

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS



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DEFINITIONS

100,000 Square Foot Commercial Development - means any commercial development that creates or redevelops 100,000 square feet or more of impermeable surfaces, including parking areas.

Automotive Repair Shop - means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

Best Management Practices (BMPs) – means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater conveyance systems or receiving waters. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Development - means any activity that moves soils or substantially alters the pre-existing vegetated or man-made cover of any land. This includes, but is not limited to: grading, digging, cutting, scraping, stockpiling or excavating of soil, placement of fill materials, paving, pavement removal, exterior construction, substantial removal of vegetation where soils are disturbed. Vegetation removal includes, but not limited to, the removal by clearing or grubbing, activities which bares soil or rock, involves streambed alterations, or the diversion or piping of any watercourse. Development does not include routine maintenance to: maintain original line and grade, hydraulic capacity, the original purpose of the facility, or emergency construction activities (i.e., land disturbances) required to protect public health and safety.

Directly Connected Impervious Area (DCIA) - means the area covered by a building, impermeable pavement, or other impervious surfaces which drains directly into the stormwater conveyance system without first flowing across permeable vegetated land area (e.g., lawns).

Director –means the Director of Public Works.

Hillside - means property located in an area with known erosive soil conditions, where the development proposes earth disturbance on any natural slope that is thirty (30) percent or greater.

Impervious Surface – means any material that prevents or substantially reduces infiltration of water into the soil. Examples of impervious surfaces include, but are not limited to: roofs, driveways, roads (paved or unpaved), sidewalks, and tennis courts.

Industrial General Permit: means the NPDES permit issued by the State Water Resources Control Board for the discharge of storm water associated with industrial activity.

Infiltration - means the downward entry of water into the surface of the soil.

Material Storage Areas: means on site locations where raw materials, products, final products, byproducts, or waste materials are stored.

Maximum Extent Practicable (MEP) - means the technology-based standard established by Congress in the Clean Water Act 402(p)(3)(B)(iii) for stormwater discharges that municipalities must meet. MEP is generally the result of emphasizing pollution prevention and source control best management practices (BMPs) primarily (as a first line of defense) and in combination with treatment methods serving as backup (additional line of defense). The MEP approach is an ever evolving, flexible and advanced concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does what constitutes MEP.

National Pollutant Discharge Elimination System (NPDES) Permit: An authorization, license, or equivalent control document issued by EPA or an approved State agency to implement the requirements of the NPDES program.

Offsite Facility - An offsite facility is a geographically non-adjacent or discontinuous site that serves, or is secondary to, the primary facility and has the same owner as the primary facility. Stormwater discharges

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from an offsite facility must be permitted if it meets the definition of a construction site. The offsite facility may satisfy this permitting requirement if the SWMP of the primary facility addresses the offsite facility, such that the permitted area of the primary facility includes the offsite area.

Parking Lot - means land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or commerce with a lot size of 5,000 square feet or more, or with 25 or more parking spaces.

Pollutants of Concern - For the purposes of identifying pollutants of concern and associated stormwater BMPs, pollutants are grouped in nine general categories as follows:

1. **Sediments** - are soils or other sacrificial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
2. **Nutrients** - are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in runoff are fertilizers, vegetative matter, and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
3. **Metals** - are elemental components of materials such as fuels, adhesives, paints, and other coatings. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. High concentrations of these metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns of the release of metals to the environment have led to restricted metal usage in certain applications.
4. **Organic Compounds** - are carbon-based compounds found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health.
5. **Trash & Debris** - Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash & debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.
6. **Oxygen-Demanding Substances** - This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.
7. **Oil and Grease** - are high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.
8. **Bacteria and Viruses** - are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed.

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Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life.

9. Pesticides - are chemical compounds commonly used to control nuisance growth or prevalence of undesirable organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

Post-Construction Runoff Management BMPs – means site design features, source control features, and treatment control BMPs that become a permanent part of the development. (See the definitions for site design, source control and treatment control BMPs).

Processing Areas – means outdoor process equipment operations such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, landfills, waste piles, wastewater and solid waste treatment and disposal, and others operations. These operations may contribute a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the storm conveyance system.

Project Footprint - means the limits of all grading and ground disturbance, including landscaping, and material lay down areas associated with a project.

Receiving Waters – means all waters that are “Waters of the State” within the scope of the California Water Code, including but not limited to natural streams, creeks, rivers, reservoirs, lakes, ponds, water in vernal pools, lagoons, estuaries, bays, the Pacific Ocean, and ground water.

Redevelopment - means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious area. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition of a structure, the removal and construction of impervious surfaces, structural development including an increase in gross floor area and/ or exterior construction or remodeling, land disturbing activities related with structural or impervious surfaces.

Residential Development - means any development on private land that provides living accommodations for one or more persons. This category includes, but is not limited to: single-family homes, multi-family homes, guest homes, condominiums, and apartments.

Restaurant - means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812).

Retail –means the sale of any product or service directly to a consumer.

Retail Gasoline Outlet - means any facility engaged in selling gasoline and lubricating oils.

Retention: means the temporary or permanent storage of stormwater to prevent it from leaving the development site.

Run-on: means stormwater surface flow or other surface flow which enters property other than where it originated.

Secondary Containment: means structures, usually dikes or berms, surrounding tanks or other storage containers, and designed to catch spilled material from the storage containers.

Site Design BMP - means any project design feature that reduces the creation or severity of potential pollutant sources or reduces the alteration of the project site's natural flow regime. Redevelopment projects that are undertaken to remove pollutant sources (such as existing surface parking lots and other impervious surfaces) or to reduce the need for new roads and other impervious surfaces by incorporating higher densities and/or mixed land uses into the project design, are also considered site design BMPs.

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Source Control BMP - means any schedules of activities, prohibitions of practices, maintenance procedures, managerial or operational practices that prevent pollutants from coming into contact with stormwater.

Stormwater - means surface runoff and drainage associated with storm events, which is free of pollutants to the maximum extent practicable.

Stormwater Conveyance System - means those artificial and natural facilities within the unincorporated area of the County, whether publicly or privately owned, by which stormwater may be conveyed to a watercourse or Waters of the State, including any roads with drainage systems, streets, catch basins, natural and artificial channels, aqueducts, stream beds, gullies, curbs, gutters, ditches, and natural and artificial channels or storm drains.

Structural BMP - means any structural facility designed and constructed to mitigate the adverse impacts of stormwater and runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

Subdivision of 10 or more units – means any subdivision of ten or more single-family or multi-family dwelling units.

Treatment Control BMP - means any engineered system designed to remove pollutants by settling of particulate pollutants, filtration, biological uptake, media adsorption, or other physical, biological, or chemical process.

Water Quality Sensitive Areas - means areas that include, but are not limited to, all Clean Water Act 303(d) impaired water bodies. Table 4 lists the 303(d)-listed receiving waters and the pollutants contributing to their impairment.

ABBREVIATIONS

ACE – United State Army Corps of Engineers

BMP – Best Management Practice

DCIA – Directly Connected Impervious Area

DEM – Department of Environmental Management

DFG – Department of Fish and Game

DPW – Department of Public Works

IPM – Integrated Pest Management

MEP – Maximum Extent Practicable

MS4 - Small Municipal Separate Storm Sewer System

NCSWMP – Napa County Stormwater Management Program

NPDES – National Pollutant Discharge Elimination System

PAH – Polycyclic Aromatic Hydrocarbon

RWQCB – Regional Water Quality Control Board

SWRCB – State Water Resources Control Board

SRMP – Stormwater Runoff Management Plan

TPH – Total Petroleum Hydrocarbons

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CHAPTER 1

INTRODUCTION

1.1 ORGANIZATION

This policy provides information on how to comply with the Post-Construction Runoff Management Requirements within the unincorporated areas of Napa County. This policy further guides the applicant through the selection, design, and incorporation of Post-Construction Best Management Practices (BMPs) into the project's design plan.

Chapter 1, "Introduction": describes the impacts of impervious surfaces on receiving waters and the legal or regulatory requirements associated with stormwater pollution control.

Chapter 2, "Project Review & Permitting Process": outlines the project plan review and approval process for projects subject to the Post-Construction Runoff Management requirements. Applicants should use Chapter 2 as the roadmap to navigate through this policy and ensure that stormwater requirements are incorporated into their projects.

Chapter 3, "Characterize Existing Conditions and Proposed Land Uses": describes the background information and analysis required to support the selection of post-construction BMPs.

Chapter 4, "Establish Post-Construction BMPs": provides the design standards for site design, source control, and treatment control BMPs.

Chapter 5, "Implementation & Maintenance of Requirements": describes how the implementation and maintenance of Post-Construction BMPs must be assured for a development. This chapter also describes the process and requirements for executing a maintenance agreement with the County.

1.2 BACKGROUND

Every stream, river, and reservoir is part of a watershed. A watershed is the area of land that captures rainfall and concentrates it into a stream or other drainage. The rain that falls onto a watershed may be infiltrated and recharged into the groundwater, absorbed and transpired by plants, or concentrated into stormwater runoff and discharged into a stream. When buildings, roads, parking lots, and other impervious surfaces are created they change the quantity and quality of stormwater runoff discharged to receiving waters. These impervious surfaces can have a significant impact on water quality and degrade the beneficial uses of receiving waters. These impacts may include increased bank erosion and downstream flooding, siltation of fish spawning grounds, and excessive algae growth.

To minimize the impacts of impervious surfaces BMPs have been designed to control the runoff rate and quality of stormwater discharged from development projects. To maximize water quality protection and minimize construction costs, Post-Construction BMPs emphasize the use of site design and source control measures to reduce the amount of directly connected impervious surfaces and minimize stormwater contact with pollutants.

