Appendix E

Water Quality Management Plan

City of Temecula
WATER QUALITY MANAGEMENT PLAN (WQMP)

PROJECT NAME & PERMIT Nº:
Sage Temecula Senior Apartments

PROJECT ADDRESS:
80134 Winchester Road, Temecula, California 92591

PROJECT APN:
920-110-005

PREPARED BY:

Name	Diamond West, Inc
Address	23801 Calabasas Rd, Suite #1034, Calabasas, CA 91302
Phone	818-444-1800
Email	bill@diamondwest.net

PREPARED FOR:

Name	Willis Development. LLC
Address	755 N Peach Ave, Suite #E6, Clovis, CA 93611
Phone	559-246-0686
Email	Corey@willisdev.com

DATE OF WQMP:
04-17-2024

APPROVED BY:

APPROVAL DATE:

Applicant's Certification

Project Name: Sage Temecula Senior Apartments
Permit Number:

APPLICANT'S CERTIFICATION

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

I hereby declare that the design is consistent with the requirements of the City of Temecula BMP Design Manual, which is a design manual for compliance with local City of Temecula Stormwater and Urban Runoff Management and Discharge Controls Ordinance (Chapter 8.28 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for stormwater management; as well as the requirements of the City of Temecula Engineering and Construction Manual (Chapter 18) and the City of Temecula Erosion and Sediment Control Ordinance (Chapter 18.18 et seq.).

Applicant's Signature Date:

Bill Cunningham, PE

Print Name

Diamond West, Inc.

Company

STOP! Before continuing this form review Chapter 1.3 of the BMP Design Manual. If the project type is listed in Table 1-2, permanent stormwater requirements do not apply to your project. Write your exempt project category in the space provided below and skip to Step 3. Do not complete Steps 1, 2, or 4 of this WQMP.

Exempt Project category

Step 1: Source Control BMP Checklist

Source Control BMPs			
All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the City BMP Design Manual for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the City BMP Design Manual. Discussion / justification must be provided and **show locations on the project plans**. Select applicable Source Controls in the Source Control BMP summary on the following page. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A

Discussion / justification:

The proposed land use may result in non-stormwater discharges that are not to be entered into the MS4. The following applicable source control BMPs are expected to be implemented to help prevent the illicit discharge into the MS4.

SC-A: Onsite storm drain inlets.

- Onsite storm drain inlets will be provided to capture and convey stormwater runoff and connected to site treatment BMPs.

SC-B: Interior flood drains and elevator shaft sump pumps.

- Interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.

SC-D1: Need for future indoor & structural pest control.

- Building to be designed to discourage entry of pest

SC-D2: Landscape/Outdoor pesticide use.

- The Final Landscape plans will accomplish the following:
- Preserve existing drought tolerant trees, shrubs, and ground cover to the maximum extent possible
- Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.
- Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of periodic saturated soil conditions
- Consider using pest-resistant plants, especially adjacent to hardscape.
- Ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, landuse, air movement, ecological consistency, and plant interactions.

SC-E: Pools, spas, ponds, decorative fountains and other water features.

- If the required pools, ponds, decorative fountains and other water features will be plumbed to sanitary sewer in accordance with local requirements.

SC-G: Refuse Areas

- Refuse will be handled by the City's contracted waste hauler
- Refuse stored for pickup within roofed, walled trash enclosure designed in accordance with City of Temecula City-wide Guidelines. (See Architectural plans)
- Signs will be posted on or near dumpster with the words "***DO NOT DUMP HAZARFOUS MATERIALS HERE***" or similar (refer to the Architectural site plan for specific locations)

SC-N: Fire Sprinkler Test Water

- A means to drain fire sprinkler test water to the sanitary sewer will be provided.

SC-O: Miscellaneous Drain or Wash Water

- Boiler drain lines shall be directly of indirectly connected to sanitary sewer system and may not discharge to the storm drain system
- Condensate drain line may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to storm drain system.
- Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment.
- Any drainage sumps onsite shall feature a sediment sump to reduce the quantity of sediment in pumped water
- Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.

SC-P: Plazas, sidewalks, and parking lots

- Plaza, sidewalks and parking lots will be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to avoid entering the storm drain system. Cleaning to be provided by the owner.

4.2.2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
Discussion / justification: Stencil and signage installation for storm drains is planned for the proposed catch basins. Please refer to the construction notes on the grading and drainage plan during the construction/final engineering document stage for the precise location of these catch basins			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification: Materials that have the potential to pollute storm water runoff are expected to be stored indoors.			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification: No materials are expected to be stored outdoors. No outdoor work areas are proposed.			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification: Trash storage areas will be housed in dumpsters and protected from the elements. Proposed trash enclosures are covered, with roof drainage directed towards landscape areas or connected to the onsite stormwater drainage system. The trash enclosures will be designed to be hydraulically isolated from the surrounding area. A drain will be provided to capture and redirect potential leaks to the onsite sewer system.			
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants	☒Yes	☐No	☐N/A
Discussion / justification. Clearly identify which sources of runoff pollutants are discussed: Onsite storm drain inlets with filters to capture potential pollutants from sidewalks & parking lots.			

Source Control BMP Summary			
Select all source control BMPs identified for your project in sections 4.2.1 through 4.2.6 above in the column on the left below. Then select "yes" if the BMP has been implemented **and shown on the project plans**, "No" if the BMP has not been implemented, or "N/A" if the BMP is not applicable to your project.			
☒ SC-A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☐ SC-B. Interior floor drains and elevator shaft sump pumps	☐Yes	☐No	☒N/A
☐ SC-C. Interior parking garages	☐Yes	☐No	☒N/A
☒ SC-D1. Need for future indoor & structural pest control	☐Yes	☒No	☐N/A
☒ SC-D2. Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☒ SC-E. Pools, spas, ponds, fountains, and other water features	☒Yes	☐No	☐N/A
☐ SC-F. Food service	☐Yes	☐No	☒N/A
☒ SC-G. Refuse areas	☒Yes	☐No	☐N/A
☐ SC-H. Industrial processes	☐Yes	☐No	☒N/A
☐ SC-I. Outdoor storage of equipment or materials	☐Yes	☐No	☒N/A
☐ SC-J. Vehicle and equipment cleaning	☐Yes	☐No	☒N/A
☐ SC-K. Vehicle/equipment repair and maintenance	☐Yes	☐No	☒N/A
☐ SC-L. Fuel dispensing areas	☐Yes	☐No	☒N/A
☐ SC-M. Loading docks	☐Yes	☐No	☒N/A
☒ SC-N. Fire sprinkler test water	☒Yes	☐No	☐N/A
☒ SC-O. Miscellaneous drain or wash water	☐Yes	☒No	☐N/A
☒ SC-P. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
☒ SC-Q. Large trash generating facilities	☒Yes	☐No	☐N/A
☐ SC-R. Animal facilities	☐Yes	☐No	☒N/A
☐ SC-S. Plant nurseries and garden centers	☐Yes	☐No	☒N/A
☐ SC-T. Automotive facilities	☐Yes	☐No	☒N/A

Note: Show all source control measures applied above on the plan sheets.

Step 2: Site Design BMP Checklist

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

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
Discussion / justification: At some point in its history, the existing site appears to have undergone mass grading, with surface drains directing water to the east and discharging it into Tucalota Creek channel through an existing 108" CMP culvert. The proposed project aims to preserve the original flow patterns and discharge location as much as possible. Existing natural drainage channels to the north will also be protected from alteration, allowing them to maintain their current drainage pattern.			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
Discussion / justification: *The project will maintain a portion of the site to the north as undeveloped/natural area.*			
4.3.3 Minimize Impervious Area	☒Yes	☐No	☐N/A
Discussion / justification: A portion of the northern site will be preserved as natural undisturbed open space. Additionally, a significant amount of pervious landscape area is proposed throughout the site, with streets, sidewalks, and parking lot aisles designed to the minimum necessary widths..			
4.3.4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
Discussion / justification: Soil compaction will be minimized by avoiding disturbance in proposed landscaped areas wherever feasible. In instances where compaction cannot be avoided, the soil will be retilled to enhance infiltration capacity. The project's objective is to implement landscape areas with minimal compaction, preserving natural infiltration capacity. Soil compaction will be minimized by avoiding disturbance in proposed landscaped areas where feasible. In areas where compaction could not be avoided, retiling of soils to allow for better infiltration capacity. The projects goal is to implement landscape areas that will not be overly compacted to preserve natural infiltration capacity.			
4.3.5 Impervious Area Dispersion	☒Yes	☐No	☐N/A
Discussion / justification:			

When possible and practical, runoff from impervious surfaces like walkways, parking areas, and plazas will be guided towards pervious landscape areas to encourage incidental infiltration and evaporation. Roof tops, parking lots, and sidewalks will be designed to drain into landscape areas whenever feasible.			
4.3.6 Runoff Collection	☐Yes	☒No	☐N/A
Discussion / justification: Runoff collection (such as rainwater harvesting) is not considered feasible for the project as there is not enough demand to justify storage. Additional			
4.3.7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐No	☐N/A
Discussion / justification: The landscape design and plant palette will be considered to minimize, to the greatest extent possible, the required resources such as irrigation, fertilizers, and pesticides. The selection will align with the desired aesthetics of the developer. The proposed landscape area will primarily consist of native and/or drought-tolerant plant species. Additionally, the water use for the proposed landscape area is expected to comply with the City of Temecula Irrigation Guidelines			
4.3.8 Harvesting and Using Precipitation	☐Yes	☒No	☐N/A
Discussion / justification: Harvest and Use features within the project are not consider technically feasible due to the expected demand to be insufficient.			

Step 3: Construction Stormwater BMP Checklist

Minimum Required Standard Construction Stormwater BMPs		
If you answer "Yes" to any of the questions below, your project is subject to Table 1 on the following page (Minimum Required Standard Construction Stormwater BMPs). As noted in Table 1, please select at least the minimum number of required BMPs[1], or as many as are feasible for your project. If no BMP is selected, an explanation must be given in the box provided. The following questions are intended to aid in determining construction BMP requirements for your project. **Note: All selected BMPs below must be included on the BMP plan incorporated into the construction plan sets.**		
1. Will there be soil disturbing activities that will result in exposed soil areas? (This includes minor grading and trenching.) **Reference Table 1 Items A, B, D, and E** Note: Soil disturbances NOT considered significant include, but are not limited to, change in use, mechanical/electrical/plumbing activities, signs, temporary trailers, interior remodeling, and minor tenant improvement.	☒Yes	☐No
2. Will there be asphalt paving, including patching? **Reference Table 1 Items D and F**	☒Yes	☐No
3. Will there be slurries from mortar mixing, coring, or concrete saw cutting? **Reference Table 1 Items D and F**	☒Yes	☐No
4. Will there be solid wastes from concrete demolition and removal, wall construction, or form work? **Reference Table 1 Items D and F**	☒Yes	☐No

[1] Minimum required BMPs are those necessary to comply with the City of Temecula Erosion and Sediment Control Ordinance (Chapter 18.18 et seq.) and the City of Temecula Engineering and Construction Manual (Chapter 18).

5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours? **Reference Table 1 Items D and F**	☒Yes	☐No
6. Will there be dewatering operations? **Reference Table 1 Items C and D**	☒Yes	☐No
7. Will there be temporary on-site storage of construction materials, including mortar mix, raw landscaping and soil stabilization materials, treated lumber, rebar, and plated metal fencing materials? **Reference Table 1 Items E and F**	☒Yes	☐No
8. Will trash or solid waste product be generated from this project? **Reference Table 1 Item F**	☒Yes	☐No
9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?) **Reference Table 1 Item F**	☒Yes	☐No
10. Will Portable Sanitary Services (“Porta-potty”) be used on the site? **Reference Table 1 Item F**	☒Yes	☐No

Table 1. Construction Stormwater BMP Checklist

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook[2] Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
A. Select Erosion Control Method for Disturbed Slopes (choose at least one for the appropriate season)			
Vegetation Stabilization Planting[3] (Summer)	SS-2, SS-4	☐	The details of this will be defined, and applicable plan sheet numbers will be provided at the time of the Final Water Quality Management Plan (WQMP).
Hydraulic Stabilization Hydroseeding[2] (Summer)	SS-4	☐	
Bonded Fiber Matrix or Stabilized Fiber Matrix[4] (Winter)	SS-3	☒	
Physical Stabilization Erosion Control Blanket[3] (Winter)	SS-7	☒	
B. Select erosion control method for disturbed flat areas (slope < 5%) (choose at least one)			
Will use erosion control measures from Item A on flat areas also	SS-3, 4, 7	☒	The details of this will be defined, and applicable plan sheet numbers will be provided at the time of the Final Water Quality Management Plan (WQMP).
Sediment Desilting Basin (must treat all site runoff)	SC-2	☒	
Mulch, straw, wood chips, soil application	SS-6, SS-8	☐	

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

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

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

Table 1. Construction Stormwater BMP Checklist (continued)

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

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

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

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

Step 4: Project type determination (Standard or Priority Development Project)

Is the project part of another Priority Development Project (PDP)? ☐ Yes ☒ No If so, Standard and PDP requirements apply. Go to Step 4.1 and select "PDP"			
The project is (select one): ☒ New Development ☐ Redevelopment[7]			
The total proposed newly created or replaced impervious area is: 167,772 ft²			
The total existing (pre-project) impervious area is: 0 ft²			
The total area disturbed by the project is: 228,889.8 ft²			
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number must be obtained from the State Water Resources Control Board. **WDID: TBD (Prior to grading Permit Issuance)**			
Is the project in any of the following categories, (a) through (f)?[8]			
Yes ☒	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces [9](collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

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

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

Project type determination (continued)

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

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

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

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

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

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

The area of existing (pre-project) impervious area at the project site is: N/A ft^2 (A)

The total proposed newly created or replaced impervious area is N/A ft^2 (B)

Percent impervious surface created or replaced (B/A)*100: N/A %

The percent impervious surface created or replaced is (select one based on the above calculation):

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

OR

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

Step 4.1: Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 4 Project Type Determination Checklist, and see PDP exemption information below. For further guidance, see Chapter 1.4 of the BMP Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, **STOP, you have satisfied stormwater requirements.**
	☒ PDP	Standard and PDP requirements apply. **Complete Exhibit A "PDP Requirements."** **http://temeculaca.gov/wqmpa2**
	☐ PDP Exemption	**Go to Step 4.2 below.**

Step 4.2: Exemption to PDP definitions

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

Exhibit A
City of Temecula
PRIORITY DEVELOPMENT PROJECT REQUIREMENTS

Preparer's Certification Page

Project Name: Sage Temecula Senior Apartments
Permit Application Number: _____

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of Stormwater best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of Temecula BMP Design Manual, which is a design manual for compliance with local City of Temecula Stormwater and Urban Runoff Management and Discharge Controls Ordinance (Chapter 8.28 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for stormwater management.

