4.00	19.607	84.0	0.001	0.02
4.05	21.065	84.1	0.001	0.01
4.10	22.559	84.2	0.001	0.01
4.15	24.086	84.3	0.001	0.01
4.20	25.647	84.4	0.001	0.01
4.25	27.241	84.5	0.001	0.01
4.30	28.867	84.6	0.001	0.01
4.35	30.524	84.7	0.001	0.01
4.40	32.212	84.7	0.001	0.01
4.45	33.930	84.8	0.001	0.01
4.50	34.976	84.9	0.001	0.01
4.55	35.550	85.0	0.001	0.01
4.60	36.115	85.1	0.001	0.00
4.65	36.672	85.2	0.001	0.00
4.70	37.220	85.3	0.001	0.00
4.75	37.760	85.4	0.001	0.00
4.80	38.292	85.4	0.001	0.00
4.85	38.817	85.5	0.001	0.00
4.90	39.335	85.6	0.001	0.00
4.95	39.846	85.7	0.001	0.00
5.00	40.351			

Table G.1-1 Monthly Average Reference Evapotranspiration by ETo Zone
(inches/month and inches/day)for use in SWMM Models for Hydromodification Management Studies in San Diego County
CIMIS Zones 1, 4, 6, 9, and 16 (See CIMIS ETo Zone Map)

		CIMIS Reference Evapotranspiration (ETo) by Zone									
		Zone 1		Zone 4		Zone 6		Zone 9		Zone 16	
	Days Per Month	in/month	in/day	in/month	in/day	in/month	in/day	in/month	in/day	in/month	in/day
January	31	0.93	0.03	1.86	0.06	1.86	0.06	2.17	0.07	1.55	0.05
February	28	1.4	0.05	2.24	0.08	2.24	0.08	2.8	0.1	2.52	0.09
March	31	2.48	0.08	3.41	0.11	3.41	0.11	4.03	0.13	4.03	0.13
April	30	3.3	0.11	4.5	0.15	4.8	0.16	5.1	0.17	5.7	0.19
May	31	4.03	0.13	5.27	0.17	5.58	0.18	5.89	0.19	7.75	0.25
June	30	4.5	0.15	5.7	0.19	6.3	0.21	6.6	0.22	8.7	0.29
July	31	4.65	0.15	5.89	0.19	6.51	0.21	7.44	0.24	9.3	0.3
August	31	4.03	0.13	5.58	0.18	6.2	0.2	6.82	0.22	8.37	0.27
September	30	3.3	0.11	4.5	0.15	4.8	0.16	5.7	0.19	6.3	0.21
October	31	2.48	0.08	3.41	0.11	3.72	0.12	4.03	0.13	4.34	0.14
November	30	1.2	0.04	2.4	0.08	2.4	0.08	2.7	0.09	2.4	0.08
December	31	0.62	0.02	1.86	0.06	1.86	0.06	1.86	0.06	1.55	0.05

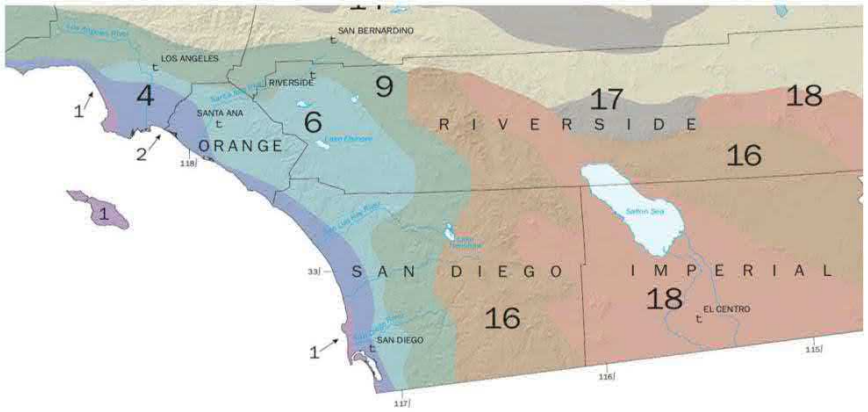
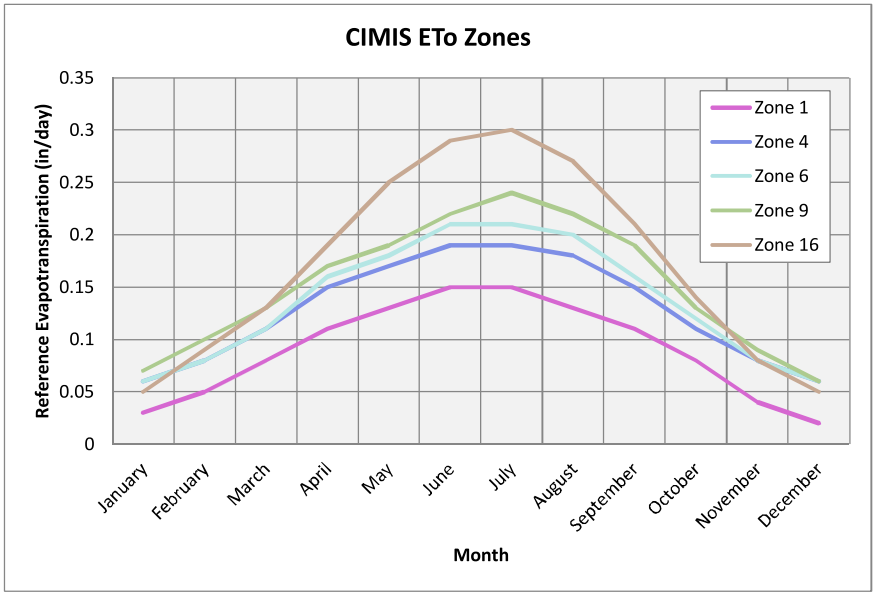