1.3 LEGAL FRAMEWORK

The requirement to implement Post-Construction Runoff Management BMPs for development projects is based on Section 402 (p) of the Federal Clean Water Act (CWA). The CWA amendments of 1987 established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES program. Under these regulations, municipalities throughout the nation are issued a Municipal NPDES Permit. The primary goal of the Municipal Permit is to minimize polluted discharges from entering the stormwater conveyance system and receiving waters.

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In California, the State Water Resources Control Board (SWRCB), administers the NPDES stormwater municipal permitting program. Based on the Phase II Municipal Stormwater General Permit (General Permit) issued on May 20, 2004 by the SWRCB, Napa County is required to develop and implement a program to require the use of post-construction runoff management BMPs to reduce pollution from development projects to the maximum extent practicable (MEP).

To comply with the requirements of the General Permit, Napa County adopted the Stormwater Management and Discharge Control Ordinance (Ordinance No. 1240) on June 22, 2004. The Stormwater Ordinance prohibits illicit discharges to the stormwater conveyance system and establishes authority for the Director of Public Works to require new development and redevelopment projects to implement Post-Construction Runoff Management BMPs (Chapter 16.28.100.A).

This policy provides information on how to comply with Napa County's Post-Construction Runoff Management BMP requirements for new development and redevelopment projects. The effective date of this policy is July 1, 2008 and applies to all discretionary and ministerial projects submitting an application for a use permit, building permit, and/or grading permit on or after July 1, 2008.

CHAPTER 2

PROJECT REVIEW AND PERMITTING PROCESS

The steps below describe the elements of the plan review and permitting processes for complying with post-construction BMP requirements for projects that require a Use Permit, Structural Building Permit or Grading Permit within the unincorporated area of Napa County. The project review and permitting process for incorporating post-construction BMPs into the project design is illustrated in Appendix D.

2.1 Determine Applicable Stormwater BMP Requirements

Prior to submittal of a Use Permit, Structural Building Permit, or Grading Permit, applicants must complete the "Applicability Checklist" (see Appendix A) to determine if the project is subject to Post-Construction Stormwater Management BMP requirements. The checklist must be completed, signed by the applicant, and submitted with the application.

If the answer to any question in Part A is "yes", the project is a "Priority Project" and is subject to the Site Design, Source Control, and Treatment Control BMP design standards. If the answer to every question in Part A of is "no" and the answer to any question in Part B is "yes", the project is a "Standard Project" and is subject to the Site Design and Source Control design standards. If the answer to every question in Part A and Part B is "no", the project is exempt from the Post-Construction Runoff Management Requirements.

If the project is a Standard Project or a Priority Project, the applicant must contact the DPW (707-253-4351) to schedule a pre-application meeting. The purpose of the pre-application meeting is to discuss the BMP requirements relevant to the project and the supporting documents that must be submitted with the use permit application. Since many post-construction BMPs will have some impact on the site layout and design of the project, it is strongly recommended that the applicant schedule the pre-application meeting early in the design phase of the project.

2.2 Prepare & Submit Appropriate Plans.

Standard and Priority Projects must submit a complete Stormwater Runoff Management Plan (SRMP) to the department responsible for issuing the use, building, or grading permit. These documents will be forwarded to the DPW for review and approval.

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The SRMP must be prepared in accordance with the requirements described in Chapter 3 – “Characterize Existing Conditions and Proposed Land Uses” and Chapter 4 – “Establish Post-Construction BMPs”. The following information will help you determine what information and analysis in Chapter 3 and which Post-Construction BMP requirements in Chapter 4 apply to your project.

2.2.1 Characterize Existing Conditions and Proposed Land Uses

Before selecting Post-Construction BMPs the site must be characterized for the existing conditions and the project’s proposed land uses. Refer to Table 1 to determine what information and analysis in Chapter 3 must be included with the SRMP. This information will be used to support the selection of post-construction BMPs.

Table 1: Information and Analysis Required in Chapter 3.

Information and Analysis Required	Standard Projects	Priority Projects
3.1 Pre-Development and Post-Development Runoff ⁽¹⁾	X	X
3.2 Source Control BMP Selection	X	X
3.3 Characterize Stormwater Conveyance Systems	X	X
3.4 Treatment Control BMP Selection ⁽²⁾		X
3.5 Treatment Control BMP Sizing Worksheet ⁽²⁾		X
(1) Limited exclusion for less than 10,000 square feet of new or redeveloped impervious surfaces.		
(2) Limited Exclusion for Single Family Hillside Residences.		

2.2.2 Select Post-Construction Runoff Management BMPs

After the project has identified the pollutants and conditions of concern, Table 2 is to be used to determine the post-construction BMPs in Chapter 4 that must be incorporated into the project design.

Table 2. Post-Construction BMP Requirements Matrix.

R = Required (1) Refer to Chapter 4.1. (2) Refer to Chapter 4.2. (3) Refer to Chapter 4.3.	Site Design BMPs ⁽¹⁾	Source Control BMPs ⁽²⁾	Treatment Control BMPs ⁽³⁾
Standard Projects	<i>R</i>	<i>R</i>	
Priority Projects	<i>R</i>	<i>R</i>	<i>R</i>

2.2.3 SRMP Content

After determining the post-construction BMPs that apply to the project in Chapter 4, use the SRMP Checklist for a Complete Application in Appendix C to prepare a SRMP, utilizing the SRMP template from the Napa County Stormwater Management Program website at www.napastormwater.org. At a minimum, SRMPs for Standard and Priority Projects shall include:

1. A vicinity map of the project
2. A description of the project including existing conditions and proposed use
3. All applicable worksheets described in Table 1 above
4. A description of all applicable operational post-construction BMPs
5. A description, details, and specifications for all permanent post-construction BMPs
6. A site map showing the locations of all permanent post-construction BMPs

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2.3 Determine Adequacy of Proposed Plans.

Under the authority of the Director of Public Works, staff will review the submitted SRMP for compliance with the applicable requirements contained in this policy. The Director may approve proposed alternatives to the BMP requirements in this manual if they are determined to be applicable and equally effective.

Additional analysis or information may be required to enable staff to determine the adequacy of proposed BMPs, and will be requested through a project issues report following the conclusion of a staff review cycle.

2.4 Assure Implementation & Maintenance of Requirements.

After the SRMP has been approved by the Director, applicants must provide assurances that post-construction stormwater BMPs will be constructed and permanently maintained throughout the use of the developed site. Refer to Chapter 5, "Implementation & Maintenance of Requirements" and consult with the plan reviewer as early as possible to determine how Post-Construction BMP implementation and maintenance of post-construction BMPs will be assured. Building and grading permits will not be issued until all required long-term maintenance mechanisms are executed.

CHAPTER 3.

CHARACTERIZE EXISTING CONDITIONS AND PROPOSED LAND USES

This chapter explains the background information and analysis that must be included in the SRMP to support the selection of Site Design, Source Control, and Treatment Control BMPs to eliminate or minimize impacts to receiving waters.

3.1 Determine Peak Runoff Rates (Standard and Priority Projects)

Limited Exclusion: Projects that directly discharge to tidally-influenced channels.

If the project is proposing 10,000 or more square feet of new or redeveloped impervious surfaces, excluding roadways and driveways, the applicant must submit a drainage study with the SRMP. The drainage study shall satisfy the following requirements.

- a. The drainage study shall be prepared by a civil engineer, hydrologist, or hydrogeologist registered in the State of California.
- b. The drainage study shall compute the pre-development total runoff volume from the project area. The total runoff volume shall be determined for the 2-year, 24-hour storm event for the project area.

3.2 Identify Anticipated Activities and Pollution Sources (Standard and Priority Projects)

All Standard and Priority Projects must submit a completed Source Control BMP Selection Worksheet (Appendix E) with their SRMP to identify all anticipated activities and potential pollution sources associated with the project's future use. The project's design must incorporate all applicable Source Control BMPs in Chapter 4.2 to eliminate illicit and non-stormwater discharges. At a minimum, the following activities and pollution sources must be considered.

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A. Roads and Driveways	I. Loading and Unloading Dock Areas
B. Parking Areas (≥ 25 spaces or ≥ 5,000 sq. ft.)	J. Outdoor Material Storage Areas
C. New or Reconstructed Stormwater Conveyance Systems	K. Processing Areas
D. Storm Drain Inlets, Open Channels, and Creeks	L. Vehicle/Equipment Repair and Maintenance Areas
E. Landscaping	M. Vehicle/Equipment Wash Areas
F. Trash Storage Areas	N. Food Service Equipment Cleaning
G. Pools, spas and Fountains	O. Interior Floor Drains
H. Roofs, Gutters, and Downspouts	P. Fueling Areas

3.3 Identify Stormwater Conveyance Systems (Standard and Priority Projects)

The SRMP must identify on the site map and describe all existing and proposed stormwater conveyance systems, receiving waters, flood zones, and floodways within 150 feet of the project footprint. The following description or analysis must be provided for each stormwater conveyance system:

Ministerial Projects

- a. The type of stormwater conveyance system (e.g. closed system, ditch, blue-line stream, non-blue-line stream, etc.)
- b. Channel depth and bank slopes for open channels
- c. The minimum, maximum, and average slope and distance between the stormwater conveyance system and the project footprint
- d. The extent of the National Flood Insurance Program 100-year flood zone and floodway

Discretionary Projects

- a. The type of stormwater conveyance system (e.g. closed system, ditch, blue-line stream, Class I, II, III, or IV stream, etc.)
- b. Channel depth and bank slopes for open channels
- c. The minimum, maximum, and average slope and distance between the stormwater conveyance system and the project footprint
- d. National Flood Insurance Program 100-year flood zone and floodway
- e. A description and analysis of the existing vegetation between the stormwater conveyance system and the project footprint. The description must identify the type(s) of vegetation and the location, extent, and percent cover for each vegetation type. The analysis shall also include a list of all non-native invasive species that are present and their percent cover
- f. A description and analysis of bank stability for open stormwater conveyance systems

3.4 Identify Pollutants and Conditions of Concern (Priority Projects)

Priority Projects that must incorporate Treatment Control BMPs into the project design must provide a completed Treatment Control BMP Selection Worksheet (Appendix F) with their SRMP. This worksheet is used to identify anticipated pollutants generated from the proposed land uses and activities, identify

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pollutants causing impairment of downstream receiving waters, and to select one or more treatment control BMPs that maximize the removal of anticipated pollutants and pollutants of concern.