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

_____
Engineer of Work's Signature, PE Number & Expiration Date

Bill Cunningham, PE
Print Name

Diamond West Inc. 818-591-1050
Company & Phone No.

04-18-2024
Date

Engineer's Seal:

Preparation Date:_04-17-2024___ Template Date: August 14th, 2022

Step 1: Site Information Checklist

Description of Existing Site Condition and Drainage Patterns

Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier; e.g., 902.52 Santa Margarita HU, Pechanga HA, Wolf HSA)	902.42 Santa Margarita HU, Auld HA, Gertrudis HSA

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

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

Description / Additional Information:

The Project Site is 5.93 acres of vacant land located at 80134 Winchester Road (APN 920-110-005) in the City of Temecula. The site fronts Winchester Road (State Highway 79) to the West, Santa Gertrudis Creek Channel to the South, vacant land and Tucalota Creek Channel to the East and vacant land to the North. The City/County boundary borders the North-West, North-East, and South-East property lines.
West of Winchester Road, across from the project site and east beyond the Tucalota Creek Channel, there are single-family residential developments. Farther south of Santa Gertrudis Creek Channel is the Rancho Temecula Town Center.
The property currently sits approximately 8-10 feet below Winchester Road. Based on the site survey, it appears site drainage generally flows in an easterly direction to the adjacent vacant property to the East and then to a storm drain culvert that conveys stormwater through a channel berm into Tucalota Creek Channel. According to FEMA maps the site is not located within a FEMA Flood Zone.

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

- ☒ Pervious Area 5.93 Acres (273,556 Square Feet)
- ☐ Impervious Areas _____ Acres (_____Square Feet)

Description / Additional Information:

How is stormwater runoff conveyed from the site? At a minimum, this description should answer:
(1) Whether existing drainage conveyance is natural or urban;
(2) Is runoff from offsite conveyed through the site? If yes, describe the offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, stormwater treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations. Reference the Drainage report Attachment for detailed calculations.

Describe existing site drainage patterns:
(1) The current drainage conveyance on the project site relies on natural surface runoff, predominantly flowing eastward towards the property lines. Ultimately, this runoff converges and is collected by an existing 108" CMP culvert situated in the adjacent property, discharging into Tucalota Creek Channel. Runoff from the adjacent parcel enters the project site from the northern portion through surface runoff. All offsite and onsite drainage exits the site from the southeast portion via a culvert leading to Tucalota Creek.

(2) There are no existing site drainage conveyance networks or improvements, aside from minor top-of-slope berms. For additional details, please refer to the Drainage Report

Description of Proposed Site Development and Drainage Patterns

Project Description / Proposed Land Use and/or Activities:
Sage Temecula Senior Apartment (STSA) is a proposed active adult, 55+ senior citizen, housing complex. Market research indicates a need in Temecula for communities designed for Older Adults. Therefore, the proposed program for STSA includes a four-story building, approximately 202,000 square feet, consisting of 143 market-rate rental apartments.

The overall project parcel consists of approximately 5.93 acres with an onsite drainage area of approximately 5.51 acres. The 0.42-acre difference results from self-mitigation areas (existing pervious areas to remain). The proposed improvements include a four-story building, parking lot, internal courtyard, walkways, and a sports court. Drainage from the building will be conveyed by roof drainage and connected to the proposed storm drain network or landscape areas (where feasible). Drive aisle, parking lot, and hardscape areas will surface drain to proposed curb and gutters and be conveyed to onsite catch basins, ultimately directed to a proposed biofiltration pond located at the north end of the proposed parking lot. Treated and mitigated flows will discharge to the open space area onsite from the proposed biofiltration pond via an overflow structure and will be allowed to follow historic drainage patterns. Once flows leave the site, they will follow existing flow paths to an existing 108" CMP culvert leading to the Tucalota Creek Channel.

Proposed Land Cover Includes (select all that apply and provide each area on site):
Existing to Remain
☒ Pervious Area: **2.119 Acres (92,305 Square Feet)**
☐ Impervious Areas _____ Acres (_____ Square Feet)
Existing to Be Replaced
☐ Pervious Area _____ Acres (_____ Square Feet)
☐ Impervious Areas _____ Acres (_____ Square Feet)
Newly Created
☐ Pervious Area _____ Acres (_____ Square Feet)
☒ Impervious Areas: **3.815 Acres (167,772 Square Feet)**
Total
☒ Pervious Area: **2.08 Acres (90,720 Square Feet)**
☒ Impervious Areas: **3.815 Acres (167,772 Square Feet**)

Description / Additional Information:

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

Senior Apartment Building: A new structure designed for senior housing, contributing to the impervious footprint of the project.

Access Roadways: Planned roadways to facilitate entry and exit, providing essential access to the project site.

Parking Lots: Designated areas for vehicle parking, contributing to the impervious surfaces of the project.

Sidewalks and Hardscape: Additional pathways and hardscape within the building courtyard, contributing to the overall impervious area.

Pickleball Courts: The proposed addition of pickleball courts, which are impervious surfaces designed for recreational use.

These impervious features collectively represent the built elements of the project, contributing to the overall character and functionality of the site.

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

Landscape Areas: Planned green spaces with vegetation, trees, and other landscaping elements designed to enhance the aesthetics of the project while allowing for water absorption.

Green Courtyards: Pervious areas within the project designed as open, green spaces for recreational use or relaxation.

These pervious features are strategically integrated into the project design to balance impervious surfaces, promote sustainable practices, and enhance the overall environmental quality of the development.

Describe any grading or changes to site topography:
The proposed project involves grading and modifications to the site's topography, including:

Elevated Grading: Adjustments to the elevation of specific areas, such as the creation of building pads and other infrastructural elements. The proposed grading will raise the elevation of the site by 2-6 feet, contributing to the overall design and functionality of the development.

Sloping: Implementation of sloping features to facilitate proper drainage and water flow across the site. Specifically, sloping not to exceed 2:1 is proposed for the driveway connection to the right of way along Winchester Road. This design consideration aims to ensure safe and efficient access while adhering to established slope standards

Cut and Fill: The project will involve a fill condition to elevate the site. Excavation (cut) and placement of soil (fill) will be strategically implemented to achieve desired contours and elevations, ensuring a balanced and stable site for the proposed development.

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

Describe proposed site drainage patterns:

The proposed project site will undergo grading primarily to direct stormwater runoff towards private storm drain inlets and drainage networks. The runoff will be captured and conveyed to a proposed above-ground Biofiltration/Detention stormwater mitigation pond. This specialized Biofiltration pond is preliminarily sized to capture and treat 100% of the calculated Design Capture Volume (DCV). Any flows exceeding the calculated DCV will overflow and discharge along the existing flow path to the north, maintaining the historic drainage pattern. Additionally, the Biofiltration pond is sized to provide extra detention for hydromodification which will be further developed and outlined in the projects Drainage Report.

As part of stormwater management, parking lot catch basins will be installed, featuring catch basin filters as pre-treatment Best Management Practices (BMPs).

The project also involves street improvements on Winchester Road. Stormwater runoff in Winchester Road, flowing from north to south, will be captured and conveyed via curb and gutter to a public catch basin located adjacent to the project's frontage. The existing catch basin will be retrofitted with approved catch basin filters to treat the calculated DCV produced by the proposed new/redeveloped impervious areas. For detailed calculations and developed conditions hydrology exhibits, please refer to the Drainage Report

Description of Receiving Water(s) and Pollutants of Concern

Describe flow path of stormwater from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):

Site stormwater discharges into Tucalota Creek which merges into Santa Gertrudis Creek, Murrieta Creek, Santa Margarita River (Upper), Santa Margarita River (Lower), Santa Margarita Lagoon and ultimately discharges into Pacific Ocean.

List any 303(d) impaired water bodies[1] within the path of stormwater 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 (see BMP Design Manual Appendix B.6.1):

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
Santa Gertrudis Creek	Chlorpyrifos, Copper, Indicator Bacteria, Iron, Manganese, Nitrogen, Phosphorus.	*Nutrient*
Murrieta Creek	*Benthic Community Effects, Bifenthrin, Chlorpyrifos, Copper, Cyhalothrin, Lambda, Indicator Bacteria, Iron, Manganese, Mercury, Nitrogen, Oxygen, Dissolved, Phosphorus, Pyrethroids, Toxicity, Turbidity.*	*Nutrient*
Santa Margarita River (Upper)	*Benthic Community Effects, Bifenthrin, Cyhalothrin, Lambda, Indicator Bacteria, Iron, Manganese, Nitro0gen, Phosphorus, Pyrethroids, Total Dissolved Solids, Toxicity, Turbidity.*	*Nutrient*
Santa Margarita River (Lower)	*Benthic Community Effects, Chlorpyrifos, Indicator Bacteria, Nitrogen, Phosphorus, Toxicity.*	*Nutrient*
Santa Margarita Lagoon	*Eutrophic*	*Nutrient*

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

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	X	☐
Nutrients	☐	X	X
Heavy Metals	☐	X	☐

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

Organic Compounds	☐	X	☐
Trash & Debris	☐	X	☐
Oxygen Demanding Substances	☐	X	☐
Oil & Grease	☐	X	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	X	☐

Site Requirements and Constraints

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

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

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

OR

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

List applicable site requirements or constraints that will influence stormwater management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements:

Optional Additional Information or Continuation of Previous Sections As Needed

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

Step 2: Strategy for Meeting PDP Performance Requirements

PDPs must implement BMPs to control pollutants in stormwater that may be discharged from a project (see Chapter 5). PDPs subject to hydromodification management requirements must implement flow control BMPs to manage hydromodification (see Chapter 6). Both stormwater pollutant control and flow control can be achieved within the same BMP(s). Projects triggering the 50% rule must address stormwater requirements for the entire site.

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

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

Describe the general strategy for BMP implementation at the site.

To adhere to the stormwater quality management requirements stipulated in the 2018 City of Temecula BMP Design Manual, the project will incorporate site design Best Management Practices (BMPs) wherever feasible and practicable. These BMPs aim to treat stormwater and mitigate the required Design Capture Volume (DCV) before discharge from the proposed Biofiltration pond into the existing drainage path to the north. The Biofiltration pond is adequately sized to treat 100% of the onsite DCV, and detailed calculations will be provided in accordance with the guidelines outlined in the City of Temecula BMP Design Manual.

For offsite street improvements, the Water Quality Equivalency (WQE) guidance document for Region 9, dated May 2018, will be utilized to ascertain the design capture volume (DCV) resulting from these enhancements. The project anticipates participating in the City of Temecula's alternative compliance program (ACP) by procuring credits for the offsite frontage sidewalk improvements. Further coordination with the City of Temecula is essential and will be refined as the project advances into the final engineering stage. Although the preliminary concept/approach is outlined in this document, the ACP in-lieu fee payment and transaction are anticipated to take place during the Final Water Quality Management Plan (WQMP) phase in the construction document stage

ATTACHMENT 1

STORMWATER POLLUTANT CONTROL BMP SELECTION

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
	Special Considerations for Redevelopment Projects (50% Rule) see chapter 1.7 and Step 1.3	☐ Less than or equal to fifty percent (50%) ☐ Greater than fifty percent (50%)
Refer to Figure 5-1: Stormwater Pollutant Control BMP Selection Flow Chart		
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this form. See Chapter 3.3.3 for guidance	☒ Included ☐ Entire project is designed with Self-Mitigating and De-Minimis DMAs. The project is compliant with Pollution Control BMP sizing requirements. **STOP** *
Attachment 1b	Figure B.1-1: 85th Percentile 24-hour Isohyetal Map with project location	☒ Included
Attachment 1c	Worksheet B.3-1 Structural BMP Feasibility: Project-Scale BMP Feasibility Analysis	☒ Included
Attachment 1d	Worksheet B.2-1 DCV [2]	☒ Included
Attachment 1e	Applicable Site Design BMP Fact Sheet(s) from Appendix E	☒ Included ☐ Entire project is designed with Self-Retaining DMAs. The project is compliant with Pollution Control BMP sizing requirements. **STOP** *
Attachment 1f	Structural BMP Inventory	☒ Included
Attachment 1g	Structural Pollutant Control BMP Checklist **for each Structural BMP**	☒ Included
Attachment 1h	Is Onsite Alternative Compliance proposed?[3]	☐ No ☒ Yes - Include WQE worksheets
Attachment 1i	Offsite Alternative Compliance Participation Form - Pollutant Control Refer to Figure 1-3:Pathways to Participating in Offsite Alternative Compliance Program	☐ Full Compliance Onsite ☒ Partial Compliance Onsite with Offsite Alternative Compliance or Full Offsite Alternative Compliance. Document onsite structural BMPs and complete - Pollutant Control Offsite Alternative Compliance Participation Form, and - WQE worksheets

* If this box is checked, the remainder of Attachment 1 does not need to be filled out.