FIGURE G.1-2 California Irrigation Management Information System (CIMIS) "Reference Evapotranspiration Zones" brochure and map



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)

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NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
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Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date 10/17/1948 08:00:00
Ending Date 12/31/2005 23:00:00
Antecedent Dry Days 0.0
Report Time Step 01:00:00
Wet Time Step 00:15:00
Dry Time Step 01:00:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	641.368	563.840
Evaporation Loss	19.159	16.843
Infiltration Loss	515.649	453.318
Surface Runoff	110.696	97.315
Final Storage	0.000	0.000
Continuity Error (%)	-0.645	

Flow Routing Continuity	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	110.696	36.072
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000

External Inflow	0.000	0.000
External Outflow	110.696	36.072
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
DMA-1	563.84	0.00	16.89	453.94	96.54	33.40	16.04	0.171
DMA-2	563.84	0.00	16.11	444.64	108.19	2.67	1.19	0.192

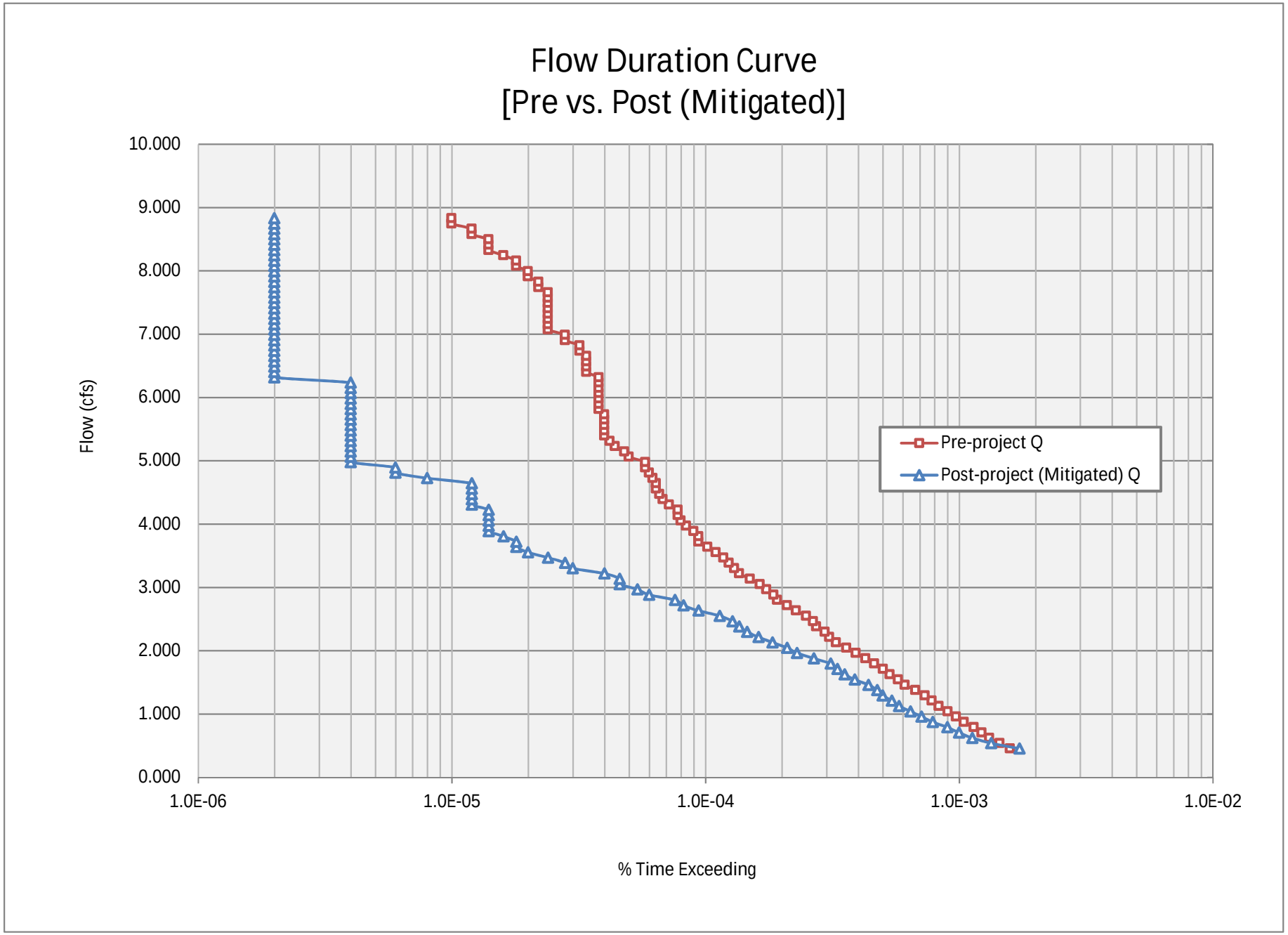
Analysis begun on: Tue Jun 01 14:56:33 2021
Analysis ended on: Tue Jun 01 14:57:13 2021
Total elapsed time: 00:00:40

Low-flow Threshold:	10%	
0.1xQ2 (Pre):	0.456	cfs
Q10 (Pre):	8.831	cfs
Ordinate #:	100	
Incremental Q (Pre):	0.08375	cfs
Total Hourly Data:	501471	hours