CHAPTER 4

ESTABLISH POST-CONSTRUCTION BMPs

After characterizing the existing conditions and proposed land uses in Chapter 3, Standard and Priority Projects shall incorporate and implement all applicable Site Design and Source Control BMPs in Chapters 4.1 and 4.2 respectively. In addition, Priority Projects must also implement the treatment control BMPs in Chapter 4.3. Applicants may employ comparable and equally effective site design and source control BMPs, satisfactory to the Director.

Projects are encouraged to address these requirements through the creation of a hydrologically-functional project design that attempts to mimic the natural hydrologic regime. Mimicking a site's natural hydrologic regime can be pursued by:

- Reducing imperviousness (such as, new surface parking lots), preserving and/or enhancing vegetation adjacent to receiving waters, using natural drainage courses in the stormwater conveyance system, and minimizing clearing and grading
- Providing runoff storage measures dispersed throughout a site's landscape with the use of a variety of infiltration, retention, and detention runoff practices
- Implementing hydrologically functional landscape design and management practices

These design principles offer an innovative approach to stormwater management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead strategically integrates stormwater controls throughout the landscape. Useful resources for applying these principles include *Start at the Source* (1999) and *Low-Impact Development Design Strategies* (1999).

Effective source controls offer another strategy to reduce a project's need for treatment. Applicants are encouraged to design projects so that runoff is treated by Site Design BMPs, such as rooftop runoff treated in landscaping,. Therefore, projects shall incorporate, where applicable, stormwater BMPs into the project design, in the following progression:

Site Design BMPs: Site planning approaches aimed at either preventing or reducing adverse impacts of stormwater pollutants and increases in peak runoff rate, volume, and duration on water quality and beneficial uses. Site design measures use techniques such as preserving existing vegetation and reducing impervious surfaces when planning the layout of a development or redevelopment project.

Source Control BMPs: Structural controls or operational practices designed to prevent or limit pollution generation from a source (e.g., chemical storage area, industrial processing, vehicle washing and/or maintenance area, etc.) so that pollutants do not come in contact with stormwater. In this policy, source control refers to controlling the sources of pollutants, not sources of flow (hydrologic source control). Hydrologic source control is covered under site design measures.

Treatment Control BMPs: Landscape or structural systems designed to treat or remove pollutants in stormwater or to reduce the amount or rate of stormwater. Treatment controls include detention basins, water quality wetlands, vegetated swales, bioretention, filters, and solid separators.

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The series of Post-Construction BMP requirements listed in this chapter have been organized sequentially to allow the applicant to incorporate the Site Design BMPs, Source Control BMPs, and finally Treatment Control BMPs into the site design. More information about Site Design, Source Control, and Treatment Control BMPs is available at www.napastormwater.org or www.cabmphandbooks.com.

Waiver of Impracticability

A waiver of impracticability may be granted by the Director for any Site Design or Treatment Control requirement only if all possible BMPs have been considered and rejected as impracticable. Recognized situations of impracticability include, 1) extreme limitations of space for treatment on a redevelopment project; 2) unfavorable or unstable soil conditions at a site to attempt infiltration; and 3) risk of ground water contamination because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than 10 feet from the soil surface.

4.1 SITE DESIGN BMPs

A. Maintain Pre-Development Rainfall Runoff Characteristics.

Limited Exclusion: Standard and Priority Projects with less than 10,000 sq feet of new or redeveloped impervious surfaces, excluding roadways and driveways, OR projects that discharge directly to a tidally-influenced channel.

- a. Post-development runoff volume shall not exceed pre-development runoff volume for the 2-year, 24-hour storm event. Post-development runoff volume shall be determined by the same method used to determine pre-development conditions. The project may satisfy this requirement by implementing one or more of the following site design BMPs.
 - ✓ Minimize impervious footprint. Examples may include: (1) Increasing building density (number of stories above or below ground); (2) constructing walkways, trails, patios, overflow parking lots and alleys and other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials; (3) constructing streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised; and (4) minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
 - ✓ Conserve natural areas. (1) Concentrate or cluster development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition; and (2) Use natural drainage systems to the maximum extent practicable (natural drainages and vegetated swales are preferred over using lined channels or underground storm drains).
 - ✓ Minimize Directly Connected Impervious Areas. (1) Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the stormwater conveyance system; and (2) where landscaping is proposed, drain impervious parking lots, sidewalks, walkways, trails, and patios into adjacent landscaping.
 - ✓ Maximize canopy interception and water conservation. (1) Preserve existing native trees and shrubs; and (2) plant additional native or drought tolerant trees and large shrubs in place of non-drought tolerant species.
- b. If post-development runoff volume exceeds pre-development runoff volume after the site design BMPs are incorporated into the project's overall design, a structural BMP (e.g. bioretention unit) may be used to capture and infiltrate the excess volume.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

B. Protect Sensitive Resource Areas

- a. Establish buffer zones between receiving waters and the project footprint. At a minimum, all projects must comply with the stream setback requirements in the County's Conservation Regulations (Chapter 18.108) and Floodplain Management Ordinance (16.04). Discretionary projects may also be required to implement wider buffer zones to fully protect aquatic resources. Appropriate buffer distances range from 35 to 150 feet depending on the slope, adjacent land use, and the aquatic resources of concern.

4.2 SOURCE CONTROL BMPs

A. Roads and Driveways

1. Comply with the latest version of the Napa County Road and Street Standards.
2. It is highly recommended that road design and construction follow the guidelines in the "Handbook for Forest and Ranch Roads" (Weaver and Hagans, 1994) to minimize the discharge of pollutants and minimize maintenance costs. A copy of the handbook can be obtained at the Department of Public Works.

B. Parking Areas

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons (PAH) that are deposited on parking lot surfaces by motor vehicles. These pollutants are directly transported to surface waters unless BMPs are used to filter pollutants from stormwater runoff.

To minimize the offsite transport of pollutants, the following design criteria are required:

1. Reduce impervious land coverage of parking areas. Permeable surfaces in overflow parking or other areas may be used to meet this requirement.
2. Direct runoff from paved surfaces to appropriate landscaping to infiltrate and treat stormwater.
3. Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces, sports event parking lots, shopping malls, grocery stores, discount warehouse stores).
4. Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control.

C. New or Reconstructed Stormwater Conveyance Systems

1. Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters. **Note:** DFG 1603, ACE/RWQCB 404/401 permits may be required. Applicant must submit proof of compliance with these State and Federal rules prior to construction.
2. Ditches and other open conveyance systems shall be lined with vegetation, rock or other material to minimize erosion of the bed and bank. In order to reduce channel velocities and provide some treatment of stormwater runoff, vegetation shall be the preferred lining provided the critical velocity/shear stress does not exceed the permissible velocity/shear stress of vegetation.
3. Where practicable, ditches, and other open conveyance systems shall have a vegetated buffer to protect exposed soils and to filter stormwater runoff before entering the conveyance system.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

D. Storm Drain Inlets, Open Channels, and Creeks

(Limited Exclusion: Detached Residential Homes)

1. Provide concrete stamping, or equivalent, of all stormwater conveyance system inlets and catch basins within the project area with prohibitive language (e.g., “No Dumping – Drains to XXXX River/Creek/Lake”). Signage shall identify the receiving water the drain discharges to and include a message in Spanish.
2. Install bollards, fencing, or other appropriate barriers at public access points along channels and creeks to prevent illegal dumping.

E. Landscaping

1. Preserve existing native trees, shrubs, and groundcover to the maximum extent practicable.
2. 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.
3. Where landscaped areas are used to detain or retain stormwater, use plant species that are tolerant of saturated soil conditions.
4. Consider using pest-resistant plants, especially adjacent to impervious surfaces.
5. To insure successful establishment, select plants appropriate to the soils, slopes, climate, sun, wind, and other site conditions.

F. Trash Storage Areas

(Limited Exclusion: Detached residential homes)

1. Trash storage areas shall be paved with an impervious surface, designed not to allow run-on from adjoining areas, and screened or walled to prevent off-site transport of trash.
2. Trash storage areas must contain a roof or awning to minimize direct precipitation or contain attached lids on all trash containers that exclude rain.