[2] All stormwater pollutant control worksheets have been automated and are available for download at: https://www.sandiegocounty.gov/content/sdc/dpw/watersheds/DevelopmentandConstruction/BMP_Design_Manual.html

[3] Water Quality Equivalency Guidance and automated worksheets for Region 9: http://www.projectcleanwater.org/water-quality-equivalency-guidance/

Attachment 1a:

DMA Exhibit

Attachment 1a: DMA Exhibit Checklist

See Chapter 3.3.3 for guidance

- ☒ Point(s) of Compliance
- ☒ Project Site Boundary
- ☒ Project Disturbed Area Footprint
- ☒ Drainage management area (DMA) boundaries, DMA ID numbers, DMA areas (square footage or acreage), DMA land use and pollutants of concern, and DMA type (i.e., drains to structural BMP, self-retaining, self-mitigating, or de-minimis) Note on exhibit de-minimis areas and discuss reason they could not be included in Step 1.3 per section 5.2.2 of the manual. Include offsite areas receiving treatment to mitigate Onsite Water Quality Equivalency.
- ☒ Include summary table of worksheet inputs for each DMA.
- ☒ Include description of self-mitigating areas.
- ☒ Potential pollutant source areas and corresponding required source control BMPs (see Chapter 4, Appendix E.1, and Step 3.5)
- ☐ Proposed Site Design BMPs and surface treatments used to minimize imperviousness. Show sections, details, and dimensions of site design BMP's per chapter 5.2.3 (tree wells, dispersion areas, rain gardens, permeable pavement, rain barrels, green roofs, etc.)
- ☐ Proposed Harvest and Use BMPs
- ☒ Underlying hydrologic soil group (Web Soil Survey)
- ☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands, pond, lake)
- ☒ Existing topography and impervious areas
- ☒ Proposed grading and impervious areas. If the project is a subdivision or spans multiple lots show pervious and impervious totals for each lot.
- ☒ Existing and proposed site drainage network and connections to drainage offsite
- ☒ Potable water wells, onsite wastewater treatment systems (septic), underground utilities
- ☒ Structural BMPs (identify location, structural BMP ID No., type of BMP, and size/detail)
- ☐ Approximate depth to groundwater at each structural BMP
- ☒ Approximate infiltration rate and feasibility (full retention, partial retention, biofiltration) at each structural BMP
- ☐ Critical coarse sediment yield areas to be protected and or conveyed through the project site, if applicable.
- ☐ Temporary Construction BMPs. Include protection of source control, site design and structural BMPs during construction.

LEGEND:

- 1150 — PROPOSED CONTOUR
- (1150) — EXISTING CONTOUR
- 98.00 — SPOT ELEVATION; TC — DESCRIPTION OF ELEVATION
- (98.00) — EXISTING SPOT ELEVATION; EG — DESCRIPTION OF ELEVATION
- DRAINAGE MANAGEMENT AREA (DMA)
- DRAINAGE SUB-AREA
- HYDRAULIC FLOW PATH
- PROPERTY BOUNDARY
- SD — PROPOSED STORM DRAIN
- HYDROLOGIC SOIL GROUP BOUNDARY
- POINT OF COMPLIANCE
- DMA-1 — DRAINAGE MANAGEMENT AREA (DMA) LABEL
- XX / A / Q — Subarea; Q_{50} (cfs); Area (acres)
- OVERLAND FLOW ARROW
- PROPOSED NEW IMPERVIOUS AREA- ONSITE
- BUILDING SHADING-ONSITE
- PROPOSED NEW IMPERVIOUS AREA -OFFSITE
- LANDSCAPING
- EXISTING IMPERVIOUS AREA - OFFSITE
- EXISTING IMPERVIOUS AREA TO BE REDEVELOPED -OFFSITE
- SELF-MITIGATING AREA
- BIOFILTRATION (SPECIALIZED) AREA

DMA SUMMARY

	DMA-1 (ON-SITE)	DMA-2 (Off-site)
DRAINAGE MANAGEMENT AREA (DMA)	5.507 ac	0.730 ac
NEW IMPERVIOUS AREA:	3.852 ac	0.121 ac
RE-DEVELOPED IMPERVIOUS AREA:	0.000 ac	0.156 ac
EXISTING IMPERVIOUS AREA :	0.000 ac	0.372 ac
PERVIOUS AREA:	1.656 ac	0.081 ac
85TH PERCENTILE STORM	1.0 in	1.0 in
HYDROLOGIC SOIL GROUP	C	C
TOTAL IMPRVIOUS AREA	**3.852 ac**	**0.649 ac**
DESIGN CAPTURE VOLUME REQUIRED*	**13994 CF**	**2193 CF**
DMA BMP TREATMENT TYPE:	BMP-1: PR-1: BIOFILTRATION WITH PARTIAL RETENTION	BMP-2: FT-5: PROPRIETARY FLOW-THRU TREATMENT CONTROL BMPS

* PER AutoMated Worksheet B1-1: Calculation of Design Capture Volume

Source Control BMP Summary

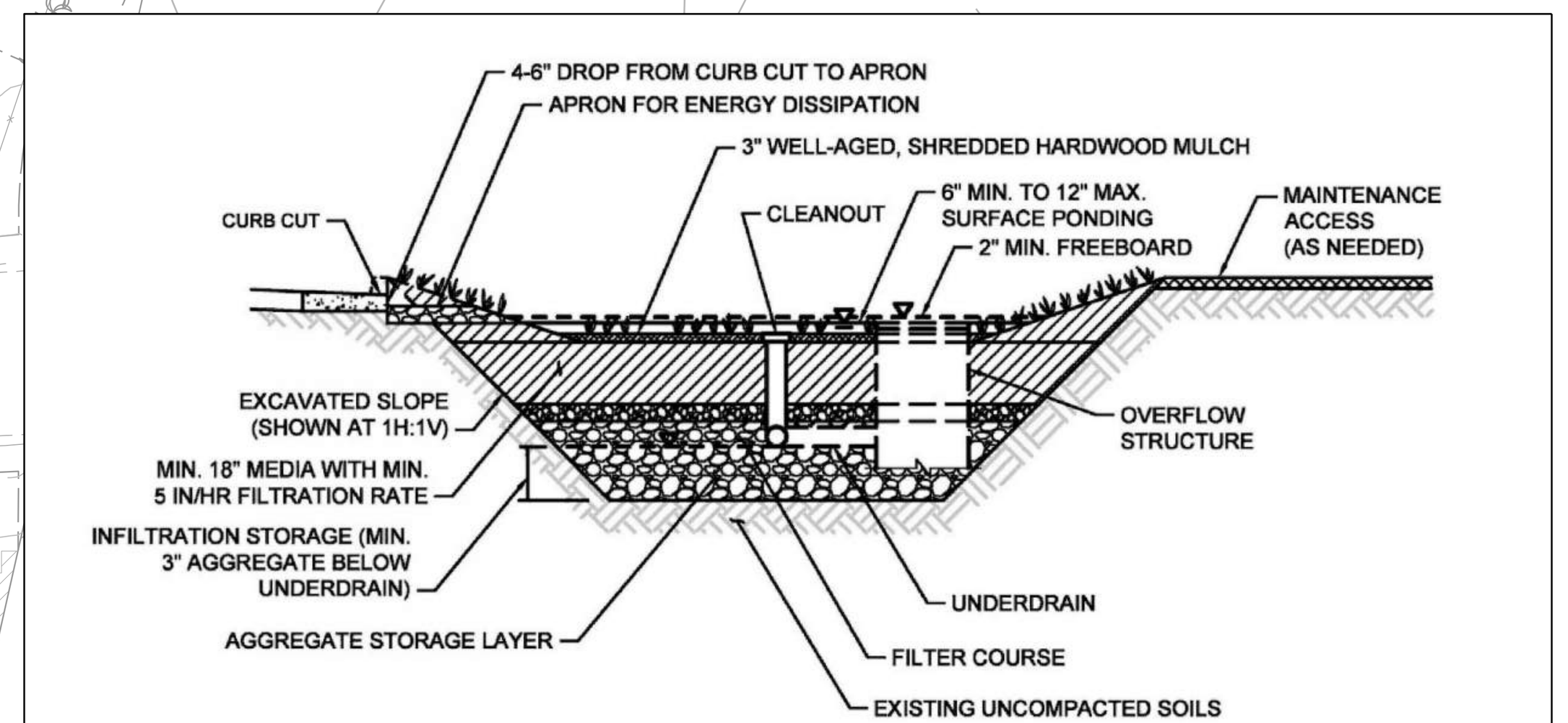
☒ SC-A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☐ SC-B. Interior floor drains and elevator shaft sump pumps	☐Yes	☐No	☒N/A
☐ SC-C. Interior parking garages	☐Yes	☐No	☒N/A
☒ SC-D1. Need for future indoor & structural pest control	☐Yes	☒No	☐N/A
☒ SC-D2. Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☒ SC-E. Pools, spas, ponds, fountains, and other water features	☒Yes	☐No	☐N/A
☐ SC-F. Food service	☐Yes	☐No	☒N/A
☒ SC-G. Refuse areas	☒Yes	☐No	☐N/A
☐ SC-H. Industrial processes	☐Yes	☐No	☒N/A
☐ SC-I. Outdoor storage of equipment or materials	☐Yes	☐No	☒N/A
☐ SC-J. Vehicle and equipment cleaning	☐Yes	☐No	☒N/A
☐ SC-K. Vehicle/equipment repair and maintenance	☐Yes	☐No	☒N/A
☐ SC-L. Fuel dispensing areas	☐Yes	☐No	☒N/A
☐ SC-M. Loading docks	☐Yes	☐No	☒N/A
☒ SC-N. Fire sprinkler test water	☒Yes	☐No	☐N/A
☒ SC-O. Miscellaneous drain or wash water	☐Yes	☒No	☐N/A
☒ SC-P. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
☒ SC-Q. Large trash generating facilities	☒Yes	☐No	☐N/A
☐ SC-R. Animal facilities	☐Yes	☐No	☒N/A
☐ SC-S. Plant nurseries and garden centers	☐Yes	☐No	☒N/A
☐ SC-T. Automotive facilities	☐Yes	☐No	☒N/A

Notes:

1. ALL ONSITE CATCH BASINS INSTALLED WITH APPROVED CATCH BASIN FILTERS.
2. MARK ALL INLETS WITH "NO DUMPING! DRAINS TO WATERWAY" OR SIMILAR.
3. SEE GEOTECHNICAL REPORT FOR INFILTRATION RATES AND FEASIBILITY.
4.