The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	0.456	794	1.58E-03	865	1.72E-03	109%	Pass
1	0.539	724	1.44E-03	670	1.34E-03	93%	Pass
2	0.623	658	1.31E-03	564	1.12E-03	86%	Pass
3	0.707	615	1.23E-03	500	9.97E-04	81%	Pass
4	0.791	572	1.14E-03	450	8.97E-04	79%	Pass
5	0.874	523	1.04E-03	394	7.86E-04	75%	Pass
6	0.958	487	9.71E-04	356	7.10E-04	73%	Pass
7	1.042	452	9.01E-04	322	6.42E-04	71%	Pass
8	1.126	416	8.30E-04	290	5.78E-04	70%	Pass
9	1.209	391	7.80E-04	272	5.42E-04	70%	Pass
10	1.293	367	7.32E-04	250	4.99E-04	68%	Pass
11	1.377	337	6.72E-04	238	4.75E-04	71%	Pass
12	1.461	306	6.10E-04	220	4.39E-04	72%	Pass
13	1.544	288	5.74E-04	194	3.87E-04	67%	Pass
14	1.628	267	5.32E-04	177	3.53E-04	66%	Pass
15	1.712	251	5.01E-04	166	3.31E-04	66%	Pass
16	1.796	232	4.63E-04	156	3.11E-04	67%	Pass
17	1.879	214	4.27E-04	134	2.67E-04	63%	Pass
18	1.963	196	3.91E-04	115	2.29E-04	59%	Pass
19	2.047	180	3.59E-04	105	2.09E-04	58%	Pass
20	2.131	164	3.27E-04	92	1.83E-04	56%	Pass
21	2.214	154	3.07E-04	81	1.62E-04	53%	Pass
22	2.298	148	2.95E-04	73	1.46E-04	49%	Pass
23	2.382	137	2.73E-04	68	1.36E-04	50%	Pass
24	2.466	133	2.65E-04	64	1.28E-04	48%	Pass
25	2.549	125	2.49E-04	57	1.14E-04	46%	Pass
26	2.633	114	2.27E-04	47	9.37E-05	41%	Pass
27	2.717	105	2.09E-04	41	8.18E-05	39%	Pass
28	2.801	96	1.91E-04	38	7.58E-05	40%	Pass
29	2.884	93	1.85E-04	30	5.98E-05	32%	Pass
30	2.968	87	1.73E-04	27	5.38E-05	31%	Pass
31	3.052	82	1.64E-04	23	4.59E-05	28%	Pass
32	3.136	75	1.50E-04	23	4.59E-05	31%	Pass
33	3.219	68	1.36E-04	20	3.99E-05	29%	Pass
34	3.303	65	1.30E-04	15	2.99E-05	23%	Pass
35	3.387	62	1.24E-04	14	2.79E-05	23%	Pass
36	3.471	59	1.18E-04	12	2.39E-05	20%	Pass
37	3.554	55	1.10E-04	10	1.99E-05	18%	Pass
38	3.638	51	1.02E-04	9	1.79E-05	18%	Pass
39	3.722	47	9.37E-05	9	1.79E-05	19%	Pass
40	3.806	47	9.37E-05	8	1.60E-05	17%	Pass
41	3.889	45	8.97E-05	7	1.40E-05	16%	Pass
42	3.973	42	8.38E-05	7	1.40E-05	17%	Pass
43	4.057	40	7.98E-05	7	1.40E-05	18%	Pass
44	4.141	39	7.78E-05	7	1.40E-05	18%	Pass
45	4.224	39	7.78E-05	7	1.40E-05	18%	Pass
46	4.308	36	7.18E-05	6	1.20E-05	17%	Pass
47	4.392	34	6.78E-05	6	1.20E-05	18%	Pass
48	4.476	33	6.58E-05	6	1.20E-05	18%	Pass
49	4.559	32	6.38E-05	6	1.20E-05	19%	Pass
50	4.643	32	6.38E-05	6	1.20E-05	19%	Pass
51	4.727	31	6.18E-05	4	7.98E-06	13%	Pass
52	4.811	30	5.98E-05	3	5.98E-06	10%	Pass
53	4.894	29	5.78E-05	3	5.98E-06	10%	Pass
54	4.978	29	5.78E-05	2	3.99E-06	7%	Pass