G. Pools, Spas, and Fountains

1. Pool (including swimming pools, hot tubs, spas and fountains) discharge drains shall not be connected directly to the storm drains or sanitary sewer system. [Exception: Public pool discharge drains must be connected to the sanitary sewer system, per County Department of Environmental Health requirements.]
2. To allow for the draining of pools, hot tubs, and spas, a cleanout plumbed to a sanitary sewer system, but not a septic tank, shall be installed in a readily accessible area or a designated landscaped area must be designated that is adequate to contain and infiltrate the water. For discharges to a sanitary sewer system, the applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

H. Roofs, Gutters, and Downspouts

1. All roofs, gutters, and/or downspouts made of copper or other unprotected metals shall discharge to landscaping or other pervious surface designed and maintained appropriately to prevent soil erosion.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

I. Loading and Unloading Dock Areas

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

1. Cover loading dock areas or design drainage to preclude stormwater run-on and runoff.
2. Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

J. Outdoor Material Storage Areas

(Limited Exclusion: Detached residential homes)

1. Smaller quantities of materials and wastes (e.g. pesticides, fertilizers, etc.) with the potential to contaminate stormwater must be placed in an enclosure such as a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the stormwater conveyance system.
2. If impracticable to cover larger quantities of materials and wastes (e.g. soil, compost, treated lumber) the area must be designed to preclude stormwater run-on and temporarily covered with tarps during rain events.
3. Storage areas for liquid materials and wastes must have a permanent cover to keep rainwater out of the storage area and protected by secondary containment structures such as berms, dikes, or curbs.
4. All hazardous materials and wastes on the site must be used and stored in compliance with the Napa County's Hazardous Materials Ordinance and Hazardous Materials Management Plan for the site approved by the Department of Environmental Management.

K. Processing Areas

1. Processing areas shall be paved and performed indoors or under a cover to keep rainwater out of the processing area.
2. If the processing area is outdoors, grade or berm the processing area to prevent run-on from surrounding areas.
3. Installation of storm drains in processing areas is prohibited.
4. For processing areas that generate liquid wastes, slope the area to a drain to the sanitary sewer system or other approved collection system.

L. Vehicle/Equipment Repair and Maintenance Areas

(Limited Exclusion: Detached residential homes)

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance area can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

1. Vehicle/equipment repair and maintenance shall be performed in a designated area indoors, or if such services must be performed outdoors, the area must be covered and designed to prevent the run-on and runoff of stormwater.
2. Secondary containment shall be provided for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.

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3. Repair and maintenance areas shall not contain floor drains unless the floor drains are connected to a closed-loop system or the sanitary sewer system if allowed by an industrial waste discharge permit. The applicant shall comply with the local permitting authority and/or sanitary district's connection and discharge requirements.
4. Tanks, containers or sinks used for parts cleaning or rinsing shall not be connected to the storm drain system. Tanks, containers or sinks used for such purposes may only be connected to a closed-loop system or the sanitary sewer system if allowed by an industrial waste discharge permit. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

M. Vehicle/Equipment Wash Areas ***(Limited Exclusion: Detached residential homes)***

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. The design plans for vehicle/equipment wash areas must comply with the following standards:

1. Wastewater from vehicle and equipment washing operations shall not be discharged to the storm drain system. **Limited Exclusion:** Car dealerships may discharge wastewater from the rinsing of dust from vehicle exterior surfaces if soap or other cleaning agents are not used.
2. Vehicle/equipment washing areas shall be covered, paved, designed to prevent run-on and runoff from the washing area, and plumbed to drain to the sanitary sewer or closed-loop system. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

N. Food Service Equipment Cleaning

The activity of equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. Include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area shall:

1. Have a sink or other area for cleaning floor mats, containers, and equipment, that is connected to a grease interceptor prior to discharging to the sanitary sewer system. The cleaning area shall be large enough to clean the largest mat or piece of equipment to be cleaned.
2. The cleaning area shall be indoors or in a covered area outdoors; both areas must be plumbed to the sanitary sewer.

O. Interior Floor Drains

1. Interior floor drains shall be plumbed to the sanitary sewer system or closed loop system and shall not be connected to storm drains.

P. Fueling Areas

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

1. Retail fueling stations must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.

2. All fuel dispensing areas must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
3. All fuel dispensing areas must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents runoff of storm water to the extent practicable.
4. At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.
5. Above-ground fuel tanks must be protected with a secondary containment structure of sufficient volume to contain all of the fuel in the event of a tank rupture or leak.

4.3 Treatment Control BMPs

A. Treatment BMP Sizing Standards

After site design and source control BMPs have been incorporated into the project design, priority projects subject to the treatment control requirements (see Table 2) shall design a single or combination of treatment control BMPs designed to infiltrate, filter, and/or treat runoff from the project footprint to one of the "Numeric Sizing Treatment Standards" listed below.

VOLUME

Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

- a. The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or
- b. The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/ Commercial, (2003); or
- c. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

Flow

Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

- a. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the area; or
- b. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

Applicants must use the Treatment Control BMP Selection Worksheet (Appendix F) to select appropriate treatment control BMPs based upon anticipated pollutants and downstream conditions of concern. After the treatment control BMPs are selected, applicants must properly size the treatment control BMPs according to one of the Numeric Sizing Treatment Standards in Table 3. Treatment efficiencies can also be realized by locating treatment controls strategically within a drainage basin without being limited by the project boundary.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

In all instances, structural treatment BMP(s) may be located on or off-site, used singly or in combination, or shared by multiple new developments, pursuant to the following criteria:

1. All treatment control BMPs shall infiltrate, filter, and/or treat the required runoff volume or flow prior to discharging to any receiving water body supporting beneficial uses;
2. Post-construction treatment control BMPs for a single priority project shall collectively be designed to comply with the numeric sizing treatment standards;
3. Shared BMPs shall be operational prior to the use of any dependent development or phase of development. The shared BMPs shall only be required to treat the dependent developments or phases of development that are in use;
4. Interim stormwater BMPs that provide equivalent or greater treatment than is required may be implemented by a dependent development until each shared BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until Post-Construction BMPs are operational.

B. Restrictions on the Use of Infiltration Treatment BMPs

Treatment control BMPs that are designed to primarily function as infiltration devices shall meet the following conditions (these conditions do not apply to treatment BMPs which allow incidental infiltration and are not designed to primarily function as infiltration devices, such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.). **Note:** Notification to neighboring jurisdictions may be required where staff determines the infiltration BMP(s) may impact the groundwater in a neighboring jurisdiction.

1. Runoff from commercial developments shall undergo pretreatment, such as filtration, to remove both physical and chemical contaminants prior to infiltration;
2. All dry weather flows shall be diverted from infiltration devices except for those non-stormwater discharges authorized pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1): diverted stream flows, rising ground waters, uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to stormwater conveyance systems, uncontaminated pumped ground water, foundation drains, springs, water from crawl space pumps, footing drains, air conditioning condensation, flow from riparian habitats and wetlands, water line flushing, landscape irrigation, discharges from potable water sources other than water main breaks, irrigation water, individual residential car washing, and dechlorinated swimming pool discharges;
3. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural treatment BMPs are to be used;
4. The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet. Where groundwater does not support beneficial uses, this vertical distance criterion may be reduced, provided groundwater quality is maintained;
5. The soil through which infiltration is to occur shall have physical and chemical characteristics that are adequate for proper infiltration durations and treatment of stormwater runoff for the protection of groundwater beneficial uses¹;
6. The horizontal distance between the base of any infiltration structural BMP and any water supply wells shall be 100 feet or as determined appropriate by the Department of Environmental Management.

¹ Soils at infiltration sites must have the following properties: Organic Content (OC) > 5%, pH between 6-8, Cation exchange capacity (CEC) > 5 meq/100g soil, in drill-hole conductivity valve of 0.5 in/hr or greater.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

C. Vector Control Requirements

Treatment Control BMPs shall be designed and maintained to prevent the production of adult mosquitoes that pose a public health risk. Refer to Appendix G for guidance on selecting, designing, and maintaining treatment control BMPs to eliminate or minimize the production of adult mosquitoes.

CHAPTER 5

IMPLEMENTATION AND MAINTENANCE OF REQUIREMENT

This chapter explains the requirement to maintain all post-construction BMPs throughout the use of a project. Maintenance is essential for assuring that post-construction BMPs continue to function properly and do not become a nuisance. Examples of maintenance mechanisms, operation and maintenance plans, and inspection checklists can be found at www.napastormwater.org or www.cabmphandbooks.com.

5.1 Mechanisms to Assure Maintenance

After all post-construction BMPs have been approved by the Director, applicants shall execute one of the following mechanisms, satisfactory to the Director, to ensure that all Post-Construction BMPs will be maintained throughout the “use” of a project site. Additional mechanisms may be considered provided that the requirements are as comprehensive as those listed below. In all instances, the applicant shall provide proof of execution of a County-approved mechanism for post-construction BMP maintenance, repair, and/or replacement before the issuance of building and/or grading permits. Applicants are encouraged to discuss maintenance mechanism alternatives early in the planning process.

Public Entity’s Signed Statement. For cases in which a public entity accepts responsibility for the maintenance of a BMP, the mechanism would be a signed statement from the public entity assuming responsibility for post-construction BMP maintenance and that it meets all local agency design standards/criteria.

Sales or Lease Agreement. Another mechanism may consist of written conditions in the sales or lease agreement that require the recipient to assume responsibility for maintenance and conduct a maintenance inspection at least once per year.

Conditions, Covenants, and Restrictions (CC&Rs). For properties on which the BMPs are located within a common area that will be maintained by an association, the language regarding the responsibility for maintenance must be included in the project’s CC&Rs.

Maintenance Agreement. An agreement assigning maintenance responsibility to the property owner may be executed between the County and a property owner. The agreement would be recorded among the deed records at the County Recorder’s Office so that it would run with the title to the land.

Special Tax District. The County may create a special tax district within which a stormwater tax would be assessed for the purpose of providing a revenue stream for BMP maintenance, which would be conducted by the County.

5.2 Maintenance Requirements

The maintenance assurance mechanism executed with the County shall include: a maintenance plan, annual reporting, access to property, and remediation of problems.