Drainage Subarea Summary

SUBAREA:	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12B	13B	14B	15B	16C
TOTAL AREA:	22654 SF	13543 SF	26656 SF	10150 SF	8142 SF	3166 SF	9682 SF	11712 SF	18641 SF	17402 SF	14089 SF	15268 SF	8064 SF	14591 SF	16373 SF	18268 SF
Impervious Area :	18657 SF	11004 SF	1974 SF	7386 SF	5366 SF	3166 SF	4317 SF	9479 SF	15049 SF	12439 SF	13045 SF	15268 SF	8064 SF	14591 SF	16373 SF	11516 SF
Pervious Area :	3997 SF	2539 SF	24682 SF	2764 SF	2777 SF	0 SF	5365 SF	2232 SF	3592 SF	4963 SF	1043 SF	0 SF	0 SF	0 SF	0 SF	6752 SF



SECTION A-A'
NOT TO SCALE

Typical plan and Section view of a Biofiltration with Partial Retention BMP

NORTH

0 20 40 80
GRAPHIC SCALE: 1" = 40' @ 30x42

PRELIMINARY
REGISTERED PROFESSIONAL ENGINEER — WILLIAM C. CUNNINGHAM — No. 80129 — Exp. 09/30/24 — CIVIL — STATE OF CALIFORNIA

WQMP DMA MAP

SAGE TEMECULA SENIOR APARTMENTS

PREPARED BY:

DIAMOND WEST
civil engineering • land surveying • land planning
23801 Calabasas Rd, Suite 1034
Calabasas, CA 91302
Phone: (818) 591-1050
www.diamondwest.net

DATE: 04/17/2024 | SHEET C-8 OF 9

Attachment 1b:

85th percentile 24-hr Isohyetal Map

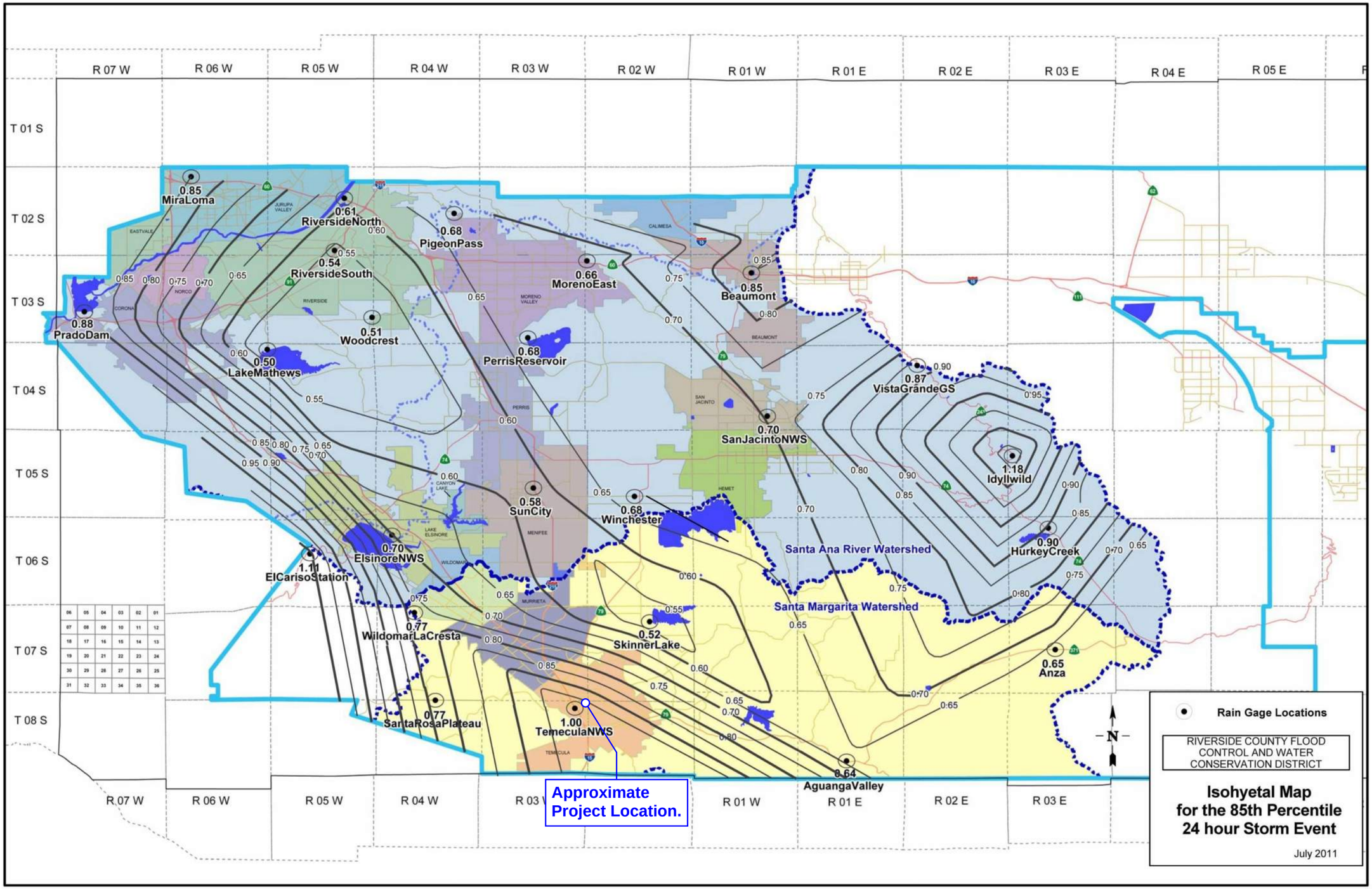


Figure B.1-1: 85th Percentile 24-hour Isohyetal Map

Attachment 1 c:

Worksheet B.3-1 Structural BMP Feasibility: Project Scale BMP Feasibility Analysis

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

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	16,187	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	100	#
	3	Total Planted Area within Development	90,720	sq-ft
	4	Water Use Category for Proposed Planted Areas	Low	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	No	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	No	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	No	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	186	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	109	cubic-feet
	13	Total Anticipated Use Over 36 Hours	295	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.02	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	Yes	yes/no
Result	18	Feasibility Category	4	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

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

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

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

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

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

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

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

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

Attachment 1 d:

Worksheet B.2-1 DCV

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

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	DMA -1 (Onsite)	DMA-2 (Offsite)									unitless
	1	Basin Drains to the Following BMP Type	Biofiltration (specialized)	Flow-Thru									unitless
	2	85th Percentile 24-hr Storm Depth	1.00	1.00									inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.193	n/a									in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	166,772	28,263									sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)	0										sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)	0										sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)	0										sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)	0										sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	73,129	3,832									sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)	0										sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No		No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	239,901	32,095	0	0	0	0	0	0	0	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.70	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.70	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	32	Initial Design Capture Volume	13,994	2,193	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.70	0.82	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	13,994	2,193	0	0	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.70	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	42	Final Effective Tributary Area	167,931	26,318	0	0	0	0	0	0	0	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	13,994	2,193	0	0	0	0	0	0	0	0	cubic-feet

Worksheet B.1-1 General Notes:

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

Attachment 1 e:

Applicable Site Design BMP Fact Sheets from Appendix E

E.17 PR-1 Biofiltration with Partial Retention

Location: 805 and Bonita Road, Chula vista, CA.

MS4 Permit Category
NA

Manual Category
Partial Retention

Applicable Performance Standard
Pollutant Control
Flow Control

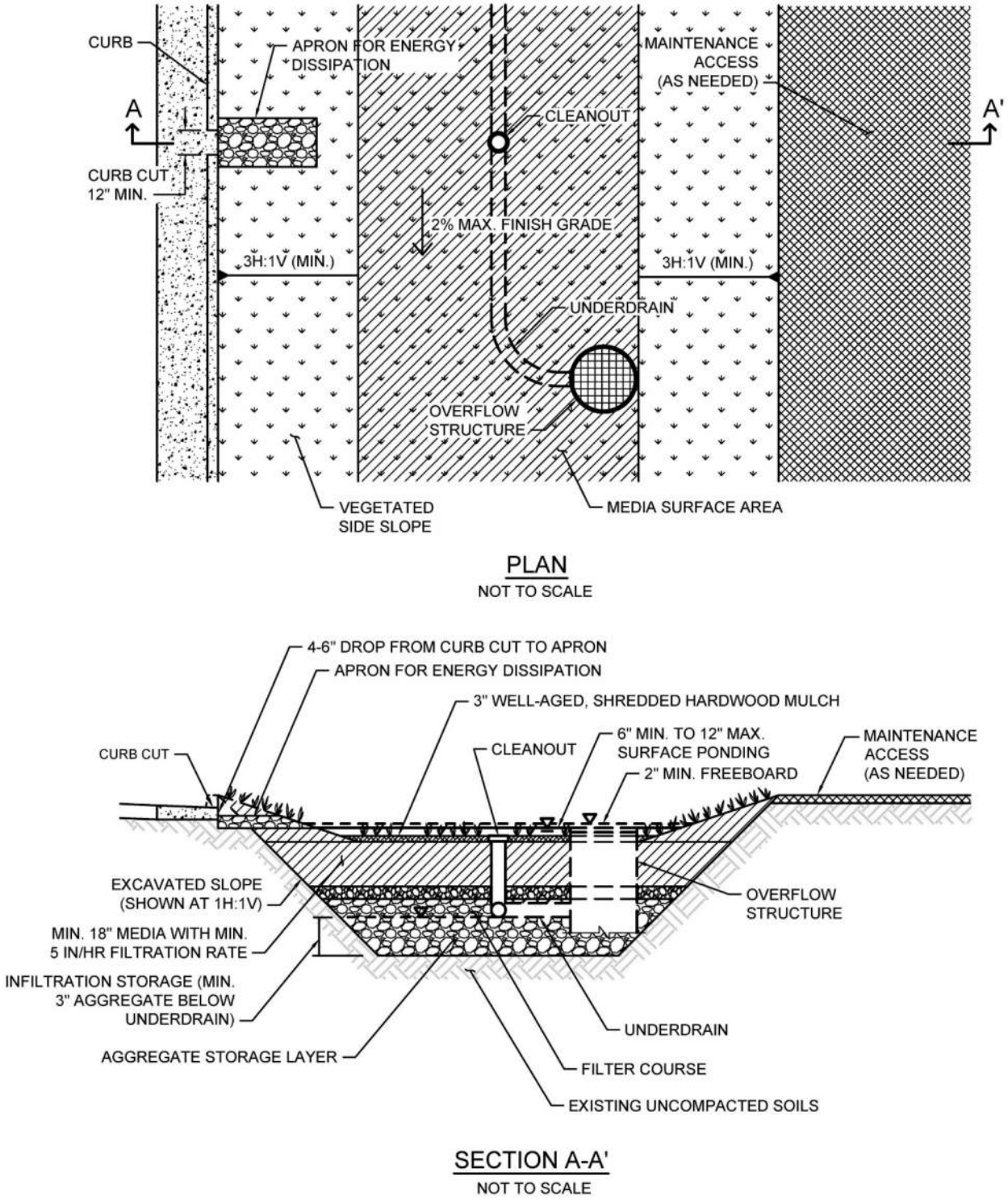
Primary Benefits
Volume Reduction
Treatment
Peak Flow Attenuation

Description

Biofiltration with partial retention (partial infiltration and biofiltration) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to infiltrating into native soils, discharge via underdrain, or overflow to the downstream conveyance system. Where feasible, these BMPs have an elevated underdrain discharge point that creates storage capacity in the aggregate storage layer. Biofiltration with partial retention facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. They can be constructed in ground or partially aboveground, such as planter boxes with open bottoms to allow infiltration. Treatment is achieved through filtration, sedimentation, sorption, infiltration, biochemical processes and plant uptake.

Typical biofiltration with partial retention components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side Slope and basin bottom vegetation selected based on climate and ponding depth
- Non-floating mulch layer (Optional)
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the optional aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Uncompacted native soils at the bottom of the facility
- Overflow structure



Typical plan and Section view of a Biofiltration with Partial Retention BMP

Design Adaptations for Project Goals

Partial infiltration BMP with biofiltration treatment for storm water pollutant control. Biofiltration with partial retention can be designed so that a portion of the DCV is infiltrated by providing infiltration storage below the underdrain invert. The infiltration storage depth should be determined by the volume that can be reliably infiltrated within drawdown time limitations. Water discharged through the underdrain is considered biofiltration treatment. Storage provided above the underdrain within surface ponding, media, and aggregate storage is included in the biofiltration treatment volume.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer. This will allow for significant detention storage, which can be controlled via inclusion of an orifice in an outlet structure at the downstream end of the underdrain.

Recommended Siting Criteria

Siting Criteria		*Intent/Rationale*
☑	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☑	Selection and design of basin is based on infiltration feasibility criteria and appropriate design infiltration rate (See Appendix C and D).	Must operate as a partial infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☑	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the [City Engineer} if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the City Engineer for proper performance of the regional BMP.
☑	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and

Siting Criteria	*Intent/Rationale*
	channelization within the facility.

Recommended BMP Component Dimensions

BMP Component	*Dimension*	*Intent/Rationale*
Freeboard	≥ 2 inches	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
Surface Ponding	≥ 6 and ≤ 12 inches	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the City Engineer if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
Ponding Area Side Slopes	3H:1V or shallower	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Mulch	≥ 3 inches	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer	≥ 18 inches	A deep media layer provides additional filtration and supports

BMP Component	*Dimension*	*Intent/Rationale*
		plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with Appendix F.1 ensures that adequate treatment performance will be provided.
Underdrain Diameter	≥ 6 inches	Smaller diameter underdrains are prone to clogging.
Cleanout Diameter	≥ 6 inches	Properly spaced cleanouts will facilitate underdrain maintenance.

Design Criteria and Considerations

Biofiltration with partial retention must meet the following design criteria and considerations. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

Design Criteria		*Intent/Rationale*
Surface Ponding		
☑	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hours for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist.
Vegetation		
☑	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.26	Plants suited to the climate and ponding depth are more likely to survive.
☑	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Optional or Mandatory – Dependent on jurisdiction)		

Design Criteria	*Intent/Rationale*
☑ A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided. Mulch must be non-floating to avoid clogging of overflow structure.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer	
☑ Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. An initial filtration rate of 8 to 12 in/hr is recommended to allow for clogging over time; the initial filtration rate should not exceed 12 inches per hour.	A filtration rate of at least 5 inches per hour allows soil to drain between events, and allows flows to relatively quickly enter the aggregate storage layer, thereby minimizing bypass. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☑ Media is a minimum 18 inches deep, meeting either of these two media specifications: Section F.3 Biofiltration Soil Media (BSM) or specific jurisdictional guidance. Alternatively, for proprietary designs and custom media mixes not meeting the media specifications, the media meets the pollutant treatment performance criteria in Section F.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with Appendix F.1 ensures that adequate treatment performance will be provided.
☑ Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless demonstrated that the BMP surface area can be smaller than 3%.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance.