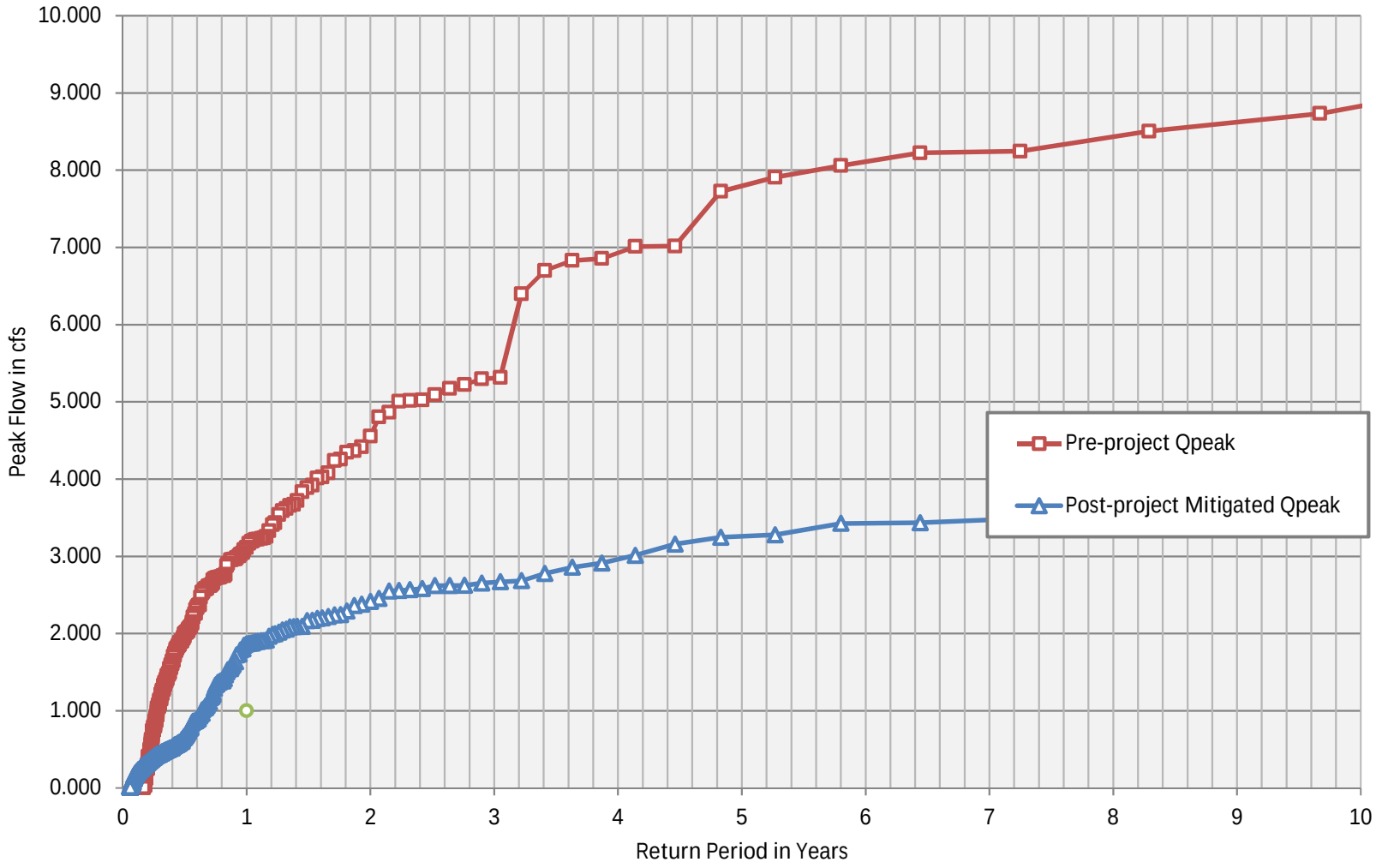
Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
55	5.062	25	4.99E-05	2	3.99E-06	8%	Pass
56	5.146	24	4.79E-05	2	3.99E-06	8%	Pass
57	5.229	22	4.39E-05	2	3.99E-06	9%	Pass
58	5.313	21	4.19E-05	2	3.99E-06	10%	Pass
59	5.397	20	3.99E-05	2	3.99E-06	10%	Pass
60	5.481	20	3.99E-05	2	3.99E-06	10%	Pass
61	5.564	20	3.99E-05	2	3.99E-06	10%	Pass
62	5.648	20	3.99E-05	2	3.99E-06	10%	Pass
63	5.732	20	3.99E-05	2	3.99E-06	10%	Pass
64	5.816	19	3.79E-05	2	3.99E-06	11%	Pass
65	5.899	19	3.79E-05	2	3.99E-06	11%	Pass
66	5.983	19	3.79E-05	2	3.99E-06	11%	Pass
67	6.067	19	3.79E-05	2	3.99E-06	11%	Pass
68	6.151	19	3.79E-05	2	3.99E-06	11%	Pass
69	6.234	19	3.79E-05	2	3.99E-06	11%	Pass
70	6.318	19	3.79E-05	1	1.99E-06	5%	Pass
71	6.402	17	3.39E-05	1	1.99E-06	6%	Pass
72	6.486	17	3.39E-05	1	1.99E-06	6%	Pass
73	6.569	17	3.39E-05	1	1.99E-06	6%	Pass
74	6.653	17	3.39E-05	1	1.99E-06	6%	Pass
75	6.737	16	3.19E-05	1	1.99E-06	6%	Pass
76	6.821	16	3.19E-05	1	1.99E-06	6%	Pass
77	6.904	14	2.79E-05	1	1.99E-06	7%	Pass
78	6.988	14	2.79E-05	1	1.99E-06	7%	Pass
79	7.072	12	2.39E-05	1	1.99E-06	8%	Pass
80	7.156	12	2.39E-05	1	1.99E-06	8%	Pass
81	7.239	12	2.39E-05	1	1.99E-06	8%	Pass
82	7.323	12	2.39E-05	1	1.99E-06	8%	Pass
83	7.407	12	2.39E-05	1	1.99E-06	8%	Pass
84	7.491	12	2.39E-05	1	1.99E-06	8%	Pass
85	7.574	12	2.39E-05	1	1.99E-06	8%	Pass
86	7.658	12	2.39E-05	1	1.99E-06	8%	Pass
87	7.742	11	2.19E-05	1	1.99E-06	9%	Pass
88	7.826	11	2.19E-05	1	1.99E-06	9%	Pass
89	7.909	10	1.99E-05	1	1.99E-06	10%	Pass
90	7.993	10	1.99E-05	1	1.99E-06	10%	Pass
91	8.077	9	1.79E-05	1	1.99E-06	11%	Pass
92	8.161	9	1.79E-05	1	1.99E-06	11%	Pass
93	8.244	8	1.60E-05	1	1.99E-06	13%	Pass
94	8.328	7	1.40E-05	1	1.99E-06	14%	Pass
95	8.412	7	1.40E-05	1	1.99E-06	14%	Pass
96	8.496	7	1.40E-05	1	1.99E-06	14%	Pass
97	8.579	6	1.20E-05	1	1.99E-06	17%	Pass
98	8.663	6	1.20E-05	1	1.99E-06	17%	Pass
99	8.747	5	9.97E-06	1	1.99E-06	20%	Pass
100	8.831	5	9.97E-06	1	1.99E-06	20%	Pass


Flow Duration Curve
[Pre vs. Post (Mitigated)]
10.000
9.000
8.000
7.000
6.000
5.000
4.000
3.000
2.000
1.000
0.000
Flow (cfs)
1.0E-06
1.0E-05
1.0E-04
1.0E-03
1.0E-02
% Time Exceeding
Pre-project Q
Post-project (Mitigated) Q

