

City of San Diego



TRANSPORTATION  
& STORM WATER

**2016**

# STORM WATER STANDARDS

## **Part 3: Offsite Storm Water Alternative Compliance Program For Water Quality and Hydromodification Control**

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# OFFSITE STORM WATER ALTERNATIVE COMPLIANCE PROGRAM

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# OFFSITE STORM WATER ALTERNATIVE COMPLIANCE PROGRAM

## Summary

Part 3 of the Storm Water Standards addresses the Offsite Storm Water Alternative Compliance Program (Offsite Alternative Compliance Program) developed by the City of San Diego (City) to allow mitigation of Priority Development Project (PDP) storm water impacts through implementation of offsite structural BMPs. This program allows for offsite control of water quality and hydromodification impacts, provides design options and flexibility in the case of site infeasibility, and provides the potential for more effective regional storm water control solutions to improve watershed-scale water quality.

As provided by the MS4 Permit (Order No. R9-2013-0001 as amended by Order No. R9-2015-001 and Order No. R9-2015-0100), the City has the discretion to allow PDPs to transfer onsite storm water control obligations to an offsite project under specified conditions. This section describes the process and requirements that PDPs must follow to qualify for consideration under the City's Offsite Alternative Compliance Program, which will be developed in two phases.

**Phase 1:** The first phase of program implementation allows consideration of applicant implemented projects. In this initial phase, the project applicant implements an offsite alternative compliance project (ACP) and is fully responsible for the project's design, construction, operation, and long-term maintenance. Phase 1 projects would be designed to directly offset PDP impacts. No credit trading and/or banking will be allowed in the Phase 1 program. PDP applicants will have the option to participate in the Phase 1 program beginning **February 16, 2016**.

**Phase 2:** The second phase of the program allows PDP applicants and/or independent entities to implement, fund or partially fund an offsite ACP. Phase 2 participation is provided through either an in-lieu fee or a credit system. An in-lieu fee system allows project proponents to provide direct payments for funding of water quality and/or hydromodification control projects. A credit system allows for the exchange of credits between PDPs and credit-generating projects implemented by the City or private entities. For example, a project proponent that is able to treat a greater amount of area than required would potentially generate excess credits. These credits could then be purchased by other projects applicants in the watershed. Phase 2 is dependent on development of a credit system, which requires approval by the San Diego Regional Water Quality Control Board (SDRWQCB). Development of the Phase 2 program is currently in progress.

**Storm Water Standards - Part 3 is organized as follows:**

**Chapter 1** provides the regulatory background that allows development of the Offsite Alternative Compliance Program.

**Chapter 2** provides an overview of the City's Offsite Alternative Compliance Program.

**Chapter 3** discusses Phase 1 details.

**Chapter 4** discusses Phase 2 details.

**Appendices** to Storm Water Standards - Part 3 provide guidance and worksheets for calculating water quality equivalency, as well as applicable agreements and associated forms required for submittal to the City for project consideration.

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# OFFSITE STORM WATER ALTERNATIVE COMPLIANCE PROGRAM

## List of Acronyms

ACP	Alternative Compliance Project
BMP	Best Management Practice
DCIA	Directly Connected Impervious Area
DCV	Design Capture Volume
MS4	Municipal Separate Storm Sewer System
NSMP	Natural System Management Practices
PDP	Priority Development Project
SDRWQCB	San Diego Regional Water Quality Control Board
SWQMP	Storm Water Quality Management Plan
WMA	Watershed Management Area
WMAA	Watershed Management Area Analysis
WQE	Water Quality Equivalency
WQIP	Water Quality Improvement Plan

# OFFSITE STORM WATER ALTERNATIVE COMPLIANCE PROGRAM

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## Permit Requirements

The Municipal Separate Storm Sewer System (MS4) Permit (Order No. R9-2013-0001 as amended by Order No. R9-2015-001 and Order No. R9-2015-0100) provides the City of San Diego (City) discretion to allow priority development project (PDP) applicants to transfer onsite obligations to implement pollutant control and hydromodification controls to an offsite project under specific conditions. This is referred to in the MS4 Permit as the alternative compliance program to onsite structural best management practice (BMP) implementation (from herein referred to as the “Offsite Alternative Compliance Program”). This chapter summarizes the conditions specified in the MS4 Permit for program participation.

### 1.1. Introduction

#### *MS4 Permit Provision E.3.c.(3)*

The City has the option to develop an Offsite Alternative Compliance Program through which PDP applicants may be allowed to implement structural BMP control obligations offsite. Such offsite controls would be installed in lieu of meeting the performance standards onsite for pollutant and/or hydromodification control for either the full, or a portion of the, water quality treatment volume or hydromodification flow control obligation.

The Offsite Alternative Compliance Program was developed recognizing that full adherence to the MS4 Permit’s onsite requirements may not be feasible for all projects. This approach also facilitates the integration of watershed-scale solutions for improving overall water quality.

Functionally, participation in the Offsite Alternative Compliance Program would allow a PDP applicant to fulfill the requirement of meeting water quality and/or hydromodification performance standards indicated in Part 1 of the Storm Water Standards with:

- Onsite flow-thru treatment control BMPs and
- Offsite mitigation of the design capture volume (DCV) not retained or biofiltered onsite and/or the hydromodification flow control obligation not achieved onsite.

PDP applicants may participate in the program via two pathways. They can either supplement onsite controls that do not fully satisfy the applicable performance standards or elect to proceed directly to an offsite compliance option in lieu of onsite compliance (see Storm Water Standards - Part 1, Section 1.8).

To be considered for participation in the Offsite Alternative Compliance Program, requirements detailed in subsequent **Sections 1.2, 1.3, and 1.4** must be met.

## Chapter 1: Permit Requirements

### 1.2. Watershed Management Area Analysis

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#### *MS4 Permit Provision B.3.b.(4)*

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As a prerequisite for allowing an Offsite Alternative Compliance Program, the MS4 Permit requires the City to perform a Watershed Management Area Analysis (WMAA) and include results in the applicable Water Quality Improvement Plans (WQIPs) within its jurisdiction. The City has satisfied the permit-required WMAA requirement as part of regional WMAA effort. The applicable analyses have been included in the WQIPs submitted to the SDRWQCB. Comprised of watershed-specific data and analyses presented as GIS layers, the WMAA analyses can be used to inform the identification and selection of potential “candidate projects” within the watershed.