Design Criteria		*Intent/Rationale*
☑	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☑	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☑	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility
☑	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer		
☑	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☑	Maximum aggregate storage layer depth below the underdrain invert is determined based on the infiltration storage volume that will infiltrate within a 36-hour drawdown time.	A maximum drawdown time is needed for vector control and to facilitate providing storm water storage for the next storm event.
Inflow, Underdrain, and Outflow Structures		
☑	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☑	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and	Inlets must not restrict flow and apron prevents blockage from vegetation as it

Design Criteria		*Intent/Rationale*
	energy dissipation as needed.	grows in. Energy dissipation prevents erosion.
☑	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☑	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☑	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☑	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☑	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Nutrient Sensitive Media Design

To design biofiltration with partial retention with underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design biofiltration with partial retention and an underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Generalized sizing procedure is presented in Appendix B.5. The surface ponding should be verified to have a maximum 24-hour drawdown time.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention and/or infiltration storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If biofiltration with partial retention cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume such as an underground vault can be used to provide remaining controls.
4. After biofiltration with partial retention has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

Maintenance Overview

Normal Expected Maintenance. Biofiltration with partial retention requires routine maintenance to: remove accumulated materials such as sediment, trash or debris; maintain vegetation health; maintain infiltration capacity of the media layer; replenish mulch; and maintain integrity of side slopes, inlets, energy dissipators, and outlets. A summary table of standard inspection and maintenance indicators is provided within this Fact Sheet.

Non-Standard Maintenance or BMP Failure. If any of the following scenarios are observed, the BMP is not performing as intended to protect downstream waterways from pollution and/or erosion. Corrective maintenance, increased inspection and maintenance, BMP replacement, or a different BMP type will be required.

- The BMP is not drained between storm events. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the media layer, filter course, aggregate storage layer, underdrain, or outlet structure. The specific cause of the drainage issue must be determined and corrected.

- Sediment, trash, or debris accumulation greater than 25% of the surface ponding volume

within one month. This means the load from the tributary drainage area is too high, reducing BMP function or clogging the BMP. This would require pretreatment measures within the tributary area draining to the BMP to intercept the materials. Pretreatment components, especially for sediment, will extend the life of components that are more expensive to replace such as media, filter course, and aggregate layers.

- Erosion due to concentrated storm water runoff flow that is not readily corrected by adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.

Other Special Considerations. Biofiltration with partial retention is a vegetated structural BMP. Vegetated structural BMPs that are constructed in the vicinity of, or connected to, an existing jurisdictional water or wetland could inadvertently result in creation of expanded waters or wetlands. As such, vegetated structural BMPs have the potential to come under the jurisdiction of the United States Army Corps of Engineers, San Diego Water Board, California Department of Fish and Wildlife, or the United States Fish and Wildlife Service. This could result in the need for specific resource agency permits and costly mitigation to perform maintenance of the structural BMP. Along with proper placement of a structural BMP, routine maintenance is key to preventing this scenario.

Summary of Standard Inspection and Maintenance

The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district.

Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.

Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation or compaction of the media layer.	• Inspect monthly. If the BMP is 25% full* or more in one month, increase inspection frequency to monthly plus after every 0.1-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Obstructed inlet or outlet structure	Clear blockage.	• Inspect monthly and after every 0.5-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.	• Inspect annually. • Maintain when needed.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
Dead or diseased vegetation	Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.
Overgrown vegetation	Mow or trim as appropriate.	• Inspect monthly. • Maintain when needed.
2/3 of mulch has decomposed, or mulch has been removed	Remove decomposed fraction and top off with fresh mulch to a total depth of 3 inches.	• Inspect monthly. • Replenish mulch annually, or more frequently when needed based on inspection.
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.	• Inspect monthly. • Maintain when needed.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.	• Inspect after every 0.5-inch or larger storm event. If erosion due to storm water flow has been observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in BMP for longer than 24 hours following a storm event Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains, or repairing/replacing clogged or compacted soils.	• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
Presence of mosquitos/larvae For images of egg rafts, larva, pupa, and adult mosquitos, see http://www.mosquito.org/biology	If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water. If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria due to release rates controlled by an orifice installed on the underdrain, the City Engineer shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of Riverside Department of Environmental Health, may be required.	• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed.
Underdrain clogged	Clear blockage.	Inspect if standing water is observed for longer than 24-96 hours following a storm event. Maintain when needed.

E.25 FT-5 Proprietary Flow-Thru Treatment Control BMPs

The purpose of this fact sheet is to help explain the potential role of proprietary BMPs in meeting flow thru treatment control BMP requirements. The fact sheet does not describe design criteria like the other fact sheets in this appendix because this information varies by BMP product model.

Criteria for Use of a Proprietary BMP as a Flow-Thru Treatment Control BMP

A proprietary BMP may be acceptable as a "flow-thru treatment control BMP" under the following conditions:

(1) The BMP is selected and sized consistent with the method and criteria described in Appendix B.6;

(2) The BMP is designed and maintained in a manner consistent with its performance certifications (See explanation in Appendix B.6); and

(3) The BMP is acceptable at the discretion of the City Engineer. In determining the acceptability of a BMP, the City Engineer should consider, as applicable, (a) the data submitted; (b) representativeness of the data submitted; (c) consistency of the BMP performance claims with pollutant control objectives; certainty of the BMP performance claims; (d) for projects within the public right of way and/or public projects: 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; and (e) other relevant factors. If a proposed BMP is not accepted by the City Engineer, a written explanation/reason will be provided to the applicant.

Guidance for Sizing Proprietary BMPs

Proprietary flow-thru BMPs must meet the same sizing guidance as other flow-thru treatment control BMPs. Guidance for sizing flow-thru BMPs to comply with requirements of this manual is provided in Appendix B.6.

Maintenance Overview

Refer to manufacturer for maintenance information.

Attachment 1 f:

Structural BMP Inventory

Attachment 1f: Structural BMP Inventory

Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from WQMP)				
Description/Type of Structural BMP	**Plan Sheet #**	**BMP ID#**	**DMA ID No.**	**Revisions**
PR-1: Biofiltration with Partial Retention	**TBD**	**BMP-A**	**DMA - 1**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-B**	**DMA-2**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT1**	**DMA – 1 (Subarea:1A)**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT2**	**DMA – 1 (Subarea:2A)**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT4**	**DMA – 1 (Subarea:4A)**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT5**	**DMA – 1 (Subarea:5A)**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT7**	**DMA – 1 (Subarea:7A)**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT8**	**DMA – 1 (Subarea:8A)**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT9**	**DMA – 1 (Subarea:9A)**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT10**	**DMA – 1 (Subarea:10A)**	
FT-5: Proprietary Flow-Thru Treatment Control BMP	**TBD**	**BMP-PT11**	**DMA – 1 (Subarea:11A)**	

Attachment 1 g:

Structural Pollutant Control BMP Checklist

Attachment 1g: Structural Pollutant Control BMP Checklist

Provide the following items for each Structural BMP selected
Refer to Figure 5-2: *Stormwater Pollutant Control Structural BMP Selection Flow Chart*

☐ Not included because the entire project is designed with Self-Mitigating, De-Minimis, or Self-Retaining DMAs. The project is compliant with Pollution Control BMP sizing requirements.

DMA ID No.	1 (Onsite)	Structural BMP ID No.	BMP-A	Construction Plan Sheet No.	TBD

Geotechnical/ Soils Engineering Recommendations:

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

☐ Full Infiltration
☒ Partial Infiltration
☐ No Infiltration

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate

Design Infiltration rate: 0.193 (in/hr)

Structural BMP Selection and Design (Chapter 5.5) complete and include the applicable worksheet(s) found in appendix B (color coded Green below) and design criteria checklists from the associated fact sheets found in appendix E (color coded Orange below) for selected Structural BMP(s):

☐ Worksheet B.6-1 - 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)
☐ Retention by harvest and use (HU-1)
  ☐ Continuous simulation Model
☐ Worksheet B.4-1
  ☐ Infiltration basin (INF-1)
  ☐ Bioretention (INF-2)
  ☐ Permeable pavement (INF-3)
☒ Worksheet B.5-1
  ☒ Biofiltration with partial retention (PR-1)
  ☐ Biofiltration (BF-1)
    ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
  ☐ Proprietary Biofiltration (BF-3)
    ☐ Appendix F checklist
☐ Worksheet B.5-3 Minimum Footprint
☐ Worksheet B.5-4 Biofiltration + Storage
☒ Selected BMPs have been designed to address the entire DCV. The DMA is compliant with Pollution Control BMP sizing requirements. **STOP ***
☐ Other (describe in discussion section below)

☐ Worksheet B.6-1 - Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
- ☐ Describe in discussion section below why the remaining BMP size could not fit on site.
- ☐ Selection of Flow-Thru Treatment Control BMPs with high or medium effectiveness
  - ☐ Vegetated swales (FT-1)
  - ☐ Media Filters (FT-2)
  - ☐ Sand Filters (FT-3)
  - ☐ Dry Extended Detention Basin (FT-4)
  - ☐ Proprietary flow-thru treatment control (FT-5)
- ☐ Water Quality Equivalency Worksheets[20]

Purpose:
☐ Pre-treatment/forebay for another structural BMP
☐ Pollutant control only
☒ Combined pollutant control and hydromodification control (see Attachment 2)
☐ Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Chapter 1.12 of the BMP Design Manual)	TBD
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ City ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ City ☐ Other (describe)

Discussion (as needed):

All site drainage will be directed to the this BMP for stormwater treatment. Pretreatment will be provided for upstream catch basin/ inlets.

* If this box is checked, Worksheet B.6-1 does not need to be filled out.

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition	Worksheet C.4-1

Part 1 - Full Infiltration Feasibility Screening Criteria

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

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

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

Provide basis:

PRELIMINARY REVIEW- ADDITIONAL COORDINATION WITH PROJECTS GEOTECHNICAL CONSULTANT REQUIRED.

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

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

Provide basis:

PRELIMINARY REVIEW- ADDITIONAL COORDINATION WITH PROJECTS GEOTECHNICAL CONSULTANT REQUIRED.

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

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

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

Worksheet C.4-1 Page 3 of 4

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

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

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

Provide basis:

PRELIMINARY REVIEW- ADDITIONAL COORDINATION WITH PROJECTS GEOTECHNICAL CONSULTANT REQUIRED.

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

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

Provide basis:

PRELIMINARY REVIEW- ADDITIONAL COORDINATION WITH PROJECTS GEOTECHNICAL CONSULTANT REQUIRED.

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

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

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

PRELIMINARY REVIEW- ADDITIONAL COORDINATION WITH PROJECTS GEOTECHNICAL CONSULTANT REQUIRED.

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	3	0.75
		Predominant soil texture	0.25	3	0.75
		Site soil variability	0.25	3	0.75
		Depth to groundwater / impervious layer	0.25	3	0.75
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			3
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	1	0.25
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					3
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					0.5825
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					0.194
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: Infiltration testing was preformed and average of four boring percolation test was used for Observed Infiltration Rate on this form. See Geotechnical Engineering Investigation Report by Salem Engineering Group Dated 05-4-2022 for additional information on infiltration testing and results. Conservative factors used for the suitability assessment for the conceptual phase of this project. Additional coordination with project Geotechnical Engineer expected as project progresses.					

Automated Worksheet B.5-2: Sizing Specialized Biofiltration BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	DMA -1 (Onsite)	-	-	-	-	-	-	-	-	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.193	-	-	-	-	-	-	-	-	-	in/hr
	2	Effective Tributary Area	167,931	-	-	-	-	-	-	-	-	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	-	-	-	-	-	-	-	-	-	-	ratio
	4	Design Capture Volume Tributary to BMP	13,994	-	-	-	-	-	-	-	-	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Unlined										yes/no
	6	Provided Biofiltration BMP Surface Area	5,200										sq-ft
	7	Provided Surface Ponding Depth	3										inches
	8	Provided Soil Media Thickness	18										inches
	9	Provided Depth of Gravel Above Underdrain Invert	3										inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	4.00										inches
	11	Provided Depth of Gravel Below the Underdrain	3										inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	502	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	15	Effective Retention Depth	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	12	0	0	0	0	0	0	0	0	0	hours
	17	Volume Retained by BMP	1,412	0	0	0	0	0	0	0	0	0	cubic-feet
	18	Fraction of DCV Retained	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	11,475	0	0	0	0	0	0	0	0	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.5689	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	4.73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	4.73	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	28.36	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	7.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	29	Drawdown Time for Surface Ponding	1	0	0	0	0	0	0	0	0	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	2	0	0	0	0	0	0	0	0	0	hours
	31	Total Depth Biofiltered	36.16	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	17,213	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	15,669	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	8,606	0	0	0	0	0	0	0	0	0	cubic-feet
	35	Option 2 - Provided Storage Volume	3,380	0	0	0	0	0	0	0	0	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	#N/A	-	-	-	-	-	-	-	-	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	**Deficit of Effectively Treated Stormwater**	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-2 General Notes:

A. Applicants may use this worksheet to size lined or unlined Specialized Biofiltration BMPs (BF-3) for up to 10 basins. Note that applicants proposing specialized biofiltration BMPs must satisfy minimum annual retention criteria and provide documentation demonstrating compliance with all Appendix F criteria. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Attachment 1g: Structural Pollutant Control BMP Checklist

Provide the following items for each Structural BMP selected
Refer to Figure 5-2: *Stormwater Pollutant Control Structural BMP Selection Flow Chart*

☐ Not included because the entire project is designed with Self-Mitigating, De-Minimis, or Self-Retaining DMAs. The project is compliant with Pollution Control BMP sizing requirements.