Peak Flow Frequency Summary

Return Period	Pre-project Qpeak (cfs)	Post-project - Mitigated Q (cfs)	Post-project - Mitigated Reduction Q (cfs)
LF = 0.1xQ2	0.016	0.010	0.005
2-year	0.156	0.104	0.052
5-year	0.230	0.153	0.077
10-year	0.413	0.233	0.180

Peak Flow Frequency Curves - POC-1



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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.014)
--------------------------------------------------------------

WARNING 04: minimum elevation drop used for Conduit UN-1
WARNING 04: minimum elevation drop used for Conduit Bypass

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

***************
Analysis Options
***************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ 10/17/1948 08:00:00
Ending Date .............. 12/31/2005 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 01:00:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 60.00 sec


*************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
*************************     ---------       -------
Initial LID Storage ......         0.004         0.070
Total Precipitation ......        29.649       563.840
Evaporation Loss .........         4.728        89.911
Infiltration Loss ........        13.493       256.606
Surface Runoff ...........        11.785       224.113
LID Drainage .............         0.088         1.676
Final Storage ............         0.005         0.098
Continuity Error (%) .....        -1.506


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......        11.873         3.869
Groundwater Inflow .......         0.000         0.000
```

RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	11.692	3.810
Flooding Loss	0.000	0.000
Evaporation Loss	0.176	0.057
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.042	

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	60.00 sec
Average Time Step	:	60.00 sec
Maximum Time Step	:	60.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Imperv Runoff in	Perv Runoff in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
DMA-2	563.84	0.00	80.75	137.43	309.74	41.23	350.97	5.53	0.78	0.622
BF-1-2	563.84	3991.46	194.07	1611.95	0.00	2772.85	2793.58	3.87	0.82	0.613

****
LID Performance Summary
****

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Initial Storage in	Final Storage in	Continuity Error %
BF-1-2	BF-1-2	563.84	506.10	0.00	0.00	57.59	2.40	2.55	-0.00

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
POC-2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
DIV1	DIVIDER	0.00	0.00	0.00	0 00:00	0.00
BF-2	STORAGE	0.01	2.58	2.58	6263 01:17	2.22

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
POC-2	OUTFALL	0.00	0.79	6263 01:17	0	3.81	0.000
DIV1	DIVIDER	0.82	0.82	6263 01:01	3.87	3.87	0.000
BF-2	STORAGE	0.00	0.82	6263 01:01	0	3.32	0.048

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
BF-2	0.007	0	2	0	2.065	42	6263 01:16	0.78

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
POC-2	3.46	0.01	0.79	3.810

System	3.46	0.01	0.79	3.810

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
UN-1	DUMMY	0.01	0	20:50			