### 1.3. Greater Overall Water Quality Benefit

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#### *MS4 Permit Provision E.3.c.(3)(a)*

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The MS4 Permit requires that offsite projects provide a “greater overall water quality benefit” for the portion of pollutants and/or flow control not fully mitigated onsite. This benefit is compared against the default condition of full mitigation onsite. The overall water quality benefit of a potential offsite project must be consistent with the approved Water Quality Equivalency (WQE) guidance document for the San Diego Region (Region 9).

This document provides currency calculations needed to assess water quality and hydromodification management benefits for a variety of potential offsite project types. The WQE document provides regional and technical basis for demonstrating a greater overall water quality benefit for the watershed. This approved WQE guidance document can be downloaded from the Project Clean Water website. The application of the WQE guidance document in the City’s Offsite Alternative Compliance Program is discussed further in Section 2.5 and Appendix A.

### 1.4. Other Permit Requirements

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#### *MS4 Permit Provision E.3.c.(3)(b)*

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The MS4 Permit also requires projects utilizing the Offsite Alternative Compliance Program criteria to comply with the following:

- **Location restrictions** – For water quality pollutant control, the offsite project must be in the same watershed management area as the PDP. For hydromodification control, additional location restrictions apply (see Section 2.6).
- **Operations and Maintenance** - Permanent structural BMPs require on-going inspection and maintenance into perpetuity to preserve the intended pollutant control and/or flow control performance. Projects utilizing the Offsite Alternative Compliance Program must demonstrate proof of the mechanism under which perpetual operation and maintenance will be performed.



- **Design requirements** – Design of the offsite project must be prepared by an appropriately qualified professional (e.g. engineer) competent and proficient in the field of storm water engineering.
- **Construction timing requirements** – Projects utilizing Offsite Alternative Compliance Program criteria must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first PDP utilizing the offsite facility. A longer period of time could be authorized by the SDRWQCB Executive Officer.
- **Temporal mitigation** – If a PDP is allowed to utilize a proposed offsite project to be constructed after the certificate of occupancy of the PDP, then temporal mitigation is required for the pollutant loads and altered flows discharged from the PDP prior to completion of the offsite project.

### 1.5. Mechanisms for Alternative Compliance

The MS4 Permit provides several mechanisms for funding and/or implementing potential offsite projects. These include:

- Watershed Management Area Analysis Candidate Projects
- Project Applicant Proposed Projects
- In-Lieu Fee Structure
- Water Quality Credit System

Each mechanism is discussed in the following sections.

#### 1.5.1 Watershed Management Area Analysis Candidate Projects

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##### *MS4 Permit Provision E.3.c.(3)(b)*

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The City WQIPs included a WMAA (Section 1.2) with a list of potential candidate projects that could be utilized by PDP applicants for alternative compliance projects. Candidate project lists are considered “living” lists for which project identification will be continually updated. The MS4 Permit allows the PDP applicant to fund, contribute funds to, or implement a candidate project listed in the WMAA provided the requirements in Sections 1.3 and 1.4 are met. PDP applicants electing to fund or contribute funds to a candidate project must follow the in-lieu fee structure described in Section 1.5.3.

#### 1.5.2 Project Applicant Proposed Projects

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##### *MS4 Permit Provision E.3.c.(3)(c)*

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The MS4 Permit provides PDP applicants an option to propose an alternative compliance project not identified in the WMAA and partially, fully fund and/or implement it as an offsite project provided it meets the requirements in Sections 1.3 and 1.4. PDP applicants electing to fund or contribute funds to an applicant proposed project must follow the in-lieu fee structure described in Section 1.5.3.

## Chapter 1: Permit Requirements

### 1.5.3 In-Lieu Fee Structure

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#### *MS4 Permit Provision E.3.c.(3)(d)*

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The MS4 Permit allows the City to develop an in-lieu fee structure to allow a PDP applicant to fund or partially fund a candidate project (see Section 1.5.1) or an alternative compliance project proposed by the applicant (see Section 1.5.2). This step is required to ensure that funds obtained from a project owner (private or public) are sufficient for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The MS4 Permit requires that collected funds be transferred to the City (for public projects) or to an escrow account (for private projects) prior to the construction of the PDP. The in-lieu fee structure will be available with Phase 2 of the Offsite Alternative Compliance Program.

### 1.5.4 Water Quality Credit System

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#### *MS4 Permit Provision E.3.c.(3)(e)*

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The MS4 Permit provides the City an option to develop and implement a water quality credit system, provided that the credit system demonstrates it will not allow discharges from PDPs to cause or contribute to a net impact over and above the impact caused by projects meeting onsite structural BMP performance requirements. A credit system would provide a mechanism for PDP applicants to participate in the Offsite Alternative Compliance Program by trading water quality and hydromodification credits.

Through this system, a project applicant would calculate the generated water quality credits of an offsite project using the Water Quality Equivalency guidance. Once the credit quantity is established and confirmed, the credit owner can apply credits toward meeting water quality requirements at another project site within the same watershed. Project owners with excess credits (i.e., credits in excess of PDP requirements) may also be allowed to bank the credits and then sell or trade them to another entity within the watershed. The MS4 Permit requires review and acceptance of the credit system by the SDRWQCB Executive Officer prior to implementation.

The credit system will be available with Phase 2 of the Offsite Alternative Compliance Program.

## City's Offsite Storm Water Alternative Compliance Program

This chapter provides an overview and requirements for participation in the City's Offsite Alternative Compliance Program.

### 2.1. Introduction

The City has elected to create and administer an Offsite Alternative Compliance Program. The program will enhance flexibility of developing property within the City's jurisdiction while concurrently incentivizing improvements to water quality in locations that otherwise may not have experienced water quality improvements.

With the program, PDP applicants that are unable to fully meet pollutant control or hydromodification control requirements of the MS4 Permit with onsite BMPs would have the ability to participate in the implementation of offsite projects to satisfy the requirements.