DMA ID No. 1A, 2A, 4A, 5A, 7A, 8A,9A 10A and 11A | Structural BMP ID No. PT1, PT2, PT4, PT5, PT7, PT8, PT9 PT10, & PT11 | Construction Plan Sheet No. TBD

Geotechnical/ Soils Engineering Recommendations:

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

- ☐ Full Infiltration
- ☐ Partial Infiltration
- ☐ No Infiltration

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate

Design Infiltration rate: 0.193 (in/hr)

Structural BMP Selection and Design (Chapter 5.5) complete and include the applicable worksheet(s) found in appendix B (color coded Green below) and design criteria checklists from the associated fact sheets found in appendix E (color coded Orange below) for selected Structural BMP(s):

- ☒ Worksheet B.6-1 - 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)
- ☐ Retention by harvest and use (HU-1)
  - ☐ Continuous simulation Model
- ☐ Worksheet B.4-1
  - ☐ Infiltration basin (INF-1)
  - ☐ Bioretention (INF-2)
  - ☐ Permeable pavement (INF-3)
- ☐ Worksheet B.5-1
  - ☐ Biofiltration with partial retention (PR-1)
  - ☐ Biofiltration (BF-1)
    - ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
  - ☐ Proprietary Biofiltration (BF-3)
    - ☐ Appendix F checklist
- ☐ Worksheet B.5-3 Minimum Footprint
- ☐ Worksheet B.5-4 Biofiltration + Storage
- ☐ Selected BMPs have been designed to address the entire DCV. The DMA is compliant with Pollution Control BMP sizing requirements. **STOP ***
- ☐ Other (describe in discussion section below)

☐ Worksheet B.6-1 - Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
- ☐ Describe in discussion section below why the remaining BMP size could not fit on site.
- ☐ Selection of Flow-Thru Treatment Control BMPs with high or medium effectiveness
  - ☐ Vegetated swales (FT-1)
  - ☐ Media Filters (FT-2)
  - ☐ Sand Filters (FT-3)
  - ☐ Dry Extended Detention Basin (FT-4)
  - ☐ Proprietary flow-thru treatment control (FT-5)
- ☐ Water Quality Equivalency Worksheets[20]

Purpose:
☒ Pre-treatment/forebay for another structural BMP
☐ Pollutant control only
☐ Combined pollutant control and hydromodification control (see Attachment 2)
☐ Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Chapter 1.12 of the BMP Design Manual)	TBD
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ City ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ City ☐ Other (describe)

Discussion (as needed):

BMPs :(PT1, PT2, PT4, PT5, PT7, PT8, PT9 PT10, & PT11) are catch basin filters used as pretreatment for the proposed onsite PR-1: Biofiltration w/partial Retention (BMP-A). The catch basin filters preliminary proposed is a LittaTrap Full Capture by Enviropod (or approved equal).

* If this box is checked, Worksheet B.6-1 does not need to be filled out.

Automated Worksheet B.6-1: Sizing Flow-Thru BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	1A	2A	4A	5A	7A	8A	9A	10A	11A	-	unitless
	1	Final Effective Tributary Area	17,670	10,428	7,308	5,456	5,131	9,017	14,354	12,355	11,975	-	sq-ft
	2	Final Adjusted Runoff Factor	0.78	0.77	0.72	0.67	0.53	0.77	0.77	0.71	0.85	-	unitless
	3	Final Design Capture Volume Tributary to BMP	1,473	869	609	455	428	751	1,196	1,030	998	-	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	0	0	0	0	0	0	0	0	0	-	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	-1,473	-869	-609	-455	-428	-751	-1,196	-1,030	-998	-	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP	7.670	7.670	7.670	7.670	7.670	7.670	7.670	7.670	7.670		CFS
Flow Rate Calculations	7	Adjustment Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	-	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	0.081	0.048	0.034	0.025	0.024	0.041	0.066	0.057	0.055	-	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	unitless

Worksheet B.6-1 General Notes:

A. Applicants may use this worksheet to size flow-thru BMPs (FT-1 through FT-5) for up to 10 basins. Note that applicants proposing flow-thru BMPs must provide supplemental documentation to support the maximum water quality flow rate referenced above, demonstrate medium to high pollutant removal efficiency for project's most significant pollutants of concern, and must also implement an offsite alternative compliance project to offset the deficit of effectively treated stormwater volume. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below.

LittaTrap™ Full Capture

ENVIROPOD.COM

Certified Full Trash Capture Device by California State Water Board

- **LEADING CATCH BASIN INSERT**
- **ENVIROPOD™ HAS OVER 25 YEARS OF DEVELOPING AT-SOURCE TREATMENT**
- **OVER 50,000 ENVIROPOD™ INSTALLATIONS WORLDWIDE**
- **THE LITTATRAP™ FC MODEL IS DESIGNED TO MEET THE REQUIREMENTS OF THE CALIFORNIA STATE WATER BOARD**

Backed by over 25 years of research and design, the EnviroPod™ LittaTrap™ Full Capture (FC) is the world's leading catch basin insert to meet water quality objectives and regulations.

The intuitive and adaptive design allows easy install and operation in all forms of stormwater catch basin infrastructure. The design maximizes hydraulic conductivity and storage volume.

- **EASY INSTALLATION** with fewer parts and a lighter frame, the installation process is quicker and saves you time on site
- **FLEXIBILITY** The flexible design allows the system to be easily adjusted to fit any catch basin configurations
- **HINGED VECTOR PORT SEAL** MVCAC verified for full visual access under the trap with the basin grate on or off
- **SEAL AND ADAPTOR KITS** for irregular sized and manhole catchbasins
- **HAND MAINTENANCE** The LittaTrap™ FC can be maintained quickly and easily by hand or by vacuum truck
- **THIRD PARTY TESTED** and hydraulically engineered
- **LIGHTWEIGHT & DURABLE** The lightweight yet durable design of the LittaTrap™ FC is a safer and a longer lasting product than the alternatives
- **CURB INLET AND GRATE INLET** Design options available, contact us to start your project today

8 YEAR WARRANTY ON STATIC PARTS

Our technical guide is available for more detail on hydraulic performance, head loss, treatment and scour testing at **www.enviropod.com**

ENVIROPOD™
A STORMWATER360™ COMPANY

Certified Full Trash Capture Device by California State Water Board

EASY MAINTENANCE

Maintenance is a simple process that requires no confined space entry. Maintenance can be quickly undertaken using a vacuum truck or it can be maintained manually by hand.

1 Lift

Lift the LittaTrap™ FC out of the catch basin using the LIFT handles

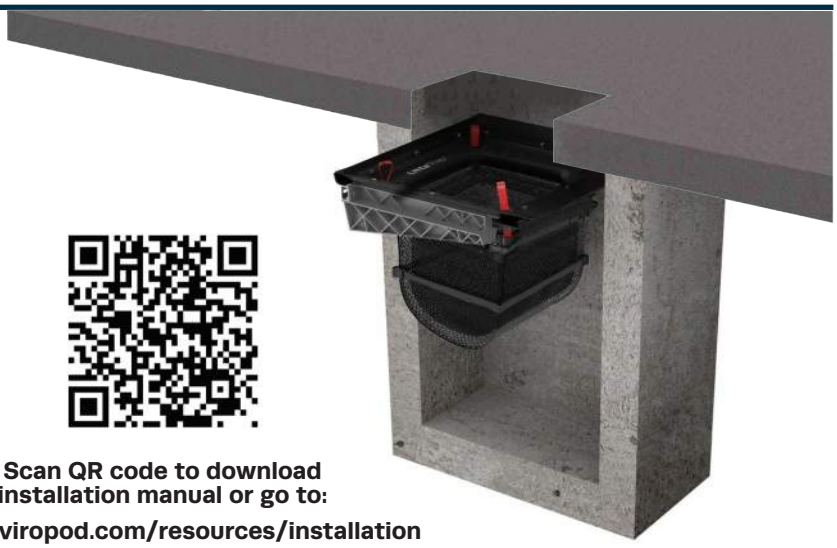
2 Tip

Tip the contents out of LittaTrap™ FC into suitable receptacle for contents

3 Reuse

Reuse the LittaTrap™ FC by placing securely back into the surrounding frame and seal, and close grate.

INSTALLATION – CURB INLET AND GRATE INLET



Scan QR code to download installation manual or go to:

www.enviropod.com/resources/installation

EnviroPod™ LittaTrap™ FC Models And Sizes

Nominal Catch Basin Size (inch)	LittaTrap™ FC Model Size	Bracket Width (inch)	Min Filter Box Size (Without Seals)		Max Filter Box Size (Without Seals)		Basket Collar Size		Basket Depth
			Length	Width	Length	Width	Length	Width	inch
18" x 18"	LTFC4545	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.7
24" x 24"	LTFC6060	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.7
36" x 24"	LTFC9060	34.3	32.0	17.6	37.1	22.7	920	17.3	15.7

Attachment 1g: Structural Pollutant Control BMP Checklist

Provide the following items for each Structural BMP selected
Refer to Figure 5-2: *Stormwater Pollutant Control Structural BMP Selection Flow Chart*

☐ Not included because the entire project is designed with Self-Mitigating, De-Minimis, or Self-Retaining DMAs. The project is compliant with Pollution Control BMP sizing requirements.

DMA ID No. 2 | Structural BMP ID No. B | Construction Plan Sheet No. TBD

Geotechnical/ Soils Engineering Recommendations:

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

☐ Full Infiltration
☐ Partial Infiltration
☐ No Infiltration

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate

Design Infiltration rate: 0.193 (in/hr)

Structural BMP Selection and Design (Chapter 5.5) complete and include the applicable worksheet(s) found in appendix B (color coded Green below) and design criteria checklists from the associated fact sheets found in appendix E (color coded Orange below) for selected Structural BMP(s):

☒ Worksheet B.6-1 - 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)

☐ Retention by harvest and use (HU-1)
  ☐ Continuous simulation Model

☐ Worksheet B.4-1
  ☐ Infiltration basin (INF-1)
  ☐ Bioretention (INF-2)
  ☐ Permeable pavement (INF-3)

☐ Worksheet B.5-1
  ☐ Biofiltration with partial retention (PR-1)
  ☐ Biofiltration (BF-1)
    ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
  ☐ Proprietary Biofiltration (BF-3)
    ☐ Appendix F checklist

☐ Worksheet B.5-3 Minimum Footprint

☐ Worksheet B.5-4 Biofiltration + Storage

☐ Selected BMPs have been designed to address the entire DCV. The DMA is compliant with Pollution Control BMP sizing requirements. **STOP ***

☐ Other (describe in discussion section below)

☐ Worksheet B.6-1 - Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
- ☐ Describe in discussion section below why the remaining BMP size could not fit on site.
- ☐ Selection of Flow-Thru Treatment Control BMPs with high or medium effectiveness
  - ☐ Vegetated swales (FT-1)
  - ☐ Media Filters (FT-2)
  - ☐ Sand Filters (FT-3)
  - ☐ Dry Extended Detention Basin (FT-4)
  - ☐ Proprietary flow-thru treatment control (FT-5)
- ☐ Water Quality Equivalency Worksheets[20]

Purpose:
☐ Pre-treatment/forebay for another structural BMP
☒ Pollutant control only
☐ Combined pollutant control and hydromodification control (see Attachment 2)
☐ Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Chapter 1.12 of the BMP Design Manual)	TBD
Who will be the final owner of this BMP?	☐ HOA ☐ Property Owner ☒ City ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☐ Property Owner ☒ City ☐ Other (describe)

Discussion (as needed):

BMP-B is a catch basin filter (Enviropod, Flowguard, or equivalent Filters), employed for treating the Design Capture Volume (DCV). DMA-2, situated within the public Right-of-Way (ROW), necessitates treatment due to the replacement/redevelopment and establishment of new impervious areas for the proposed street improvements along Winchester Rd, adjacent to the project site. An Alternative Compliance program is in the planning stages for the offsite segment of the project. Refer to the Water Quality Equivalency and Alternative Compliance report/calculations for additional comprehensive details.

* If this box is checked, Worksheet B.6-1 does not need to be filled out.

Automated Worksheet B.6-1: Sizing Flow-Thru BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Flow-Thru BMP Inputs	0	Drainage Basin ID or Name	-	DMA-2 (Offsite)	-	-	-	-	-	-	-	-	unitless
	1	Final Effective Tributary Area	-	26,318	-	-	-	-	-	-	-	-	sq-ft
	2	Final Adjusted Runoff Factor	-	0.82	-	-	-	-	-	-	-	-	unitless
	3	Final Design Capture Volume Tributary to BMP	-	2,193	-	-	-	-	-	-	-	-	cubic-feet
	4	Volume Effectively Retained and/or Biofiltered	-	0	-	-	-	-	-	-	-	-	cubic-feet
	5	Deficit of Effectively Treated Stormwater Requiring Flow-Thru Treatment	-	-2,193	-	-	-	-	-	-	-	-	cubic-feet
	6	Maximum Rated Water Quality Flow Rate of Proposed BMP		0.126									CFS
Flow Rate Calculations	7	Adjustment Factor	-	1.00	-	-	-	-	-	-	-	-	unitless
	8	Design Rainfall Intensity for Flow-Thru BMPs	-	0.20	-	-	-	-	-	-	-	-	in/hr
	9	Water Quality Flow Rate Requiring Flow-Thru Treatment	-	0.121	-	-	-	-	-	-	-	-	CFS
Result	10	Is Flow-Thru BMP Adequately Sized?	-	Yes	-	-	-	-	-	-	-	-	unitless

Worksheet B.6-1 General Notes:

A. Applicants may use this worksheet to size flow-thru BMPs (FT-1 through FT-5) for up to 10 basins. Note that applicants proposing flow-thru BMPs must provide supplemental documentation to support the maximum water quality flow rate referenced above, demonstrate medium to high pollutant removal efficiency for project's most significant pollutants of concern, and must also implement an offsite alternative compliance project to offset the deficit of effectively treated stormwater volume. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below.