1. Maintenance Plan. The project sponsor must prepare a maintenance plan, the implementation of which will keep the proposed post-construction BMPs operating as originally designed and approved. At a minimum the Maintenance Plan shall include: a site map showing the locations BMPs subject to the maintenance mechanism, the schedule of activities that will be performed to ensure that BMPs operate as designed and approved, provisions for unscheduled maintenance, example checklists for documenting

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

maintenance and inspections of BMPs, estimated design life, and costs associated with the design life including replacement.

2. Annual Report. Each year the entity responsible for maintenance is required to complete an annual report that includes copies of completed inspection and maintenance checklists to document that maintenance activities were conducted during the previous year. The annual report shall be retained for a period of at least five years and made available upon request by the County.

3. Access to Property. Permission is granted to the County of Napa staff and Napa County Mosquito Abatement District staff to enter the property to verify that maintenance is being conducted in accordance with the maintenance plan. Easements may be required.

4. Remediation of Problems. In the event adequate maintenance is not conducted, County staff is allowed the option to enter the property and take necessary steps to restore the BMPs to good working order. The property owner will be responsible for reimbursing the County for expenditures associated with restoring the BMPs to good working order.

**NAPA COUNTY
POST-CONSTRUCTION RUNOFF MANAGEMENT
REQUIREMENTS**

APPENDIX A

APPLICABILITY CHECKLIST

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

APPENDIX A – APPLICABILITY CHECKLIST

<h3 style="margin: 0;">Post-Construction Runoff Management Applicability Checklist</h3>	County of Napa Department of Public Works 1195 Third Street Napa, CA 94559 (707) 253-4351 for information	
Project Address:	Assessor Parcel Number(s):	Project Number: <i>(for County use Only)</i>
Instructions: Structural projects requiring a use permit, building permit, and/or grading permit must complete the following checklist to determine if the project is subject to the Post-Construction Runoff Management Requirements. In addition, the impervious surface worksheet on the reverse page must also be completed to calculate the amount of new and reconstructed impervious surfaces proposed by your project. This form must be completed, signed, and submitted with your permit application(s). Definitions are provided in the Post-Construction Runoff Management Requirements policy. Note: If multiple building or grading permits are required for a common plan of development, the total project shall be considered for the purpose of filling out this checklist.		
POST-CONSTRUCTION STORMWATER BMP REQUIREMENTS (Parts A and B) ✓ If any answer to Part A are answered "yes" your project is a "Priority Project" and is subject to the Site Design, Source Control, and Treatment Control design standards described in the Napa County Post-Construction Runoff Management Requirements. ✓ If all answers to Part A are "No" and any answers to Part B are "Yes" your project is a "Standard Project" and is subject to the Site Design and Source Control design standards described in the Napa County Post-Construction Runoff Management Requirements. ✓ If every question to Part A and B are answered "No", your project is exempt from post-construction runoff management requirements.		
Part A: Priority Project Categories Does the project meet the definition of one or more of the priority project categories?		
1. Residential with 10 or more units		Yes No
2. Commercial development greater than 100,000 square feet.....		Yes No
3. Automotive repair shop.....		Yes No
4. Retail Gasoline Outlet.....		Yes No
5. Restaurant.....		Yes No
6. Parking lots with greater than 25 spaces or greater than 5,000 square feet.....		Yes No
*Refer to the definitions section for expanded definitions of the priority project categories.		
Part B: Standard Project Categories Does the project propose:		
1. A facility that requires a NPDES Permit for Stormwater Discharges Associated with Industrial Activities?.....		Yes No
2. New or redeveloped impervious surfaces 10,000 square feet or greater, excluding roads?.....		Yes No
3. Hillside residential greater than 30% slope.....		Yes No
4. Roadway and driveway construction or reconstruction which requires a Grading Permit.....		Yes No
5. Installation of new storm drains or alteration to existing storm drains?.....		Yes No
6. Liquid or solid material loading and/or unloading areas?.....		Yes No
7. Vehicle and/or equipment fueling, washing, or maintenance areas, excluding residential uses?.....		Yes No
8. Commercial or industrial waste handling or storage, excluding typical office or household waste?.....		Yes No
Note: To find out if your project is required to obtain an individual General NPDES Permit for Stormwater discharges Associated with Industrial Activities, visit the State Water Resources Control Board website at, www.swrcb.ca.gov/stormwtr/industrial.html		

**NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS
APPENDIX A – APPLICABILITY CHECKLIST**

Impervious Surface Worksheet

Project phasing to decrease impervious surface area shall not exempt the project from Post-Construction Runoff Management requirements. A new development or redevelopment project must comply with the requirements if it is part of a larger common plan of development that would result in the creation, addition and/or reconstruction of one acre or more of impervious surface. (For example, if 50% of a subdivision is constructed and results in 0.9 acre of impervious surface, and the remaining 50% of the subdivision is to be developed at a future date, the property owner must comply with the Post-Construction Runoff Management requirements.)

Type of Impervious Surface	Impervious Surface (Sq Ft)			Total New and Reconstructed Impervious Surfaces (Sq Ft)
	Pre-Project (if applicable)	New (Does not replace any existing impervious area)	Reconstructed (Replaces existing impervious area)	
Buildings, Garages, Carports, other Structures with roofs				
Patio, Impervious Decking, Pavers and Impervious Liners				
Sidewalks and paths				
Parking Lots				
Roadways and Driveways,				
Off-site Impervious Improvements				
Total Area of Impervious Surface (Excluding Roadways and Driveways)				

.....

Incorrect information on proposed activities or uses of a project may delay your project application(s) or permit(s).

I declare under penalty of perjury, that to the best of my knowledge, the information presented herein is accurate and complete.

Name of Owner or Agent (Please Print):	Title:
Signature of Owner or Agent:	Date:

**NAPA COUNTY
POST-CONSTRUCTION RUNOFF MANAGEMENT
REQUIREMENTS**

APPENDIX B

APPLICATION FOR SRMP REVIEW

**NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS
APPENDIX B – APPLICATION FOR SRMP REVIEW**

FOR OFFICE USE ONLY			
SUBMITTAL DATE: _____ FILE #: _____ APN #: _____			
USGS QUAD: _____ CalWatershed: _____			
REQUEST: _____			
USE PERMIT CATEGORY: <input type="checkbox"/> Hillside Residence <input type="checkbox"/> Subdivision <input type="checkbox"/> Commercial Facility TYPE: <input type="checkbox"/> Private <input type="checkbox"/> Public			
BUILDING AND/OR GRADING PERMIT: <input type="checkbox"/> Structure <input type="checkbox"/> Driveway <input type="checkbox"/> Road <input type="checkbox"/> Reservoir <input type="checkbox"/> Cave <input type="checkbox"/> Other			
FINAL APPROVAL: Date: _____			
Deposit: \$ _____			
<i>Deposit</i>	<i>Receipt Number</i>	<i>Received By</i>	<i>Date</i>
TO BE COMPLETED BY APPLICANT			
<i>(Please type or print legibly)</i>			
Applicant's Name: _____		Company: _____	
Telephone #: (____) _____	Fax #: (____) _____	E-Mail: _____	
Mailing Address: _____			
<i>No</i>	<i>Street</i>	<i>City</i>	<i>State</i> <i>Zip</i>
Status of Applicant's Interest in Property: _____			
Property Owner's Name: _____			
Telephone #: (____) _____	Fax #: (____) _____	E-Mail: _____	
Mailing Address: _____			
<i>No</i>	<i>Street</i>	<i>City</i>	<i>State</i> <i>Zip</i>
Site Address/Location: _____			
<i>No</i>	<i>Street</i>	<i>City</i>	
Assessor's Parcel #(s): _____			
<p>SIGNATURE: I hereby certify that all the information contained in this application, including but not limited to, this application form, the Stormwater Runoff Management Plan (SRMP), the supplemental information sheets, site plan, plot plan, cross sections/elevations, is complete and accurate to the best of my knowledge. I hereby authorize such investigations including access to County Assessor's Records as are deemed necessary by the Department of Public Works for evaluation of this application and preparation of reports related thereto, including the right of access to the property involved.</p>			
_____ Signature of Applicant	_____ Date	_____ Signature of Property Owner	_____ Date

**NAPA COUNTY
POST-CONSTRUCTION RUNOFF MANAGEMENT
REQUIREMENTS**

APPENDIX C

SRMP Checklist for a Complete Application

**NAPA COUNTY CONSTRUCTION SITE RUNOFF CONTROL REQUIREMENTS
APPENDIX C – SRMP CHECKLIST FOR A COMPLETE APPLICATION**

<u>FOR OFFICIAL USE ONLY</u>	
PLAN REVIEWER: _____	DATE RECEIVED: _____
PROJECT NAME: _____	PROJECT NUMBER: _____
PERMIT CATEGORY: <input type="checkbox"/> Use Permit <input type="checkbox"/> Building Permit <input type="checkbox"/> Grading Permit	
Project Category (check all applicable Priority or Standard Project categories)	
<input type="checkbox"/> Priority Project	<input type="checkbox"/> Standard Project
____ Residential with 10 or more units	____ Industrial NPDES permit
____ 100,000 sq ft commercial	____ Impervious surface > 10,000 sq ft (excluding roads)
____ Automotive repair shop	____ Hillside residential on slopes 30% or more
____ Restaurant	____ Roadways and driveways that require a grading permit
____ Retail Gasoline Outlet	____ New or alteration of storm drains
____ Parking Lot (>25 spaces or >5,000SF)	____ Liquid or solid material loading areas
	____ Vehicle or equipment fueling, washing, or maintenance
	____ Commercial or industrial waste handling and storage

At a minimum, the Stormwater Runoff Management Plan must cover the areas listed below.