Participation in the Offsite Alternative Compliance Program is optional and does not guarantee that projects will be in compliance with storm water pollutant control and hydromodification requirements. Additionally, participation in the program may or may not provide a more cost effective compliance pathway as compared to traditional onsite storm water control practices.

### 2.2. Onsite and Offsite BMPs

**For private projects,** onsite BMPs are defined as control measures implemented to mitigate changes to storm water quality (pollutant load) and quantity (hydromodification flow rates and durations) of runoff from a development project before the runoff enters an MS4. Examples of control measures include infiltration BMPs, biofiltration BMPs, flow control facilities, etc. If the BMP receives runoff from a development project through an MS4, then it is considered as an offsite BMP for that development project. Exceptions to offsite BMP determination may apply, based on project-specific determination at the discretion of the City Engineer.

**For public projects,** onsite BMPs are defined as control measures implemented to mitigate changes to storm water quality (pollutant load) and quantity (hydromodification flow rates and durations) of runoff from a development project before the runoff a storm drain and/or a receiving water. Examples of control measures include infiltration BMPs, biofiltration BMPs, flow control facilities, etc. If the BMP receives runoff from a development project through a storm drain and/or a receiving water, then it is considered an offsite BMP for that development project. Exceptions to offsite BMP

## Chapter 2: City's Offsite Storm Water Alternative Compliance Program

determination may apply, based on project specific-determination at the discretion of the City Engineer.

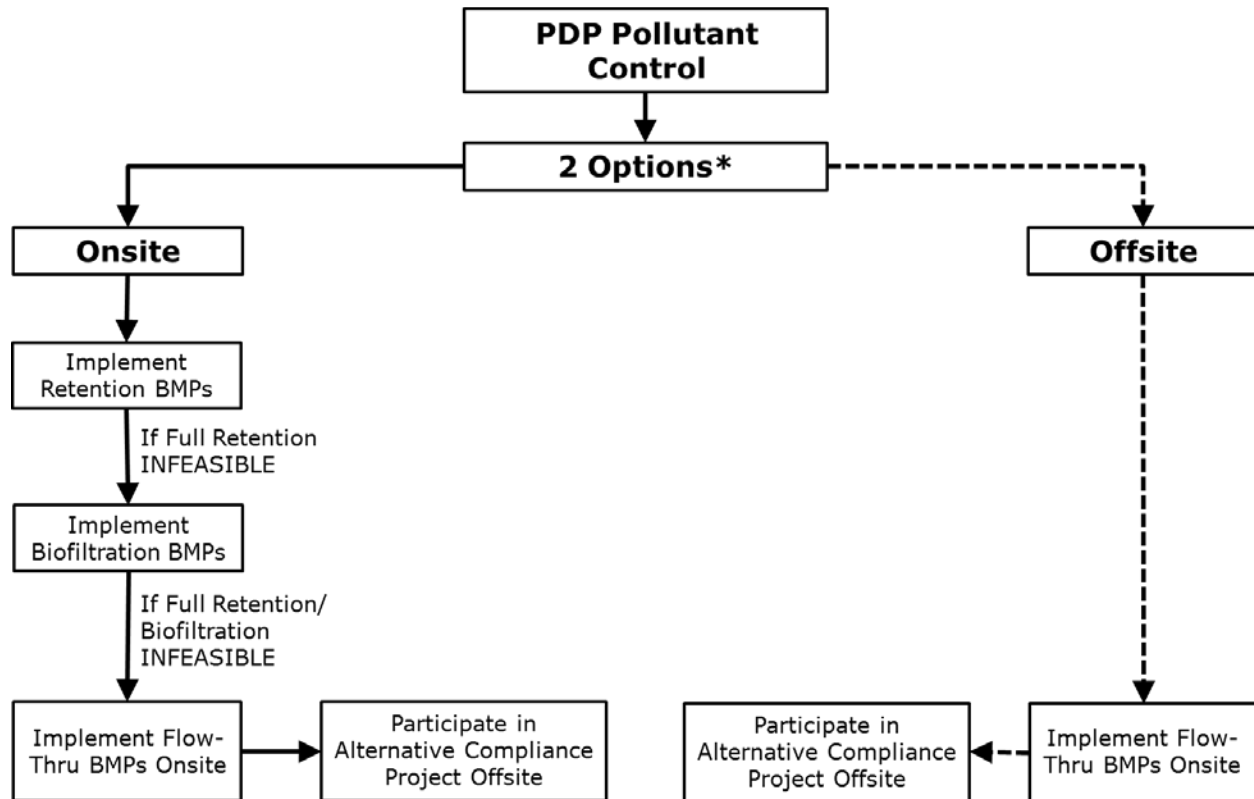
PDPs may be allowed to participate in the Offsite Alternative Compliance Program by using onsite BMPs to treat offsite runoff at the discretion of the City Engineer. Specific guidelines and requirements for using onsite BMPs as part of the Offsite Alternative Compliance Program may be developed and added to this manual as approved by the City Engineer.

### 2.3. Participation Requirements

There are two distinct pathways available to PDP applicants that elect to participate in the City's Offsite Alternative Compliance Program to satisfy onsite pollutant and/or hydromodification control requirements:

- The first pathway is a supplement to onsite compliance. This path ultimately ends at offsite alternative compliance if the PDP cannot meet all of the onsite pollutant control and/or hydromodification control obligations. This pathway requires performing a feasibility analysis for retention and biofiltration BMPs prior to participation in the Offsite Alternative Compliance Program.
- The second pathway allows for PDPs to proceed directly to the Offsite Alternative Compliance Program without demonstrating infeasibility of retention and/or biofiltration BMPs onsite. If the PDP applicant chooses to meet a portion of pollutant control obligations onsite using either retention and/or biofiltration BMPs, then a feasibility analysis and the hierarchy of BMP selection defined in Storm Water Standards - Part 1 will be applicable for the portion of pollutant control obligation the applicant chooses to meet onsite.

Both pathways require onsite flow-thru treatment control BMPs (see Figure 2-1). Participation in the Offsite Alternative Compliance Program, and the obligation to implement onsite flow-thru treatment control BMPs for the DCV not reliably retained or biofiltered onsite, are linked and cannot be separated. Both pathways apply to Phase 1 and Phase 2 of the program.