Bypass	DUMMY	0.82	6263	01:01			
Outlet-BF-1-2	DUMMY	0.78	6263	01:17			

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Fri Sep 24 17:33:11 2021
Analysis ended on: Fri Sep 24 17:33:41 2021
Total elapsed time: 00:00:30

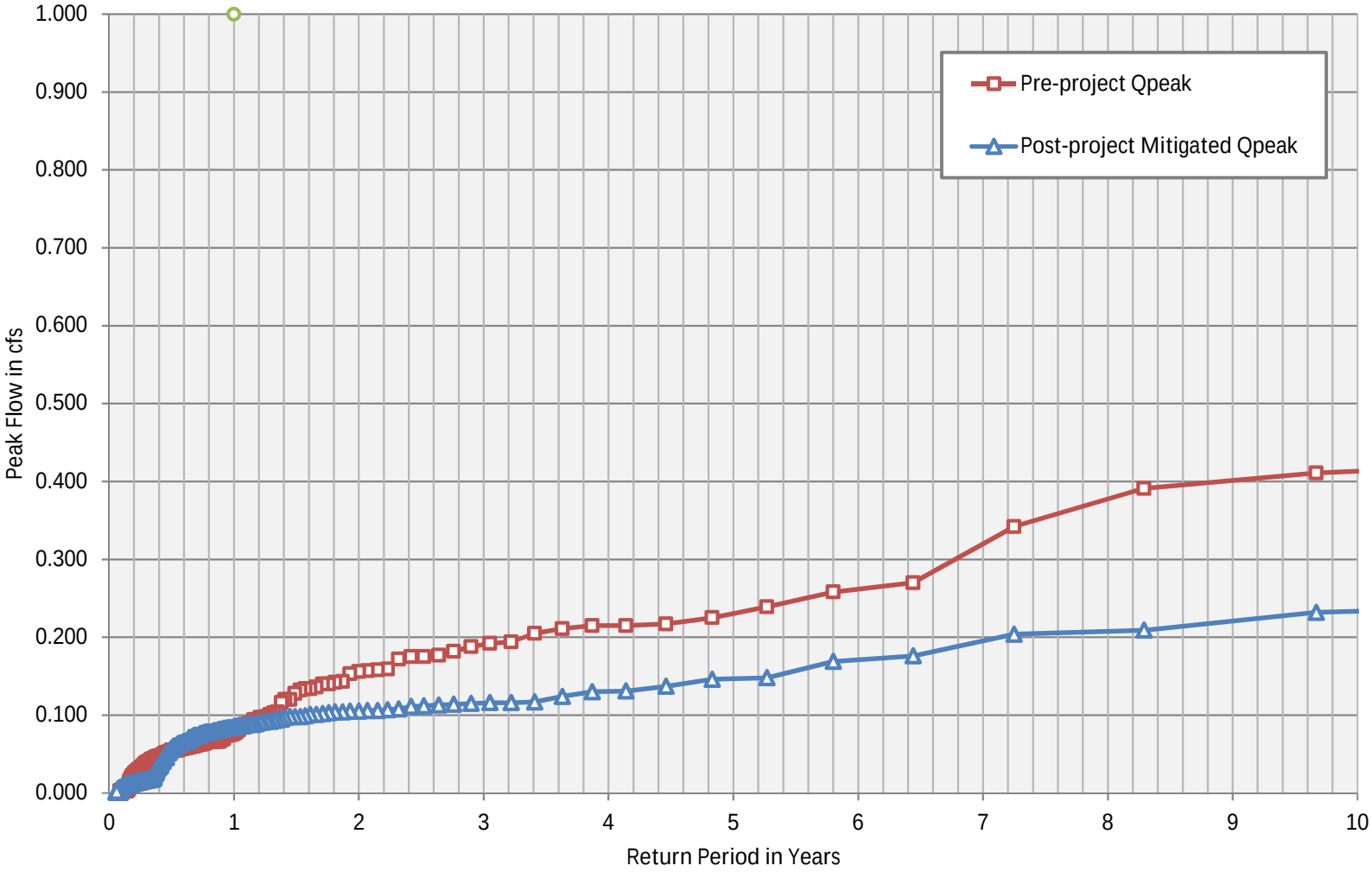
Low-flow Threshold:	10%	
0.1xQ2 (Pre):	0.016	cfs
Q10 (Pre):	0.413	cfs
Ordinate #:	100	
Incremental Q (Pre):	0.00398	cfs
Total Hourly Data:	501471	hours

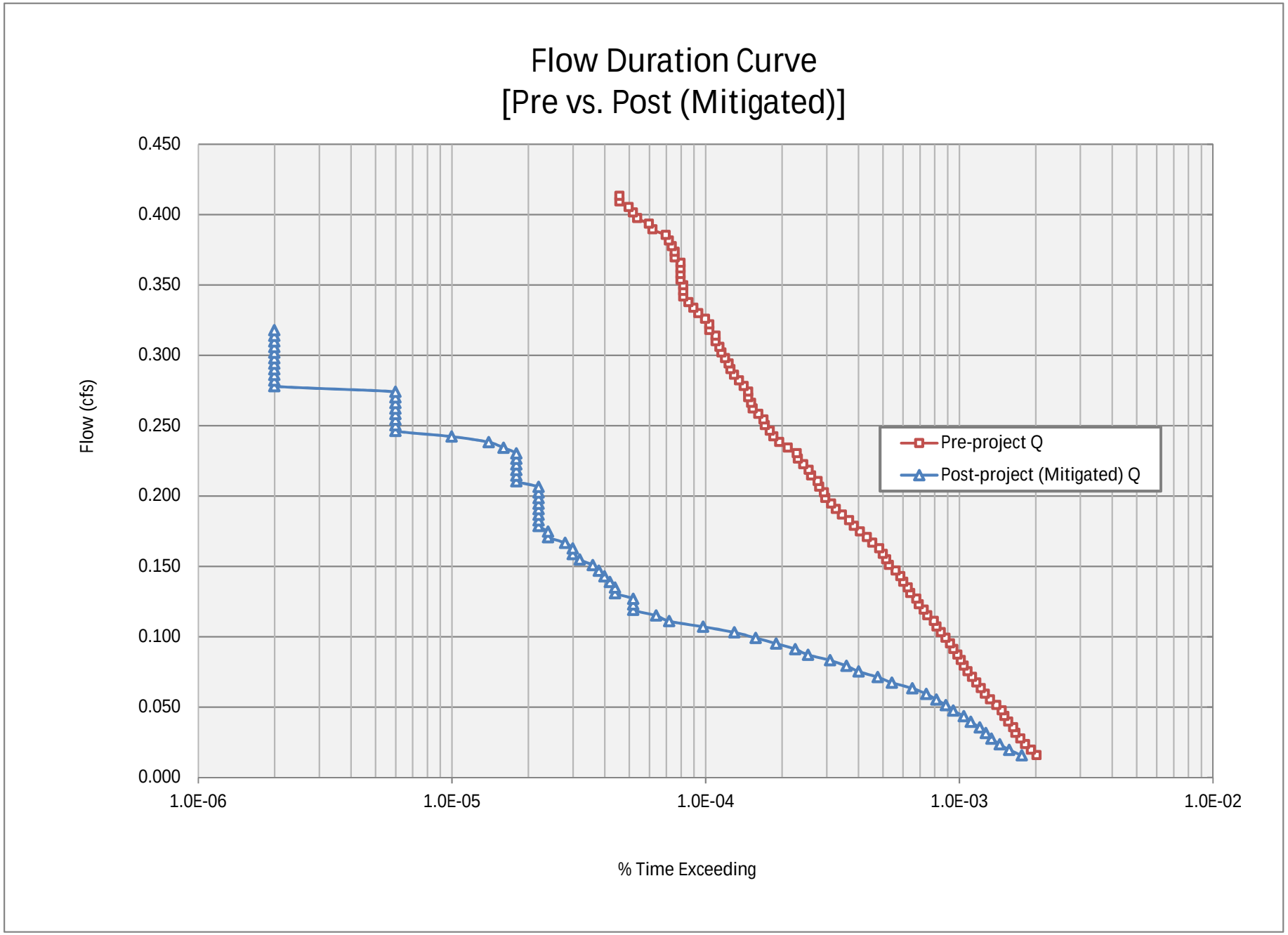
The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	0.016	1013	2.02E-03	884	1.76E-03	87%	Pass
1	0.020	963	1.92E-03	788	1.57E-03	82%	Pass
2	0.024	913	1.82E-03	724	1.44E-03	79%	Pass
3	0.028	874	1.74E-03	671	1.34E-03	77%	Pass
4	0.032	836	1.67E-03	638	1.27E-03	76%	Pass
5	0.035	819	1.63E-03	603	1.20E-03	74%	Pass
6	0.039	784	1.56E-03	556	1.11E-03	71%	Pass
7	0.043	757	1.51E-03	522	1.04E-03	69%	Pass
8	0.047	738	1.47E-03	474	9.45E-04	64%	Pass
9	0.051	703	1.40E-03	443	8.83E-04	63%	Pass
10	0.055	664	1.32E-03	407	8.12E-04	61%	Pass
11	0.059	633	1.26E-03	371	7.40E-04	59%	Pass
12	0.063	611	1.22E-03	327	6.52E-04	54%	Pass
13	0.067	586	1.17E-03	272	5.42E-04	46%	Pass
14	0.071	564	1.12E-03	239	4.77E-04	42%	Pass
15	0.075	541	1.08E-03	201	4.01E-04	37%	Pass
16	0.079	523	1.04E-03	180	3.59E-04	34%	Pass
17	0.083	509	1.02E-03	155	3.09E-04	30%	Pass
18	0.087	494	9.85E-04	127	2.53E-04	26%	Pass
19	0.091	476	9.49E-04	113	2.25E-04	24%	Pass
20	0.095	462	9.21E-04	95	1.89E-04	21%	Pass
21	0.099	443	8.83E-04	79	1.58E-04	18%	Pass
22	0.103	425	8.48E-04	65	1.30E-04	15%	Pass
23	0.107	409	8.16E-04	49	9.77E-05	12%	Pass
24	0.111	399	7.96E-04	36	7.18E-05	9%	Pass
25	0.115	376	7.50E-04	32	6.38E-05	9%	Pass
26	0.119	364	7.26E-04	26	5.18E-05	7%	Pass
27	0.123	348	6.94E-04	26	5.18E-05	7%	Pass
28	0.127	340	6.78E-04	26	5.18E-05	8%	Pass
29	0.131	322	6.42E-04	22	4.39E-05	7%	Pass
30	0.135	315	6.28E-04	22	4.39E-05	7%	Pass
31	0.139	302	6.02E-04	21	4.19E-05	7%	Pass
32	0.143	294	5.86E-04	20	3.99E-05	7%	Pass
33	0.147	282	5.62E-04	19	3.79E-05	7%	Pass
34	0.151	265	5.28E-04	18	3.59E-05	7%	Pass
35	0.155	259	5.16E-04	16	3.19E-05	6%	Pass
36	0.159	251	5.01E-04	15	2.99E-05	6%	Pass
37	0.163	243	4.85E-04	15	2.99E-05	6%	Pass
38	0.167	228	4.55E-04	14	2.79E-05	6%	Pass
39	0.171	217	4.33E-04	12	2.39E-05	6%	Pass
40	0.175	204	4.07E-04	12	2.39E-05	6%	Pass
41	0.179	193	3.85E-04	11	2.19E-05	6%	Pass
42	0.183	185	3.69E-04	11	2.19E-05	6%	Pass
43	0.187	173	3.45E-04	11	2.19E-05	6%	Pass
44	0.191	164	3.27E-04	11	2.19E-05	7%	Pass
45	0.195	157	3.13E-04	11	2.19E-05	7%	Pass
46	0.199	149	2.97E-04	11	2.19E-05	7%	Pass
47	0.202	147	2.93E-04	11	2.19E-05	7%	Pass
48	0.206	141	2.81E-04	11	2.19E-05	8%	Pass
49	0.210	139	2.77E-04	9	1.79E-05	6%	Pass
50	0.214	131	2.61E-04	9	1.79E-05	7%	Pass

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
51	0.218	128	2.55E-04	9	1.79E-05	7%	Pass
52	0.222	122	2.43E-04	9	1.79E-05	7%	Pass
53	0.226	116	2.31E-04	9	1.79E-05	8%	Pass
54	0.230	115	2.29E-04	9	1.79E-05	8%	Pass
55	0.234	106	2.11E-04	8	1.60E-05	8%	Pass
56	0.238	98	1.95E-04	7	1.40E-05	7%	Pass
57	0.242	93	1.85E-04	5	9.97E-06	5%	Pass
58	0.246	90	1.79E-04	3	5.98E-06	3%	Pass
59	0.250	86	1.71E-04	3	5.98E-06	3%	Pass