√ = Complete, X = Incomplete, NA = Not Applicable

A. Planning and Organization

1. ____ Completed Post-Construction BMP Applicability Checklist (Appendix A)
2. ____ Completed SRMP General Information Form (Appendix B).
2. ____ Vicinity map showing the site in relation to the surrounding area.
3. ____ If applicable, incorporate or reference other regulatory permits and their requirements. **Note:** All State and Federal Permits (1600, 401/404, General Permit, etc) must be approved prior to any construction within State Waters.
4. ____ Describe the nature of the proposed use of the development project.

B. Identify Pollutants and Conditions of Concern

1. ____ Standard and Priority Projects proposing 10,000 or more sq. ft. of new impervious surface, excluding roadways and driveways or projects directly discharging to tidally-influenced receiving waters, must prepare a drainage study that calculates the pre-development runoff volume according to the criteria in Chapter 3.1.
2. ____ Standard and Priority Projects must provide a completed Source Control BMP Selection Worksheet (Appendix E) that lists all anticipated activities associated with the use of the proposed project that have the potential to generate pollutants.
3. ____ Standard and Priority Projects must list and describe all stormwater conveyance systems (e.g. storm drain, ditch, creek, etc) within 150 feet of the project footprint. Discretionary projects must also provide an analysis for all open stormwater conveyance systems. At a minimum, the analysis must consider the criteria in Chapter 3.3.

NAPA COUNTY CONSTRUCTION SITE RUNOFF CONTROL REQUIREMENTS
APPENDIX C – SRMP CHECKLIST FOR A COMPLETE APPLICATION

4. ____ Priority Projects required to incorporate Treatment Control BMPs into the project design shall provide a completed Post-Construction BMP Selection Worksheet (Appendix F).

D. Post-Construction BMPs

Site Design BMPs

1. ____ List and describe all Site Design BMPs used to maintain stormwater runoff volumes to pre-development conditions according to the criteria described in Chapter 4.1. If structural controls are required to maintain pre-development peak runoff conditions, a description of why Site Design BMPs alone are not practicable for maintaining runoff conditions is required.
2. ____ List and describe all structures (outfalls, culverts, etc.) proposed within the jurisdiction of the DFG, RWQCB, and/or ACE. The description must include the structure's specifications and designed storm capacity. The structure must be constructed in accordance with all applicable State and Federal permits.
3. ____ Provide the average slope and minimum and maximum distance between the project footprint and all open stormwater conveyance systems (e.g. ditches, creeks, etc.). Ministerial projects must establish setbacks that comply with the stream setback requirements in the Conservation Regulations and Floodplain Management Regulations. Discretionary projects may establish and/or restore wider buffers zones to protect aquatic resources and structures.

Source Control BMPs

4. ____ List and describe all source control measures included in the project design to eliminate pollutant contact with stormwater from the anticipated activities identified in the Source Control BMP Selection worksheet (Appendix E). The description must include the location and design specifications for each source control BMP.

Treatment Control BMPs

5. ____ Priority Projects provide a completed Treatment Control BMP Selection Worksheet (Appendix F) and include a description of the location and design specifications for each treatment control BMP.
6. ____ Provide the calculations used to design the treatment control BMPs to satisfy the numeric sizing treatment standards in Chapter 4.3. Applicants may count the site design BMPs toward meeting these numeric standards.

F. Site Plan

The site plan shall be neat and legible and shall be drawn on a 24" X 36" sheet and shall be folded to 8 ½ " by 11" prior to submittal. When two or more sheets are used to illustrate the plan view, an index sheet is required, illustrating the entire project on one (1) 24" x 36" (minimum) sheet. The entire parcel shall be identified on the plan. If only a portion of the site will be developed, the entire parcel may be shown as a detail, with the area to be developed, cleared, and/or graded drawn to an appropriate scale.

The site plan shall include all of the following:

1. ____ Provide a legend and north arrow on the plan.
2. ____ Maximum plan scale of 1" = 100'.
3. ____ An outline of the entire property.
4. ____ Provide a "limit of disturbance" line which shows the limit of soil disturbance and areas where existing vegetation is preserved.

**NAPA COUNTY CONSTRUCTION SITE RUNOFF CONTROL REQUIREMENTS
APPENDIX C – SRMP CHECKLIST FOR A COMPLETE APPLICATION**

5. ____ All open stormwater conveyance systems (e.g. ditches, creeks) and setback distances must be delineated.
6. ____ State and Federal wetlands must be accurately delineated.
7. ____ The National Flood Insurance Program 100 Year Flood Zone and Flood Way must be delineated.
8. ____ Drainage areas on the property and direction of flow. Map must extend as far outside the site perimeter as necessary to illustrate relevant drainage areas. Where relevant drainage areas are too large to depict on the map, map notes or inserts are sufficient.
9. ____ All storm drain inlets and outlets must be located on the plan.
10. ____ Anticipated stormwater discharge locations.
11. ____ Location of existing and future Site Design and source Control BMPs.
12. ____ Location of existing and future Treatment Control BMPs.
13. ____ Location of existing and future “impervious” areas - paved areas, buildings, covered areas.

G. Post-Construction BMP Implementation and Maintenance Agreement

1. ____ One of the maintenance mechanisms described in Chapter 5A, which is satisfactory to the Director, must be signed and executed.
2. ____ Include a signed Owner’s Certification that states “I, the undersigned, certify that all land clearing, construction and development shall be done pursuant to the approved plan.” This must be signed in ink on each plan submitted or on an original reproducible.

**NAPA COUNTY
POST-CONSTRUCTION RUNOFF MANAGMENT
REQUIREMENTS**

APPENDIX D

**DEVELOPMENT PLAN REVIEW PROCESS FOR DISCRETIONARY
PERMITS**

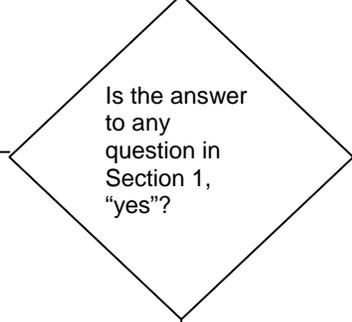
NAPA COUNTY CONSTRUCTION SITE RUNOFF CONTROL REQUIREMENTS
APPENDIX D – DEVELOPMENT PLAN REVIEW PROCESS FOR DISCRETIONARY PERMITS

STAGE

Pre-Application Meeting

(Note: can also occur during Project Application stage)

Applicant provides a completed Post-Construction Runoff Management Applicability Checklist form.



Project is exempt from Post-Construction Runoff Management requirements.

Planning Permit Process

DPW provides applicant with Application for SRMP Review and SRMP Checklist for a Complete Application and identify applicable Post-Construction Runoff Management requirements.

DPW provides resources on the selection and design of Post-Construction BMPs. Encourage applicant to moderate peak runoff and treat stormwater runoff using site design BMPs.

Applicant submits Application for SRMP Review to the DPW.

CEQA Compliance (Discretionary Projects)

Performed in parallel with Post-Construction Runoff Management compliance and project planning. May extend through project application.

Provide CEQA Initial Study checklist.

Provide guidance on interpreting CEQA Initial Study checklist and water quality impacts.

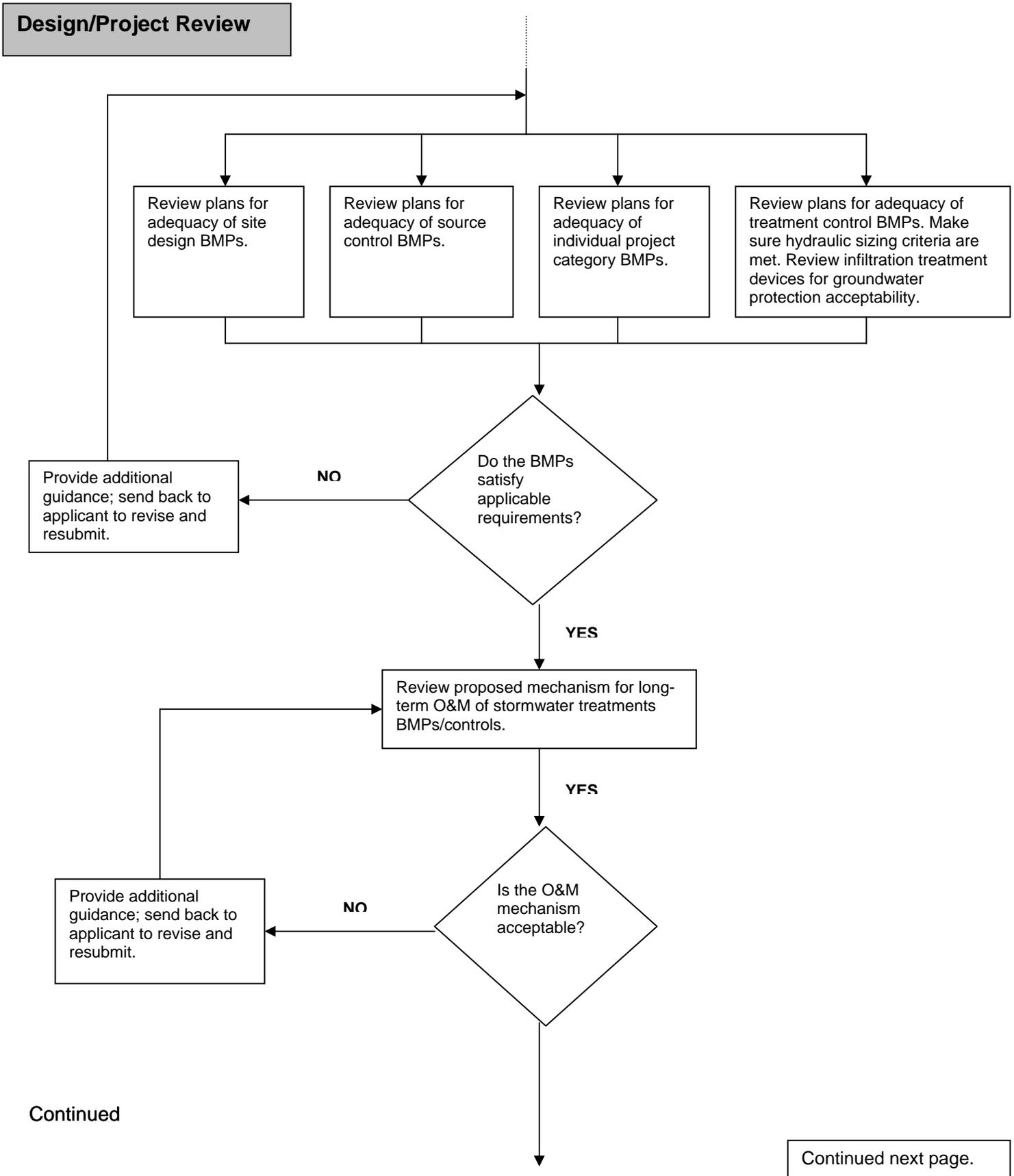
Conduct CEQA review including evaluation of water quality impacts per Post-Construction requirements.