\*PDP is allowed to directly participate in an offsite project without demonstrating infeasibility of retention and/or biofiltration BMPs onsite.

Figure 2-1. Pathways to Participating in Alternative Compliance Program

## 2.4. Phased Implementation

The City's Offsite Alternative Compliance Program will be implemented in two phases (see Figure 2-2).

**Phase 1:** The first phase of the Offsite Alternative Compliance Program implementation allows consideration of applicant implemented projects. In this initial phase, the project applicant implements an offsite alternative compliance project and is fully responsible for the project's design, construction, operation, and long-term maintenance. No credit trading and/or banking will be allowed in Phase 1. PDP applicants will have the option to participate in the Phase 1 program beginning **February 16, 2016**. Refer to **Chapter 3** for further guidance.

**Phase 2:** The second phase of the Offsite Alternative Compliance Program allows PDP applicants and/or independent entities to implement, fund or partially fund an alternative compliance project. Phase 2 participation is provided through either an in-lieu fee structure or through a credit system. An in-lieu fee system allows direct payments by project proponents to provide funding for water quality and/or hydromodification control projects. A credit system would allow credits generated through offsite projects implemented by the City or private entities to be exchanged. For example, a project proponent that is able to treat a greater amount of area than required would potentially generate excess credits which could then be purchased by other projects applicants in the watershed. This phase is dependent on formation of a SDRWQCB approved credit system.

## Chapter 2: City's Offsite Storm Water Alternative Compliance Program

Development of the Phase 2 program is in progress. Refer to **Chapter 4** for additional guidance.

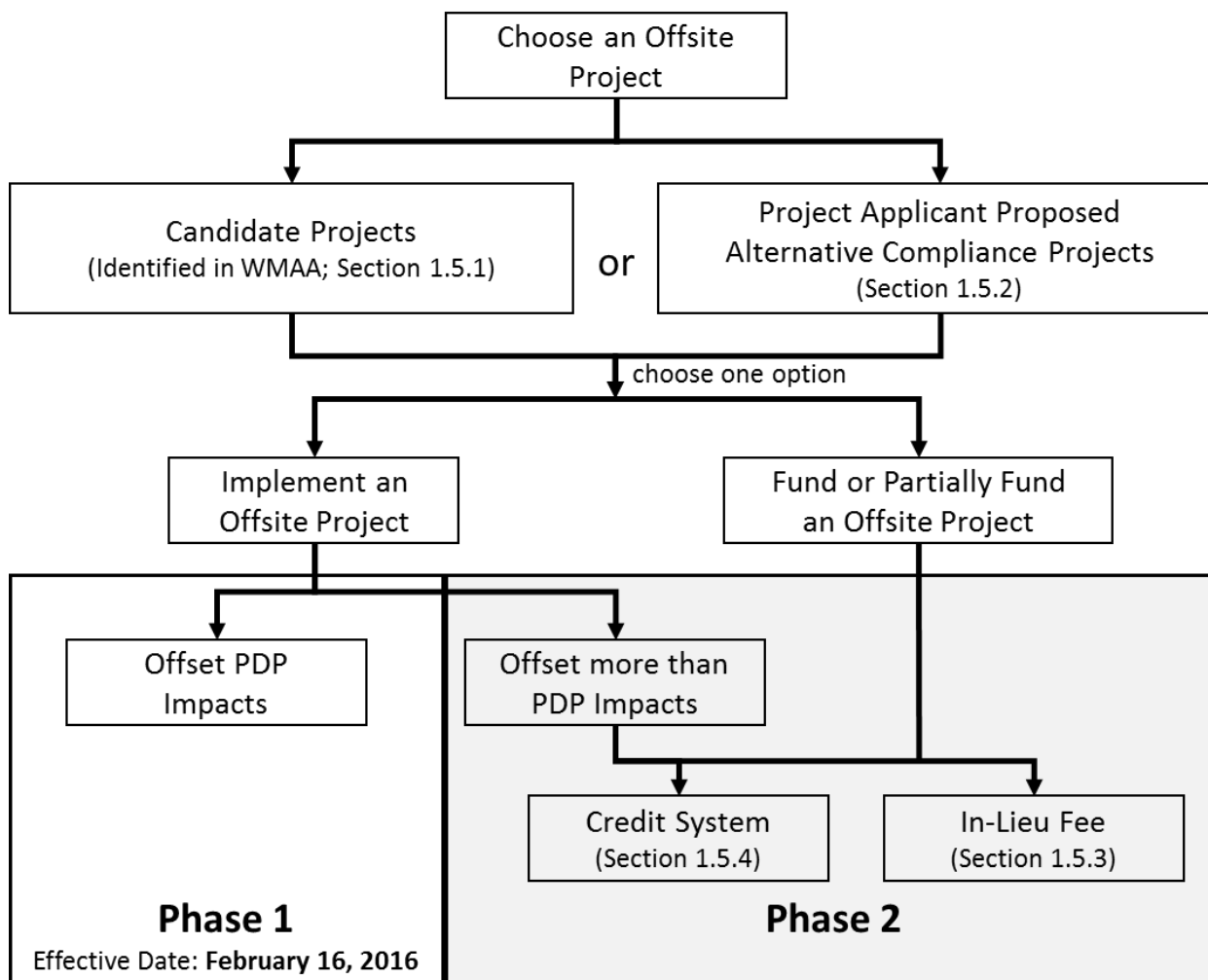


Figure 2-2 Phasing of the City Alternative Compliance Program

### 2.5. Water Quality Equivalency

The system of translating the deficit of onsite BMP implementation to greater overall benefits provided by an offsite alternative compliance project was developed under a joint effort by the City and the San Diego County Copermittees. This system is presented in the WQE guidance document, as approved by the SDRWQCB on December 17, 2015. These calculations are required for participation in the City's Offsite Alternative Compliance Program. The WQE guidance document calculations are categorized into two types of controls:

- **Pollutant control:** WQE for storm water pollutant control is based on a metric of storm water volume. The metric was developed based on the design capture volume (DCV), land use factor, and BMP efficacy factor to determine an earned pollutant control volume. The



## Chapter 2: City's Storm Water Alternative Compliance Program

earned pollutant control volume can then be credited toward PDP volume deficits calculated using the same parameters.