LittaTrap™ Full Capture

ENVIROPOD.COM

Certified Full Trash Capture Device by California State Water Board

- **LEADING CATCH BASIN INSERT**
- **ENVIROPOD™ HAS OVER 25 YEARS OF DEVELOPING AT-SOURCE TREATMENT**
- **OVER 50,000 ENVIROPOD™ INSTALLATIONS WORLDWIDE**
- **THE LITTATRAP™ FC MODEL IS DESIGNED TO MEET THE REQUIREMENTS OF THE CALIFORNIA STATE WATER BOARD**

Backed by over 25 years of research and design, the EnviroPod™ LittaTrap™ Full Capture (FC) is the world's leading catch basin insert to meet water quality objectives and regulations.

The intuitive and adaptive design allows easy install and operation in all forms of stormwater catch basin infrastructure. The design maximizes hydraulic conductivity and storage volume.

- **EASY INSTALLATION** with fewer parts and a lighter frame, the installation process is quicker and saves you time on site
- **FLEXIBILITY** The flexible design allows the system to be easily adjusted to fit any catch basin configurations
- **HINGED VECTOR PORT SEAL** MVCAC verified for full visual access under the trap with the basin grate on or off
- **SEAL AND ADAPTOR KITS** for irregular sized and manhole catchbasins
- **HAND MAINTENANCE** The LittaTrap™ FC can be maintained quickly and easily by hand or by vacuum truck
- **THIRD PARTY TESTED** and hydraulically engineered
- **LIGHTWEIGHT & DURABLE** The lightweight yet durable design of the LittaTrap™ FC is a safer and a longer lasting product than the alternatives
- **CURB INLET AND GRATE INLET** Design options available, contact us to start your project today

8 YEAR WARRANTY ON STATIC PARTS

Our technical guide is available for more detail on hydraulic performance, head loss, treatment and scour testing at **www.enviropod.com**

ENVIROPOD™
A STORMWATER360™ COMPANY

Certified Full Trash Capture Device by California State Water Board

EASY MAINTENANCE

Maintenance is a simple process that requires no confined space entry. Maintenance can be quickly undertaken using a vacuum truck or it can be maintained manually by hand.

1 Lift

Lift the LittaTrap™ FC out of the catch basin using the LIFT handles

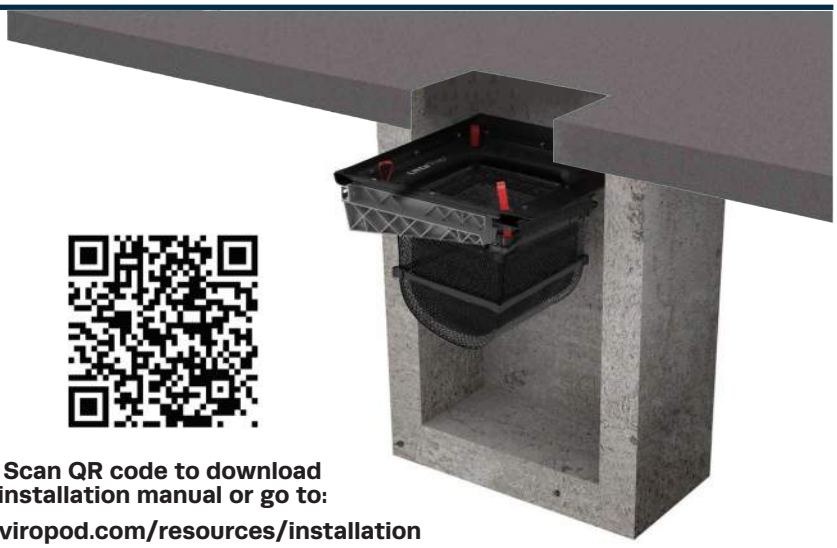
2 Tip

Tip the contents out of LittaTrap™ FC into suitable receptacle for contents

3 Reuse

Reuse the LittaTrap™ FC by placing securely back into the surrounding frame and seal, and close grate.

INSTALLATION – CURB INLET AND GRATE INLET



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36" x 24"	LTFC9060	34.3	32.0	17.6	37.1	22.7	920	17.3	15.7

Attachment 1i: Offsite Alternative Compliance Participation Form - Pollutant Control

Refer to Chapter 1.8

Onsite Project Information					
Record ID:					
Assessor's Parcel Number(s) [APN(s)]					
Quantity of Pollutant Control Debits or Credits (cubic feet) ☐ Debits ☐ Credits *See Attachment 1 of the PDP WQMP					
Land Use Designation					
Agriculture			Rural Residential		
Commercial			Single Family Residential		
Education			Transportation		
Industrial			Vacant / Open Space		
Multi Family Residential			Water		
Orchard			**Total**		

Offsite Project Information – Projects providing or receiving credits *(add rows as needed)*					
	Record ID:	APN(s)	Project Owner/Address	Credit/Debit	Quantity (cubic feet)
1.				☐ Credit ☐ Debit	
2.				☐ Credit ☐ Debit	
3.				☐ Credit ☐ Debit	
Total sum of Credits and Debits (∑Credits -∑Debits) (cubic feet)					

Additional Information	
Are offsite project(s) in the same credit trading area as the onsite project?	☐ Yes ☐ No
Will projects providing credits be completed prior to completion of projects receiving credits?	☐ Yes ☐ No
Are all deficits accounted for? If No, onsite and offsite projects must be redesigned to account for all deficits.	☐ Yes ☐ No

Provide Alternative Compliance In-Lieu Fee Agreement and supporting WQE calculations as part of this attachment.

ATTACHMENT 2

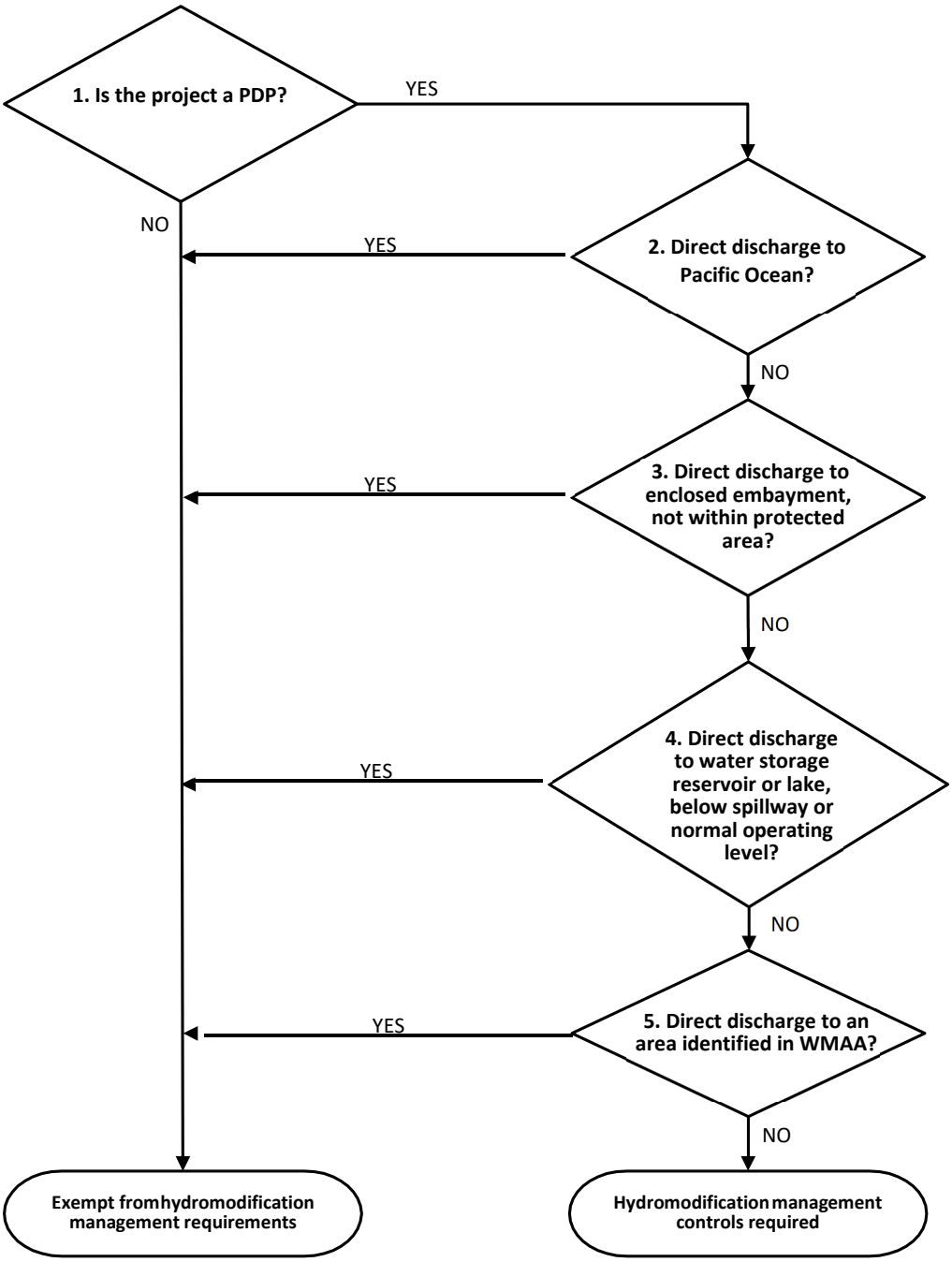
HYDROMODIFICATION CONTROL MEASURES

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 2a	Do Hydromodification Management Requirements apply? See Chapter 1.6 and Figure 1-2.	☐ Green Streets Project (Exempt from hydromodification management requirements) **STOP *** ☐ Exempt from hydromodification management requirements. Include Figure 1-2 and document any "YES" answer **STOP *** ☐ Hydromodification management controls required.
Attachment 2b	HMP Exhibits (Required) See Checklist on the back of this Attachment cover sheet. *see Chapter 6.3.1*	☐ Combined with DMA Exhibit ☐ Included
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Chapter 6.2 and Appendix H of the BMP Design Manual.	☐ Exhibit depicting onsite/ upstream CCSYAs (Figure H.1-1) AND, documentation that project avoids CCSYA per Appendix H.1. OR ☐ Sediment Supply BMPs implemented.
Attachment 2d	Structural BMP Design Calculations, Drawdown Calculations, & Overflow Design. See Chapter 6 & Appendix G of the BMP Design Manual	☐ Included ☐ Project is designed entirely with De-Minimus, Self–Mitigating, and/or qualifying Self-Retaining Areas. **STOP ***
Attachment 2e	Geomorphic Assessment of Receiving Channels. See Chapter 6.3.4 of the BMP Design Manual.	☐ low flow threshold is 0.1Q2 ☐ low flow threshold is 0.3Q2 ☐ low flow threshold is 0.5Q2
Attachment 2f	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☐ Not required because BMPs will drain in less than 96 hours
Attachment 2g	Hydromodification Offsite Alternative Compliance form. Refer to Figure 1-3: Pathways to Participating in Offsite Alternative Compliance Program	☐ Full Compliance Onsite ☐ Offsite ACP. Document onsite structural BMPs and complete Hydromodification Offsite Alternative Compliance Participation Form, and WQE worksheets

* If this box is checked, the remainder of Attachment 2 does not need to be filled out.

Attachment 2a: Applicability of Hydromodification Management BMP Requirements



Attachment 2b: DMA Exhibit Checklist

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

☐ Point(s) of Compliance with name or number
☐ Project Site Boundary
☐ Project Disturbed Area Footprint
☐ Drainage management area (DMA) boundaries, DMA ID numbers, DMA areas (square footage or acreage), and DMA type (i.e., drains to structural BMP, self-retaining, self-mitigating, or de-minimis) Note on exhibit De-minimis areas and reason they could not be included. Include offsite areas receiving treatment to mitigate Onsite Water Quality Equivalency.
☐ Potential pollutant source areas and corresponding required source control BMPs (see Chapter 4, Appendix E.1, and Step 3.5)
☐ Proposed Site Design BMPs and surface treatments used to minimize imperviousness. Show sections, details, and dimensions of site design BMP's (tree wells, dispersion areas, rain gardens, permeable pavement, rain barrels, green roofs, etc.)
☐ Proposed Harvest and Use BMPs
☐ Underlying hydrologic soil group (Web Soil Survey)
☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands, pond, lake)
☐ Existing topography and impervious areas
☐ Proposed grading and impervious areas. If the project is a subdivision or spans multiple lots show pervious and impervious totals for each lot.
☐ Existing and proposed site drainage network and connections to drainage offsite
☐ Potable water wells, onsite wastewater treatment systems (septic), underground utilities
☐ Structural BMPs (identify location, structural BMP ID No., type of BMP, and size/detail)
☐ Approximate depth to groundwater at each structural BMP
☐ Approximate infiltration rate and feasibility (full retention, partial retention, biofiltration) at each structural BMP
☐ Critical coarse sediment yield areas to be protected and or conveyed through the project site.
☐ Temporary Construction BMPs. Include protection of source control, site design and structural BMPs during construction.