Propose mitigation measures consistent with Post-Construction requirements resulting from CEQA review.

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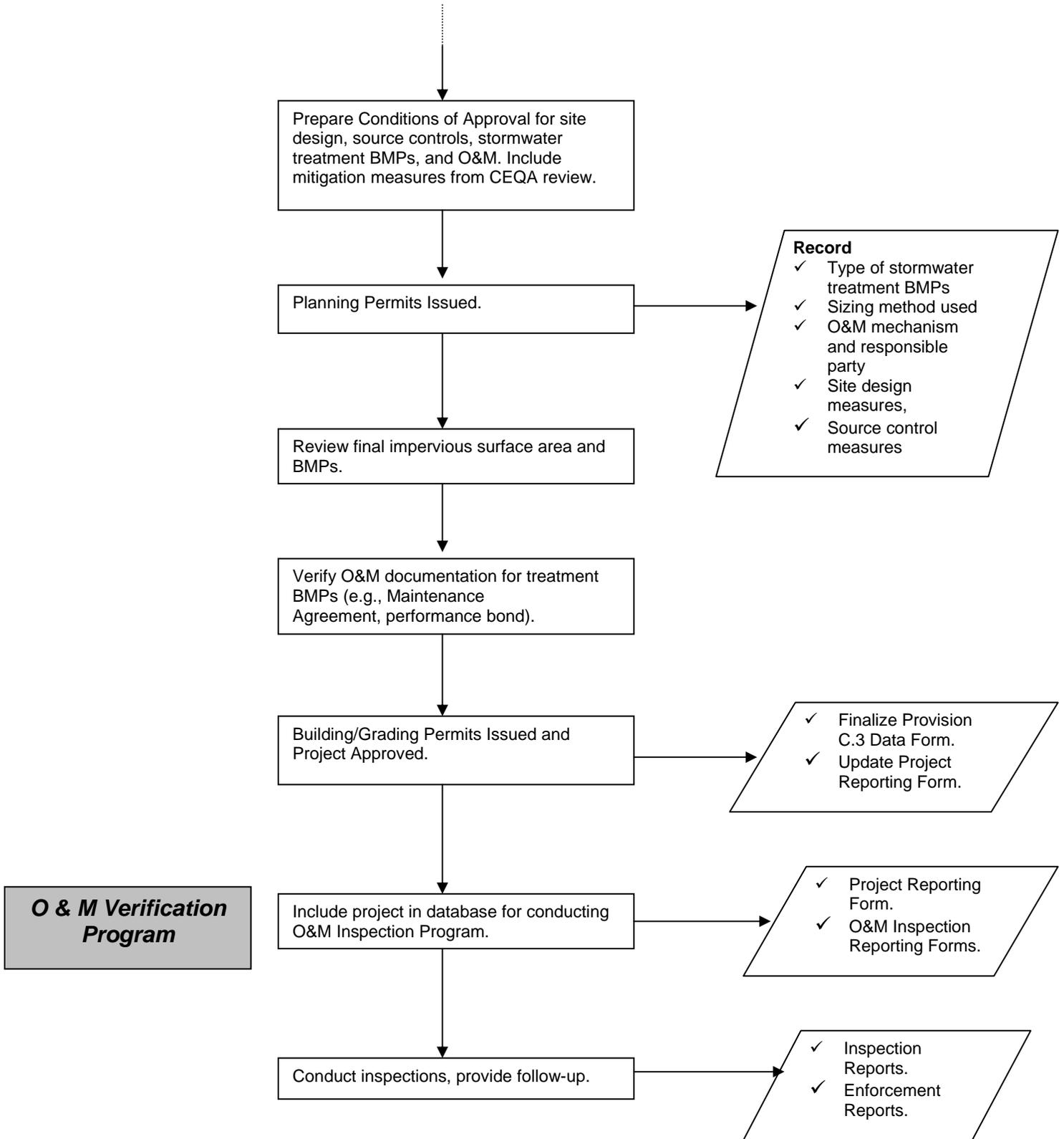
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NAPA COUNTY CONSTRUCTION SITE RUNOFF CONTROL REQUIREMENTS
APPENDIX D – DEVELOPMENT PLAN REVIEW PROCESS FOR DISCRETIONARY PERMITS



**NAPA COUNTY
POST-CONSTRUCTION RUNOFF MANAGEMENT
REQUIREMENTS**

APPENDIX E

SOURCE CONTROL BMP SELECTION WORKSHEET

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

APPENDIX E – SOURCE CONTROL BMP SELECTION WORKSHEET

All Standard and Priority Projects must complete and sign the Source Control BMP Selection Worksheet and submit it with their Stormwater Runoff Management Plan (SRMP).

Date of Application: _____

Type of Application: Use Permit Building Permit Grading Permit

Project Location or Address: _____

Project Name: _____

Property Owner Name: _____

Applicant's Name: _____

Owner Contractor Engineer/Architect Developer

Applicant's Address: _____

Applicant's Phone: _____ **Fax:** _____ **E-mail:** _____

Parcel/Tract #: _____ **Lot #:** _____ **APN:** _____

Fill out the table below to indicate which Source Control BMPs in Chapter 4.2 apply to your project.

Check box to indicate proposed activity	Land Use/Activities	Limited Exclusion (Check box if project is excluded)	Source Control BMP Standard
	Roads and driveways.	None	4.2.A
	Parking Areas	None	4.2.B
	New or Reconstructed Stormwater Conveyance Systems	None	4.2.C
	Storm drain Inlets and open channels or creeks.	<input type="checkbox"/> Detached Residential Homes	4.2.D
	Landscaping	None	4.2.E
	Trash Storage Areas.	<input type="checkbox"/> Detached Residential Homes	4.2.F
	Pools, Spas, and Fountains.	None	4.2.G
	Roofs, Gutters, and Downspouts.	None	4.2.H
	Loading and Unloading Dock Areas	None	4.2.I
	Outdoor Material Storage Areas.	<input type="checkbox"/> Detached Residential Homes	4.2.J
	Processing Areas.	None	4.2.K
	Vehicle and Equipment Repair and Maintenance Areas	<input type="checkbox"/> Detached Residential Homes	4.2.L
	Vehicle and Equipment Wash Areas	<input type="checkbox"/> Detached Residential Homes	4.2.M
	Food Service Equipment Cleaning	None	4.2.N
	Interior Floor Drains.	None	4.2.O
	Fueling Areas.	None	4.2.P

Incorrect information on proposed activities or uses of a project may delay your project application(s) or permit(s).

I declare under penalty of perjury, that to the best of my knowledge, the information presented herein is accurate and complete.

Name of Owner or Agent (Please Print):	Title:
Signature of Owner or Agent:	Date:

**NAPA COUNTY
POST-CONSTRUCTION RUNOFF MANAGEMENT
REQUIREMENTS**

APPENDIX F

TREATMENT CONTROL BMP SELECTION WORKSHEET

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

APPENDIX F - TREATMENT CONTROL BMP SELECTION WORKSHEET

This worksheet was developed to help you with the selection of a Treatment Control BMP or combination of Treatment Control BMPs to remove anticipated pollutants, to the maximum extent practicable, from stormwater runoff generated during the use of the project. All project applications subject to Treatment Control BMP requirements must submit this worksheet with their SRMP.

Date of Application: _____

Project Number:

Type of Application: Use Permit Building Permit Grading Permit

(For county Use Only)

Project Location or Address: _____

Project Name: _____

Property Owner Name: _____

Applicant's Name: _____

Owner Contractor Engineer/Architect Developer

Applicant's Address: _____

Applicant's Phone: _____ **Fax:** _____ **E-mail:** _____

Parcel/Tract #: _____ **Lot #:** _____ **APN:** _____

Step 1: Determine Anticipated Pollutants of Concern

Use the table below to determine the types of anticipated pollutants your project may generate based on land use type.