- **Hydromodification control:** WQE calculations for hydromodification control were developed based on mitigation of directly connected impervious area (DCIA). The rationale for selecting this currency is that mitigating one DCIA acre is as valuable as mitigating another DCIA acre, provided that strict requirements for the location of the alternative compliance project relative to the PDP are met. Three equivalency methods are provided: hydromodification flow control equivalency; PDP-based equivalency for stream rehabilitation; and watershed-based equivalency for stream rehabilitation.

Multiple storm water treatment strategies can be quantified through the WQE guidance document to equate onsite PDP deficits to offsite alternative compliance project benefits:

- **Structural vs. Natural**

**Structural BMPs** are a subset of BMPs which detain, retain, filter, remove, or prevent the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed. Structural BMPs include Retrofit BMPs, Regional BMPs, Groundwater Recharge and Water Supply Augmentation BMPs.

**Natural System Management Practices (NSMP)** are strategies implemented to restore and/or preserve predevelopment watershed functions in lieu of providing direct management of pollutant control and hydromodification flow control. NSMPs include Land Restoration, Land Preservation, and Stream Rehabilitation projects.

- **Pollutant Control, Hydromodification Management, or both**

An alternative compliance project may provide storm water pollutant control benefits, hydromodification flow control benefits, or a combination of the two. Certain types of BMPs tend to provide pollutant control or flow control benefits more effectively.

Table 2-1 summarizes in matrix form the available alternative compliance project choices that can be quantified in the WQE guidance document.

## Chapter 2: City's Offsite Storm Water Alternative Compliance Program

**Table 2-1: ACP Categories Quantified Through Water Quality Equivalency Guidance**

ACP Category		Stormwater Pollutant Control Benefits				Hydromod Flow Control Benefits
		Pollutant Reduction			Volume Reduction	
		Retention	Biofiltration	Flow-Thru		
BMP	Retrofit	Available	Available	Limited Availability	See Retention	Available
	Regional	Available	Available	Limited Availability	See Retention	Available
	Water Supply	Available	Available	Limited Availability	See Retention	Available
NSMP	Land Restoration	Not Available	Not Available	Not Available	Available	Available
	Land Preservation	Not Available	Not Available	Not Available	Limited Availability	Available
	Stream Rehabilitation	Not Available	Not Available	Not Available	Limited Availability	Available

Appendix A.1 (for pollutant control) and Appendix A.2 (for hydromodification control) provide procedures, forms and worksheets that the applicant must use for performing and documenting WQE calculations to show greater overall water quality benefit. At this time, Appendix A covers projects that are anticipated to be used for Phase 1. Applicants are advised to refer to the WQE guidance document for additional background on the methodologies and example project calculations.

Applicants have the option to use offsite approaches included in the WQE guidance document but not covered in Storm Water Standards - Part 3 (e.g., new approaches that may be developed after publishing the Storm Water Standards). These new approaches may be added to this manual in future editions as approved by the City Engineer.

### 2.6. Location Requirements

Location requirements for participation in Phase 1 or Phase 2 of the City's Offsite Alternative Compliance Program include the following:

- For **pollutant control**, the alternative compliance project must be within the City jurisdiction and the same watershed management area as the PDP.

## Chapter 2: City's Storm Water Alternative Compliance Program

- For **hydromodification flow control**, the alternative compliance project must be within the City jurisdiction and meet the location requirement relative to the PDP. Table 2-2 identifies the location requirements for different PDP scenarios.
- For **stream rehabilitation projects**, the project must be within the City jurisdiction and location requirements for the segments requiring rehabilitation must be determined using the channel assessment process described in the WQE guidance document.

Note: Private projects are not allowed to construct alternative compliance projects within public parcels and/or right-of-way, unless an exception to this requirement is granted by the City Engineer.

**Table 2-2: Alternative Compliance Project Location Requirements for Hydromodification Flow Control BMPs by PDP Scenario Type**

PDP Scenario Type	Alternative Compliance Project Location Requirements
<ul style="list-style-type: none"><li>• New Development</li><li>• Redevelopment Increasing Impervious Area</li></ul>	<ul style="list-style-type: none"><li>• Alternative compliance project location must be within the same local watershed/system (drains to the same susceptible receiving water as the PDP), AND</li><li>• Mitigation must be provided at or before the discharge point to the susceptible receiving water, AND</li><li>• The total existing DCIA draining to the alternative compliance project must be greater than or equal to the PDP DCIA to be mitigated (i.e., the drainage area draining to the alternative compliance project must generate as much or more runoff as the PDP area requiring mitigation).</li></ul>
<ul style="list-style-type: none"><li>• Redevelopment With NO Increase In Impervious Area.</li></ul>	<ul style="list-style-type: none"><li>• Alternative compliance project location must be within the same hydrologic unit but does not have to be within the same local watershed/system (may drain to a different susceptible receiving water within the same hydrologic unit), AND</li><li>• Alternative compliance project location must not be an HMP exempt location, AND</li><li>• The total existing DCIA draining to the alternative compliance project must be greater than or equal to the PDP DCIA to be mitigated (i.e., the drainage area draining to the alternative compliance project must generate as much or more runoff as the PDP area requiring mitigation).</li></ul>

### 2.7. Design Requirements

Alternative compliance projects must meet the design criteria in Part 1 and Part 2 of the Storm Water Standards except for numeric BMP sizing which should be based on Appendix A. For example, if an applicant is designing a biofiltration BMP as an alternative compliance project, then the BMP should be designed to meet the requirements in the fact sheets in Appendix E and F of Storm Water Standards - Part 1 except for numeric sizing of the BMP, which must be calculated using the WQE calculations in Appendix A to show greater overall water quality benefit.

Design of the offsite project must be prepared by an appropriately qualified professional (e.g. engineer) competent and proficient in the field of storm water engineering.