60	0.254	85	1.70E-04	3	5.98E-06	4%	Pass
61	0.258	81	1.62E-04	3	5.98E-06	4%	Pass
62	0.262	77	1.54E-04	3	5.98E-06	4%	Pass
63	0.266	76	1.52E-04	3	5.98E-06	4%	Pass
64	0.270	74	1.48E-04	3	5.98E-06	4%	Pass
65	0.274	74	1.48E-04	3	5.98E-06	4%	Pass
66	0.278	71	1.42E-04	1	1.99E-06	1%	Pass
67	0.282	68	1.36E-04	1	1.99E-06	1%	Pass
68	0.286	65	1.30E-04	1	1.99E-06	2%	Pass
69	0.290	63	1.26E-04	1	1.99E-06	2%	Pass
70	0.294	62	1.24E-04	1	1.99E-06	2%	Pass
71	0.298	60	1.20E-04	1	1.99E-06	2%	Pass
72	0.302	58	1.16E-04	1	1.99E-06	2%	Pass
73	0.306	57	1.14E-04	1	1.99E-06	2%	Pass
74	0.310	55	1.10E-04	1	1.99E-06	2%	Pass
75	0.314	55	1.10E-04	1	1.99E-06	2%	Pass
76	0.318	52	1.04E-04	1	1.99E-06	2%	Pass
77	0.322	52	1.04E-04	0	0.00E+00	0%	Pass
78	0.326	50	9.97E-05	0	0.00E+00	0%	Pass
79	0.330	47	9.37E-05	0	0.00E+00	0%	Pass
80	0.334	45	8.97E-05	0	0.00E+00	0%	Pass
81	0.338	43	8.57E-05	0	0.00E+00	0%	Pass
82	0.342	41	8.18E-05	0	0.00E+00	0%	Pass
83	0.346	41	8.18E-05	0	0.00E+00	0%	Pass
84	0.350	41	8.18E-05	0	0.00E+00	0%	Pass
85	0.354	40	7.98E-05	0	0.00E+00	0%	Pass
86	0.358	40	7.98E-05	0	0.00E+00	0%	Pass
87	0.362	40	7.98E-05	0	0.00E+00	0%	Pass
88	0.366	40	7.98E-05	0	0.00E+00	0%	Pass
89	0.369	38	7.58E-05	0	0.00E+00	0%	Pass
90	0.373	38	7.58E-05	0	0.00E+00	0%	Pass
91	0.377	37	7.38E-05	0	0.00E+00	0%	Pass
92	0.381	36	7.18E-05	0	0.00E+00	0%	Pass
93	0.385	35	6.98E-05	0	0.00E+00	0%	Pass
94	0.389	31	6.18E-05	0	0.00E+00	0%	Pass
95	0.393	30	5.98E-05	0	0.00E+00	0%	Pass
96	0.397	27	5.38E-05	0	0.00E+00	0%	Pass
97	0.401	26	5.18E-05	0	0.00E+00	0%	Pass
98	0.405	25	4.99E-05	0	0.00E+00	0%	Pass
99	0.409	23	4.59E-05	0	0.00E+00	0%	Pass
100	0.413	23	4.59E-05	0	0.00E+00	0%	Pass

Peak Flow Frequency Curves




Flow Duration Curve
[Pre vs. Post (Mitigated)]
Flow (cfs)
0.450
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
1.0E-06
1.0E-05
1.0E-04
1.0E-03
1.0E-02
% Time Exceeding
Pre-project Q
Post-project (Mitigated) Q

SWMM Model Flow Coefficient Calculation

PARAMETER	ABBREV.	Bio-Retention Cell LID BMP	
Ponding Depth	PD	6	in
Bioretention Soil Layer	S	24	in
Gravel Layer	G	12	in
TOTAL		3.5	ft
		42	in
Orifice Coefficient	c_g	0.6	--
Low Flow Orifice Diameter	D	0.35	in
Drain exponent	n	0.5	--
Flow Rate (volumetric)	Q	0.006	cfs
Ponding Depth Surface Area	A_{PD}	800	ft^2
Bioretention Surface Area	A_S, A_G	800	ft^2
	A_S, A_G	0.0184	ac
Porosity of Bioretention Soil	n	0.40	-
Flow Rate (per unit area)	q	0.811	in/hr
Effective Ponding Depth	PD_{eff}	6.00	in
Flow Coefficient	C	0.1254	--

Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

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Project Name: BDM Mixed Use

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☑ Included ☐ Not applicable

Provided for reference only, at this time, a part of Tentative Map processing.

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

Attachment 3: For private entity operation and maintenance, Attachment 3 must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☐ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☐ BMP and HMP location and dimensions
- ☐ BMP and HMP specifications/cross section/model