CHECK BOX TO INDICATE PROPOSED LAND USE	PROJECT POLLUTANT SOURCES	POLLUTANTS OF CONCERN	If you checked a box next to a land use that may potentially generate a pollutant or stressor, explain why that pollutant or stressor is or is not anticipated to be generated by the proposed project.
	Lawns, Landscaping, and Parks	Sediment (coarse and fine) Nutrients (dissolved and particulate) Pesticides, pathogens, trash and debris	
	Parking Lots and Driveways	Sediment (fine) Metals (dissolved and particulate) TPH, trash	
	Roads and Highways	Sediment (coarse and fine) Metals (dissolved and particulate) TPH, PAH, trash and debris	
	Food-Related Commercial	Pathogens, oil and grease	
	Animal-Related Commercial	Pathogens	
	Auto-Related Commercial	Metals (dissolved and particulate) TPH, PAH, surfactants	
	Industrial	Sediment (coarse and fine) Metals (dissolved and particulate) TPH, PAH, PCB, pH, surfactants	

Step 2: Determine Conditions of Concern for Receiving Waters

Check off the watershed your project is located in to determine the conditions of concern downstream from your project. This information will help you select treatment control BMP(s) that maximize the removal of pollutants that are already impairing downstream receiving waters.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

APPENDIX F - TREATMENT CONTROL BMP SELECTION WORKSHEET

Treatment Control BMP Selection Matrix.

Note: The Treatment control BMP Selection Matrix is provided for guidance purposes only. The performance of any given BMP may depend on the pollutant loading generated as well as local site conditions such as soil type and topography. The selection process must take into account the suitability of the BMP for the site. Alternative treatment control BMPs not identified in the matrix below may be approved at the discretion of the Director, provided the alternative BMP is as effective, or more effective, in the removal of pollutants of concern as other feasible BMPs listed in the matrix.

BMP Type	BMP	Constituent/Performance (G = Good, F = Fair, P = Poor)										
		Coarse Sed	Fine Sed	NO ₃	Total N	Total P	Pb	Zn	Cu	Pathogens	Oil and Grease	Trash and Debris
Detention Basins	Wet Pond	G	G	P	F	F	G	G	F	F	NR	G
	Extended Wet Pond	G	G	F	F	G	G	G	P	F	NR	G
	Extended Dry Pond	G	F	P	F	P	F	F	F	P	NR	G
Water Quality Wetlands	Shallow Wetlands	G	G	F	P	F	F	G	F	G	NR	G
	Extended Detention Wetland	G	G	F	P	F	F	G	F	G	NR	G
Biofilters (Horizontal)	Bioswale	G	F	P	F	F	G	F	F	P	F	F
	Filter Strip	G	F	P	F	F	G	F	F	P	F	F
Filters (Vertical)	Sand Filter	G	G	P	F	F	G	G	F	F	G	G
	Media Filter	G	G	P	F	F	G	G	G	F	F	NR
	Bioretention	G	G	P	G	G	G	G	G	P	G	NR
Solid Separators	Rotational Flow	G	F	P	F	F	F	F	F	P	G*	G
	Multi-Chamber	F	P	P	F	P	F	F	P	P	F	G
Inserts	Catch Basin Insert	G	F	P	F	F	F	F	F	P	G*	G

Incorrect information on proposed activities or uses of a project may delay your project application(s) or permit(s).

I declare under penalty of perjury, that to the best of my knowledge, the information presented herein is accurate and complete.

Name of Owner or Agent (Please Print):	Title:
Signature of Owner or Agent:	Date:

**NAPA COUNTY
POST-CONSTRUCTION RUNOFF MANAGEMENT
REQUIREMENTS**

APPENDIX G

VECTOR CONSIDERATIONS FOR STORMWATER CONTROLS

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

APPENDIX G – VECTOR MANGEMENT CONSIDERATIONS FOR STORMWATER BMPs

BACKGROUND

The Napa County Mosquito Abatement District (NCMAD) has the responsibility for providing enforcement of mosquito control measures when public health is threatened. It is concerned with the spread of insects and other nuisance pests that could result from poorly designed and/or maintained structures, especially those containing standing water. Detention basins, water quality wetlands and infiltration basins are examples of stormwater treatment control structures that may offer prime breeding habitats for mosquitoes and other nuisance pests if not properly designed and maintained. Stagnant water associated with stormwater treatment can provide habitat for the aquatic stages of mosquitoes. NCMAD and other California vector control districts are particularly concerned that the expanding number of treatment controls may result in increased mosquito habitat at the same time as the potential arrival of West Nile Virus. Napa County is working with the NCMAD to develop favorable treatment control design standards.

USING SITE DESIGN TO MINIMIZE MOSQUITO VECTOR CONTROL CONCERNS

Proper site design offers an excellent opportunity to minimize stormwater impacts and mosquito threats by minimizing the treatment controls needed, and by properly designing and placing those that are needed to reduce potential vector impacts. Based on available literature and current BMP implementation strategies nationwide, the following general principles for proper site designs should be considered.

- **Preserve natural drainage.** This reduces the amount of stormwater runoff and provides for natural on-site runoff control. This can reduce the number of structural BMP measures required.
- **Improve designs of permanent pools.** Reduce mosquito habitat: increase circulation and provide deeper water depths. Stock permanently flooded systems with mosquito fish to foster biological predation on mosquito larvae.
- **Select stormwater management measures based on site-specific conditions.** Designs that take into account site conditions tend to improve drainage and limit the occurrence of stagnant water.
- **Attend to ponds that temporarily impound water.** Facilities that pond water for an extended period (e.g., dry ponds, and man-made wetlands) should drain water completely within seventy-two (72) hours of a storm event. Avoid placement of dry ponds and underground structures in areas where they are likely to remain wet (i.e., high water tables). Principal outlets should have positive drainage.¹
- **Properly design storm sewer systems.** The sheltered environment in-side storm drains can promote mosquito breeding. Design and construct pipes for a rate of flow that flushes the system of sediment and prevents water backing up in the pipe. Construct storm drains so that the invert out is at the same elevation as the interior bottom to prevent standing water.
- **Properly maintain controls.** Any circumstances that restrict the flow of water from a system as designed should be corrected. Debris or silt buildup obstructing an outfall structure should be removed. Under-drains and filtration media should be inspected periodically and cleaned out or replaced as needed.

ADDRESSING VECTOR CONTROL CONSIDERATIONS IN STORMWATER TREATMENT BMPS.

While addressing stormwater quality via proper site design planning is the best method for minimizing long-term maintenance requirements and vector concerns, some projects still require stormwater treatment systems due to the size of the project. In such cases, project proponents should consider the

¹ In Napa County, there is no mosquito that will complete development in less than seven days, even during the warmest conditions. Once the mosquito reaches the pupal stage, it can complete development without water as long as the soil remains damp. Therefore, a realistic limit on the duration of standing water is five days, even allowing for a considerable margin of error.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

APPENDIX G – VECTOR MANGEMENT CONSIDERATIONS FOR STORMWATER BMPs

following standards when selecting and designing these systems for their site. Municipalities should review proposed stormwater treatment BMPs designs with vector control in mind.

Proper BMP Designs to Reduce or Eliminate Mosquito Production. NCMAD has identified several stormwater BMP maintenance objectives to reduce or eliminate mosquito production. These include the following:

- Minimize stagnant water (i.e., maintain constant exchange of water in systems);
- Minimize surface area (i.e., deeper water habitat is preferable);
- Keep wetland edges simple (e.g., steep banks with deep water);
- Prevent mosquito access to underground systems that may have standing water. Use siphons and sealed access to prevent mosquito access.
- Include mosquito net covering sand media filter pump sumps;
- Include aluminum “smoke proof” cover for any vault sedimentation basins;
- Use grouted rock energy dissipaters instead of loose rock; and
- Construct sites so that there is access to the water’s surface. Any underground site that might create mosquito habitat in stagnant water should have easy access for direct inspection and insecticidal treatment.

Vector-control personnel throughout the United States have found that aquatic habitats that last only three (3) to five (5) days generally do not allow for complete development of mosquito larvae². In addition, cold temperatures that often occur during the rainy season suppress mosquito production. In Napa County, with the exception of certain BMPs designed to hold permanent water (e.g. detention or wet ponds), all BMPs should drain completely within seventy-two (72) hours to effectively suppress vector production. Access for routine maintenance and vector control is also imperative in BMP design.

Improper BMP Design and Maintenance Can Lead to Additional Mosquito Production. Improper BMP selection, design, and maintenance contribute to mosquito production. Stormwater BMPs (and their associated structures and/or components) that may create a suitable habitat for mosquito production include:³

- Any BMP that clogs, improperly drains and/or collects debris;
- Catch basins and settling basins that are exposed;
- Effluent pipes with small diameter discharge orifices prone to clogging;
- Loose riprap;
- Pumps or motors designed to automatically drain water from structures;
- Retention ponds, continuous deflective separation (CDS) units, Delaware sand filters, multi-chambered treatment trains (MCTT), wet basins and other BMPs that maintain a pool of standing water;
- Sumps, catch basins and settling basins that are covered or located below ground;
- Sumps, catch basins, spreader troughs or other BMPs that do not drain completely; and,
- Underground detention systems, sumps or other BMPs that are unsealed or have openings.

² Metzger et al., 2003

³ This list may not be totally inclusive of all stormwater BMPs that provide potential habitats for mosquitoes.

NAPA COUNTY POST-CONSTRUCTION RUNOFF MANAGEMENT REQUIREMENTS

APPENDIX G – VECTOR MANGEMENT CONSIDERATIONS FOR STORMWATER BMPs

ADDITIONAL RESOURCES FOR GUIDANCE ON VECTOR CONTROLS

Additionally, the following materials regarding mosquitoes and factors contributing to mosquito production within BMPs may be obtained from the Napa County Stormwater Management Program website (www.napastormwater.org):

- *The Dark Side of Stormwater Runoff Management: Disease Vectors Associated with Structural BMPs;*
- *Stormwater Treatment Devices as Potential Breeding Grounds for Disease Carriers;*
- *Disease Vectors Associated with Stormwater Treatment Devices in California;*
- *The Downside of Stormwater Runoff Management: Disease Vectors & Structural BMPs in Southern California.*