### 2.8. Other Requirements

- Requirements for operations and maintenance, construction timing requirements and temporal mitigation are anticipated to be different between Phase 1 and Phase 2. Requirements for Phase 1 are presented in **Chapter 3** and requirements for Phase 2 are presented in **Chapter 4**.
- Participation in the Offsite Alternative Compliance Program is only applicable to PDPs regulated under the 2013 MS4 permit. If a PDP is subject to requirements in the 2012 Storm Water Standards due to prior lawful approval (Storm Water Standards - Part 1, Section 1.10), then participation in the Offsite Alternative Compliance Project is not applicable.
- Projects that have approved discretionary permits with a design based on the 2012 Storm Water Standards will be subject to additional discretionary review and approval if they elect to redesign BMPs using this manual and participate in the Offsite Alternative Compliance Program during the ministerial permit process.
- The Offsite Alternative Compliance Program cannot be used by a PDP to meet the coarse sediment requirements defined in Section 6.2 of Storm Water Standards – Part 1.

## Phase 1 Offsite Storm Water Alternative Compliance Program

This phase of the Offsite Alternative Compliance Program is available to PDP applicants concurrent to the effective date (i.e. February 16, 2016) of the updated Storm Water Standards. Phase 1 allows PDP applicants to implement an offsite alternative compliance project to directly offset the PDP onsite storm water requirements. The PDP applicant is fully responsible for the project's design, construction, operation, and long-term maintenance. The offsite alternative compliance project being implemented in place of, or to supplement the PDP onsite implementation shall demonstrate through WQE calculations a greater overall water quality benefit as compared to onsite implementation.

### 3.1. Participation Steps

The process PDP applicants must follow to participate in the Phase 1 Offsite Alternative Compliance Program is detailed below:

1. **Project Selection:** The PDP applicant must select either a candidate project identified in the WMAA or propose a project not included in the WMAA as an alternative compliance project to offset the onsite storm water impacts (Section 3.2).
2. **WQE Calculations:** The PDP applicant must demonstrate, through WQE calculations, that the portion of the PDP storm water requirements not satisfied onsite is satisfied by the selected alternative compliance project (Section 3.3).
3. **Phase 1 Requirements:** The PDP applicant must provide documentation that the proposed alternative compliance project meets the Phase 1 requirements (Section 3.4).
4. **Phase 1 Submittal Requirements:** The PDP applicant shall submit information identified in Section 3.5 for City engineering review and acceptance.

Figure 3-1 presents the process for participating in the Phase 1 Offsite Alternative Compliance Program. A PDP is considered to be in compliance if it follows and implements the process indicated in the flow chart and provides the supporting technical guidance referenced in the flow chart.

## Chapter 3: Phase 1 Offsite Storm Water Alternative Compliance Program

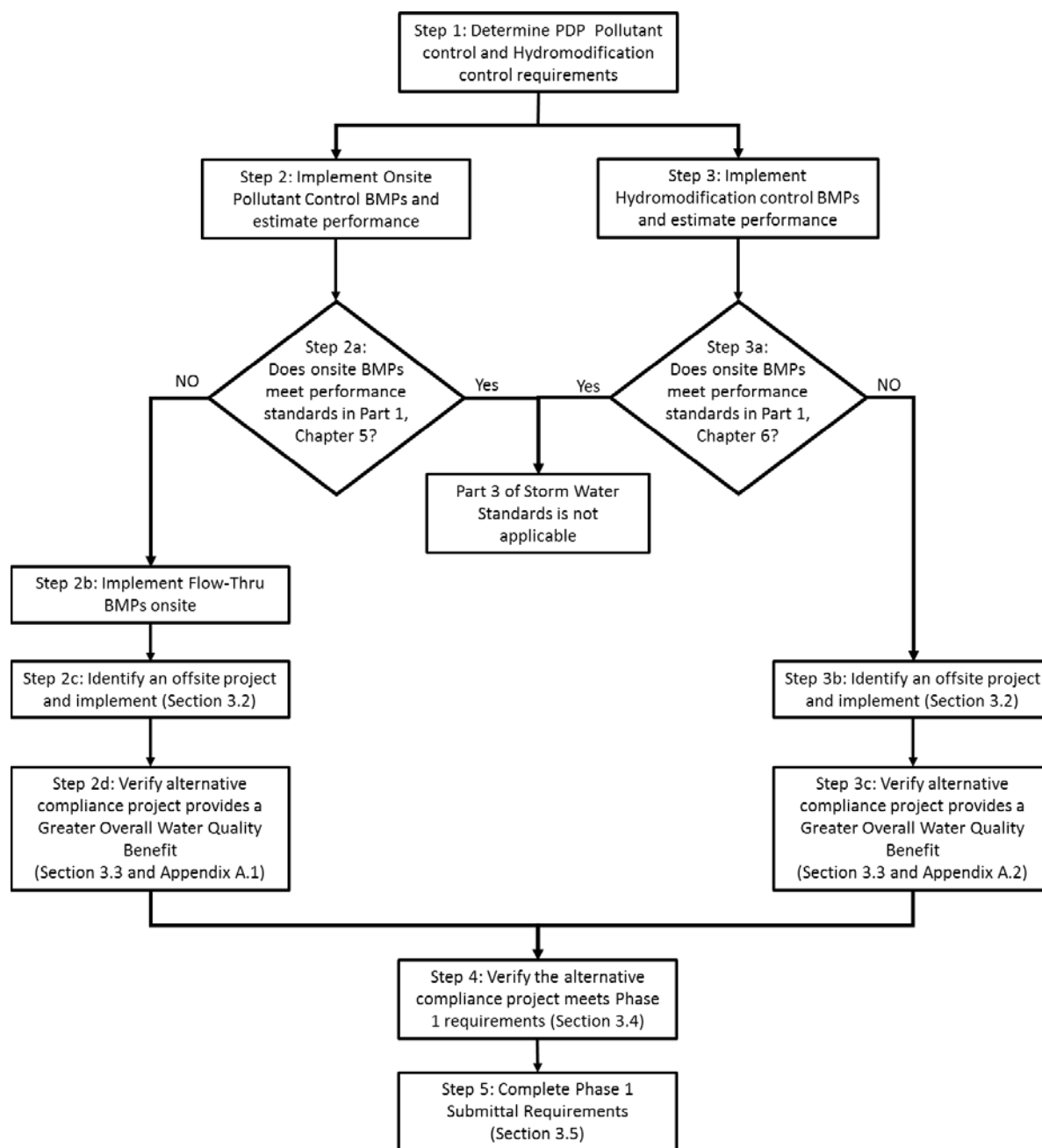


Figure 3-1. Phase 1 Alternative Compliance Program Process

### Description of Steps

- Step 1. Determine PDP pollutant control and hydromodification control requirements. Refer to Part 1 of the Storm Water Standards.
- Step 2. Implement onsite pollutant control BMPs and estimate performance. Use the worksheets provided in Appendix B of Storm Water Standards - Part 1 to estimate BMP performance and determine the portion of the DCV that is reliably retained and/or biofiltered onsite. If no retention and/or biofiltration BMPs are planned to be