☐ Onsite and Offsite Critical coarse sediment yield areas to be protected
☐ Proposed design features and surface treatments used to minimize imperviousness
☐ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☐ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

Attachment 2c: Management of Critical Coarse Sediment Yield Areas

Document the findings of Site-specific Critical Coarse Sediment Analysis below. Include any calculations, and additional documentation completed as part of the analysis. Refer to Chapter 6.2 and Appendix H of the City of Temecula BMP Design Manual for additional guidance.

The project effectively manages Critical Coarse Sediment Yield Areas (CCSYAs) using the following methodology:

☐ **Step A.** A Site-Specific Critical Coarse Sediment Yield Analysis was performed:

☐ **Step A.1.** Determine whether the project site is a significant source of critical coarse sediment to the channel receiving runoff (refer to CCSYA mapping in Appendix H):

☐ The project site is a significant source of Bed Sediment Supply. All channels on the project site are preserved or bypassed within the site plan. *(Complete Step A.2, below)*

☐ The project site is a source of Bed Sediment Supply. Channels identified as verified critical coarse sediment yield areas are preserved. *(Complete Step A.2, below)*

☐ The Project site is not a significant source of Bed Sediment Supply. ***(STOP, supporting information provided with this checklist)***

☐ Impacts to verified CCSYAs cannot be avoided. *(Complete Step B, below)*

☐ **Step A.2.** Project site design avoids CCSYAs and maintains sediment supply pathways, documentation is provided following this checklist. (***STOP,*** *include supporting documentation with this checklist)*

☐ **Step B.** Sediment Supply BMPs are implemented onsite to mitigate impacts of development in CCSYAs, documentation is provided following this checklist. *(**STOP,** include supporting documentation with this checklist)*

Hydromodification Offsite Alternative Compliance Participation Form

Refer to Chapter 1.8

Onsite Project Information					
Record ID:					
Assessor's Parcel Number(s) [APN(s)]					
Quantity of Hydromodification Debits or Credits (DCIA) ☐ Debits ☐ Credits *See Attachment 1 of the PDP WQMP					
Offsite Project Information – Projects providing or receiving credits *(add rows as needed)*					
	Record ID:	APN(s)	Project Owner/Address	Credit/Debit	Quantity (DCIA)
1.				☐ Credit ☐ Debit	
2.				☐ Credit ☐ Debit	
3.				☐ Credit ☐ Debit	
4.				☐ Credit ☐ Debit	
5.				☐ Credit ☐ Debit	
6.				☐ Credit ☐ Debit	
Total sum of Credits and Debits (∑Credits -∑Debits) (DCIA)					
Additional Information					
Are offsite projects in the same credit trading area as the onsite project?					☐ Yes ☐ No
Do offsite projects discharge directly to the same susceptible stream reach as the onsite project? (required for certain hydromodification scenarios)					☐ Yes ☐ No
Will projects providing credits be completed prior to completion of projects receiving credits?					☐ Yes ☐ No
Are all deficits accounted for? If No, onsite and offsite projects must be redesigned to account for all deficits.					☐ Yes ☐ No

Provide supporting WQE calculations as part of this attachment.

CHECKLIST 1

Checklist of Items to Include on Plan Sheets Showing Permanent Stormwater BMPs, Source Control, and Site Design

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

The plans must identify:

☒ Structural BMP(s) with ID numbers
☒ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☐ Improvements within City Public Right-of-Way have been designed in accordance with Appendix K: Guidance on Green Infrastructure.
☒ Details and specifications for construction of structural BMP(s).
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable.
☐ Signage indicating the location and boundary of source control, site design, and structural BMP(s) as required by City staff.
☒ How to access the structural BMP(s) to inspect and perform maintenance.
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, benchmarks or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☒ Include landscaping plan sheets showing vegetation and amended soil requirements for vegetated structural BMP(s), amended soil areas, dispersion areas, tree-wells, and self-mitigating areas
☒ All BMPs must be fully dimensioned on the plans
☒ Include all Construction stormwater, source control, and site design measures described in the WQMP. Can be included as separate plan sheets as necessary.
☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.

CHECKLIST 2

Checklist for Hydrology/Hydraulic Analysis

Use this checklist to ensure the required information has been included on the Hydrology/Hydraulic Analysis :

☒ The project is subject to the requirements of City of Temecula Construction, Grading, and Encroachment Ordinance Section 18.06.020 and requires a grading permit and Hydrology Hydraulic Analysis. **Prepare Hydrology/Hydraulic Analysis and include all elements of checklist below.**

☐ The project is exempt from grading permit requirements of City of Temecula Construction, Grading, and Encroachment Ordinance per Section 18.06.060. Document the project exempt category and justification and **STOP**.

Grading Exemption Category (A-O):_____
Discussion/Justification of Exemption:

Hydrology/Hydraulic Analysis. The engineer of record shall prepare and submit studies and data regarding hydrology/hydraulic analysis and calculations for ten (10) and one hundred (100) year storm events per Riverside County Flood Control & Water Conservation District Hydrology Manual. Drainage area maps shall also be submitted to determine the quantity of runoff generated by or tributary to the site, and its effects on the site or upon upstream or downstream properties.

the study shall include the following but not limited to:

☒ In the narrative of the report please provide a summary table of pre- and post- development C, Tc, I, A, V100, Q100 without mitigation and Q100 with mitigation for each area (or point) where drainage discharges from the project. Peak runoff rates (cfs), velocities (fps) and identification of all erosive velocities (at all points of discharge) calculations for pre-development and post-development. The comparisons should be made about the same discharge points for each drainage basin affecting the site and adjacent properties.

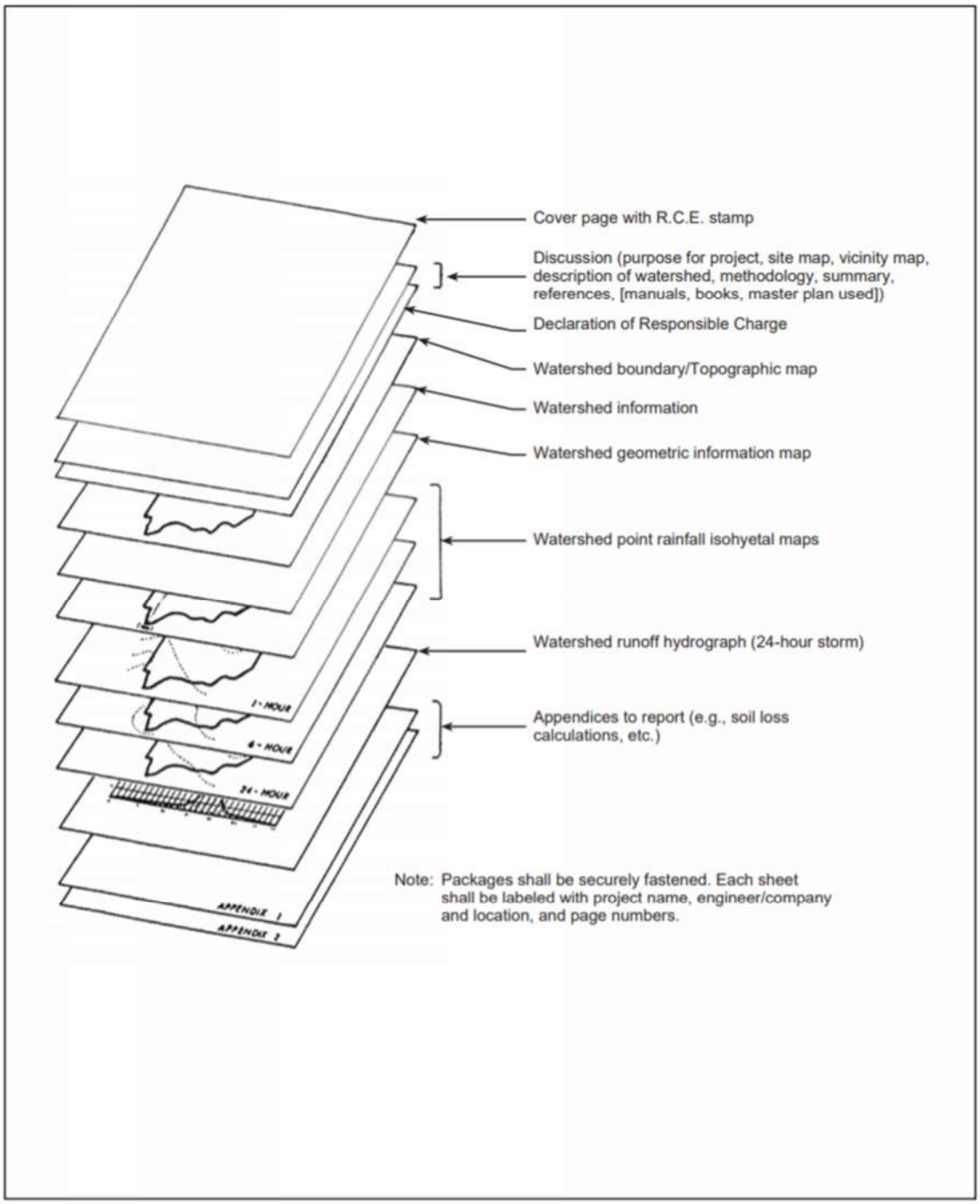
☒ Summary/Conclusion: Please discuss whether the proposed project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? Provide reasons and mitigations proposed.☐ Provide existing and proposed Hydrology Maps for each phase. The maps shall show existing and proposed culverts, discharge point with A & Q, flow path direction for each drainage basin. Show existing FEMA floodplain/floodway which flow through the property. A minimum map size is 11"x17".

☒ Provide Hydrologic Soil Group Map.
☒ Provide Rainfall Isopluvials for 100 Year Rainfall Event - 6 Hours and 24 Hours Maps.
☒ The report should have numbered pages and a corresponding Table of Contents.
☐ Improvements within City Public Right-of-Way have been designed in accordance with Appendix K: Guidance on Green Infrastructure.
☒ BMP's have been designed to safely convey the 100-year flood
☐ Limits of Inundation. Said limits on the property, during specified storm frequencies, shall be delineated on the plans; supporting calculations shall also be required.

☒ Flood Protection. The engineer of record responsible for plan preparation shall ensure:

a. That the building pads to be created through any proposed grading are free from inundation from runoff from specified storms; and

b. That floodplain/floodway elevations and widths, sheet flow depths and any other data required by the City Engineer (or by any applicable County, State or Federal flood protection insurance program/requirements) are delineated on the plans.



CHECKLIST 3

Checklist for Geotechnical and Groundwater Investigation Report

The report must address the following key elements, and where appropriate, mitigation recommendations must be provided.

☐ Identify areas of the project site where infiltration is likely to be feasible and provide justifications for selection of those areas based on soil types, slopes, proximity to existing features, etc. Include completed and signed Worksheet C.4-1.

☒ Investigate, evaluate and estimate the vertical infiltration rates and capacities in accordance with the guidance provided in Appendix D which describes infiltration testing and appropriate factor of safety to be applied for infiltration testing results. The site may be broken into sub-basins, each of which has different infiltration rates or capacities.

☐ Describe the infiltration/ percolation test results and correlation with published infiltration/ percolation rates based on soil parameters or classification. Recommend providing design infiltration/percolation rate(s) at the sub-basins. Include completed and signed Worksheet D.5-1.

☒ Investigate the subsurface geological conditions and geotechnical conditions that would affect infiltration or migration of water toward structures, slopes, utilities, or other features. Describe the anticipated flow path of infiltrated water. Indicate if the water will flow into pavement sections, utility trench bedding, wall drains, foundation drains, or other permeable improvements.

☒ Investigate depth to groundwater and the nature of the groundwater. Include an estimate of the high seasonal groundwater elevations.

☒ Evaluate proposed use of the site (industrial use, residential use, etc.), soil and groundwater data and provide a concluding opinion whether proposed storm water infiltration could cause adverse impacts to groundwater quality and if it does cause impacts whether the impacts could be reasonably mitigated or not.

☒ Estimate the maximum allowable infiltration rates and volumes that could occur at the site that would avoid damage to existing and proposed structures, utilities, slopes, or other features. In addition the report must indicate if the recommended infiltration rate is appropriate based on the conditions exposed during construction.

☒ Provide a concluding opinion regarding whether or not the proposed onsite storm water infiltration/percolation BMP will result in soil piping, daylight water seepage, slope instability, or ground settlement.

☒ Recommend measures to substantially mitigate or avoid any potentially detrimental effects of the storm water infiltration BMPs or associated soil response on existing or proposed improvements or structures, utilities, slopes or other features within and adjacent to the site. For example, minimize soil compaction.

☒ Provide guidance for the selection and location of infiltration BMPs, including the minimum separations between such infiltration BMPs and structures, streets, utilities, manufactured and existing slopes, engineered fills, utilities or other features. Include guidance for measures that

could be used to reduce the minimum separations or to mitigate the potential impacts of infiltration BMPs.