- ☐ Maintenance recommendations and frequency
- ☐ LID features such as (permeable paver and LS location, dim, SF).

The City of SAN DIEGO

RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO AND
WHEN RECORDED MAIL TO:
BDM Investments, LLC
9523 La Jolla Farms Road
La Jolla, California 92037

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSORS PARCEL NUMBER:	PROJECT NUMBER:
	645-080-22 thru 27 & 29	

This agreement is made by and between the City of San Diego, a municipal corporation [City] and _____

_____,

the owner or duly authorized representative of the owner [Property Owner] of property located at
5400 Block of Otay Mesa Road, San Diego, CA 92173
(PROPERTY ADDRESS)

and more particularly described as: _____

_____

(LEGAL DESCRIPTION OF PROPERTY)

in the City of San Diego, County of San Diego, State of California.

Property Owner is required pursuant to the City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, Chapter 14, Article 2, Division 2, and the Land Development Manual, Storm Water Standards to enter into a Storm Water Management and Discharge Control Maintenance Agreement [Maintenance Agreement] for the installation and maintenance of Permanent Storm Water Best Management Practices [Permanent Storm Water BMP's] prior to the issuance of construction permits. The Maintenance Agreement is intended to ensure the establishment and maintenance of Permanent Storm Water BMP's onsite, as described in the attached exhibit(s), the project's Storm Water Quality Management Plan [SWQMP] and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): _____.

Property Owner wishes to obtain a building or engineering permit according to the Grading and/or Improvement Plan Drawing No(s) or Building Plan Project No(s): _____.

Continued on Page 2

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMP's, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): _____.

2. Property Owner shall install, maintain and repair or replace all Permanent Storm Water BMP's within their property, according to the OMP guidelines as described in the attached exhibit(s), the project's SWQMP and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) _____.

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibit(s): _____

_____
(Owner Signature)

_____
(Print Name and Title)

_____
(Company/Organization Name)

_____
(Date)

THE CITY OF SAN DIEGO

APPROVED:

_____
(City Control Engineer Signature)

_____
(Print Name)

_____
(Date)

NOTE: ALL SIGNATURES MUST INCLUDE NOTARY ACKNOWLEDGMENTS PER CIVIL CODE SEC. 1180 ET.SEQ.

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

Project Name: BDM Mixed Use

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

The plans must identify:

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

Attachment 5
Drainage Report

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

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Attachment 6
Geotechnical and Groundwater Investigation Report

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

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