### Chapter 3: Phase 1 Offsite Storm Water Alternative Compliance Program

implemented onsite, no portion of the DCV is reliably retained and/or biofiltered onsite.

- a. Determine if onsite pollutant control BMPs meet the performance standards presented in Storm Water Standards - Part 1, Chapter 5. If onsite pollutant control BMPs meet the performance standards, Storm Water Standards - Part 3 is not applicable for pollutant control. If onsite pollutant control BMPs do not meet the performance standards proceed to Step 2b.
  - b. Implement flow-thru BMPs onsite to provide flow-thru treatment for the portion of the DCV that is not reliably retained or biofiltered onsite. Refer to Storm Water Standards - Part 1, Chapter 5.
  - c. Identify and implement an offsite alternative compliance project. PDPs participating in Phase 1 of the Alternative Compliance Program may choose a candidate project from the WMAA associated with the PDP watershed. Alternatively, a PDP can also propose a project in the watershed that complies with the requirements of the Phase 1 program. Refer to Section 3.2.
  - d. Verify that the alternative compliance project provides a greater overall water quality benefit by demonstrating that the earned pollutant control volume is greater than or equal to the onsite DCV deficit. Refer to Section 3.3 and Appendix A.1 for WQE calculations and documentation.
- Step 3. Implement onsite hydromodification control BMPs and estimate performance. Use Storm Water Standards - Part 1, Appendix G and/or continuous simulation to estimate BMP performance and determine the portion of the PDP hydromodification requirement that is effectively mitigated. If no hydromodification control BMPs are planned to be implemented onsite, no portion of the PDP site is effectively mitigated.
- a. Determine if onsite hydromodification control BMPs meet the performance standards presented in Storm Water Standards - Part 1, Chapter 6. If onsite hydromodification control BMPs meet the performance standards, Storm Water Standards - Part 3 is not applicable for hydromodification control. If onsite hydromodification control BMPs do not meet the performance standards proceed to Step 3b.
  - b. Identify and implement an offsite alternative compliance project. PDPs participating in Phase 1 of the Alternative Compliance Program may choose a candidate project from the WMAA associated with the PDP watershed. Alternatively, a PDP can also propose a project in the watershed that complies with the requirements of the Phase 1 program. Refer to Section 3.2.
  - c. Verify that the alternative compliance project provides a greater overall water quality benefit by demonstrating that the earned DCIA credit is greater than or equal to the onsite DCIA deficit. Refer to Section 3.3 and Appendix A.2 for WQE calculations and documentation.
- Step 4. Verify that the alternative compliance project meets all of the Phase 1 requirements presented in Section 3.4.

## Chapter 3: Phase 1 Offsite Storm Water Alternative Compliance Program

- Step 5. Complete the additional Phase 1 submittal requirements to document WQE and compliance with the performance standards, refer to Section 3.5.

### 3.2. Project Selection

The City, through incorporation of the WMAA in the WQIPs, has identified a list of candidate projects in each watershed of the City's jurisdiction. These projects would be eligible for PDP applicants to implement as part of Phase 1 of alternative compliance program. The candidate project lists are included with the associated WQIPs and can be found on the City of San Diego Storm Water Division webpage<sup>1</sup> [*Note: permanent URL may be different*] as follows:

San Dieguito Watershed Water Quality Improvement Plan

- [San Dieguito Water Quality Improvement Plan](#)

Los Peñasquitos Watershed Water Quality Improvement Plan

- [Los Peñasquitos Water Quality Improvement Plan](#)

Mission Bay/La Jolla Watershed Water Quality Improvement Plan

- [Mission Bay/La Jolla Water Quality Improvement Plan](#)

San Diego River Watershed Water Quality Improvement Plan

- [San Diego River Water Quality Improvement Plan](#)

San Diego Bay Watershed Water Quality Improvement Plan

- [San Diego Bay Water Quality Improvement Plan](#)

Tijuana River Watershed Water Quality Improvement Plan

- [Tijuana River Water Quality Improvement Plan](#)

PDPs interested in implementing a candidate project from the WMAA should contact the City's Storm Water Department to inquire about the project as defined at the time of its listing on the candidate project list. Project purpose and definition should be coordinated between the PDP applicant and the City. This collaboration ensures that the goals of the City and the goals of the PDP are both met.

Alternately, the PDP may propose a project that meets the requirements of this Phase 1 Offsite Alternative Compliance Program and can demonstrate through WQE calculations to have a greater overall watershed water quality benefit.

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<sup>1</sup> <http://www.sandiego.gov/stormwater/regulations/newpermitprog/city.shtml>

### 3.3. WQE Calculations

PDP applicants must perform WQE calculations for the alternative compliance project and the PDP using guidance in:

- Appendix A.1 for pollutant control obligations; and/or
- Appendix A.2 for hydromodification control obligation.

Calculations must be documented using the worksheets in Appendix A.1 and A.2. For the PDP to meet the Phase 1 requirements the calculations must show that the alternative compliance project provides a greater overall watershed water quality benefit for the portion of the pollutants and/or flow control not fully mitigated onsite.

### 3.4. Phase 1 Requirements

This section presents requirements that the PDP must meet to participate in the Phase 1 Offsite Alternative Compliance Program:

- 1) Alternative compliance project is selected in accordance with the requirements in Section 3.2.
- 2) Alternative compliance project meets the location requirement described in Section 2.6.
- 3) Onsite flow-thru treatment control BMPs are implemented for the DCV not reliably retained and/or biofiltered onsite.
- 4) Alternative compliance project demonstrates a greater overall water quality benefit for the portion of the pollutants and/or flow control not fully mitigated onsite (Section 3.3).
- 5) Onsite BMPs are designed in accordance with design criteria in Storm Water Standards - Part 1 (Section 2.7). Alternative compliance project BMP sizing is designed in accordance with design criteria in Appendix A.
- 6) An easement is dedicated to the City for all offsite treatment/mitigation areas that offset the onsite storm water requirements. The easement must be labeled on entitlement documents as an “alternative compliance project easement”. This includes, but not limited to, BMPs, offsite site design BMPs, land restoration areas, stream rehabilitation projects, etc.
- 7) The PDP applicant submits separate maintenance agreements (DS-3247) for the alternative compliance project and onsite BMPs. The maintenance agreements must meet the requirements presented in Storm Water Standards - Part 1, Section 8.2.
- 8) The alternative compliance project is constructed before certificate of occupancy is granted to the PDP, unless a longer time is requested by the PDP applicant and is authorized by the City Engineer. A time period greater than 4 years will also require approval from the SDRWQCB Executive Officer.
  - For private projects, a time extension of 2 years for construction of an alternative compliance project may be approved by the City Engineer if the PDP applicant also meets the following criteria:
    - PDP application includes a performance bond for the construction of the alternative compliance project, with a 2-year time limit starting from the date of issuance of the certificate of occupancy of the PDP. The 2-year time limit

## Chapter 3: Phase 1 Offsite Storm Water Alternative Compliance Program

is intended to assure that the City will be able to demonstrate that PDP and alternative compliance project linkage is established within the permit-specified time limit of 4 years; and

- PDP applicant provides temporal mitigation for pollutant loads and altered flows that discharge from the PDP, to the satisfaction of the City Engineer.
- 9) PDP applicant submits a BMP self-certification form (DS-563) for the alternative compliance project and onsite BMPs.

### 3.4.1 Certificate of Occupancy

Certificates of Occupancy, or approved equivalent certifications, are issued upon approval of a final inspection when all work associated with a Building Permit is completed and the building is ready for occupancy. It is a violation of the Municipal Code to occupy a new building prior to issuance of a Certificate of Occupancy. The City of San Diego issues Certificates of Occupancy for the following uses:

- New commercial buildings
- New multi-family dwellings
- Tenant improvements (TIs) involving a change of occupancy
- Additional square footage to an existing structure or an increase in occupant load may require a Certificate of Occupancy for commercial and multi-family buildings.

The next edition of Storm Water Standards – Part 3 will define equivalent approvals to Certificate of Occupancy for other types of projects.

## 3.5. Phase 1 Submittal Requirements

The following submittal requirements apply to the PDP applicants electing to participate in the Phase 1 Offsite Alternative Compliance Program:

- PDP applicant must submit both the onsite PDP storm water control information and the offsite alternative compliance project information at the same time for project review.
- PDP applicant must complete and submit a Storm Water Quality Management Plan (SWQMP) using the template developed for the Storm Water Standards.
- All submittal requirements that would have applied to an onsite BMP in Chapter 8 of Part 1 of the Storm Water Standards would also apply to the offsite alternative compliance project. Additionally, the following submittal requirements must also be provided:
  - WQE calculations documented using the SWQMP template
  - Easement agreement for offsite benefit generating areas
  - Alternative compliance project construction performance assurance bond if the offsite project is not planned to be constructed before the PDP receives the certificate of occupancy.

### **Chapter 3: Phase 1 Offsite Storm Water Alternative Compliance Program**

- Summary of temporal mitigation provided if the alternative compliance project is not planned to be constructed before the PDP receives the certificate of occupancy.

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# OFFSITE STORM WATER ALTERNATIVE COMPLIANCE PROGRAM

## Chapter

# 4

## Phase 2 Offsite Storm Water Alternative Compliance Program

Development of the Phase 2 program is currently in progress.

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# OFFSITE STORM WATER ALTERNATIVE COMPLIANCE PROGRAM



## Water Quality Equivalency Sizing Guidance and Worksheets

The methodology including tables and worksheets included in this appendix are based on and consistent with the WQE Guidance Document approved by the SDRWQCB for Region 9. Included in this appendix are the applicable WQE forms that an applicant must use to document WQE calculations to demonstrate a greater overall water quality benefit for:

- A.1. Pollutant Control
- A.2. Hydromodification Control

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## A.1. Pollutant Control

The Earned Stormwater Pollutant Control Volume ( $V_E$ ) is the volume of water that is effectively treated by the alternative compliance project considering the site-specific factors presented in the Equation A-1:

$$V_E = L(\Delta V + V_2 B_2 - V_1 B_1) \quad \text{Equation A-1}$$

Where:

- $V_E$ : Earned Stormwater Pollutant Control Volume ( $\text{ft}^3$ )
- $L$ : Land Use Factor
- $\Delta V$ : Change in Design Capture Volume ( $V_1 - V_2$ )
- $V_1$ : Impacted Condition Design Capture Volume for alternative compliance project
- $V_2$ : Mitigated Condition Design Capture Volume for alternative compliance project
- $B_1$ : Impacted Condition BMP Efficacy Factor
- $B_2$ : Mitigated Condition BMP Efficacy Factor

The calculation of  $V_E$  is fundamentally the same for Structural BMPs and Natural System Management Practices; however, project-specific application differs between the two types of project categories. Section 3 of the WQE presents the steps calculate  $V_E$ . The following section provides a summary of the WQE methodology.

### 1. Calculate the DCV:

The DCV tributary to the alternative compliance project is determined through the same methodology outlined for PDPs in the BMP Design Manual (part 1). PDP applicants must determine DCV values for both impacted ( $V_1$ ) and mitigated ( $V_2$ ) alternative compliance project conditions and then calculate the difference between the two ( $\Delta V$ ).

### 2. Calculate the Land Use Factor (L):

The Land Use Factor is the ratio of pollutant concentrations generated by an alternative compliance project tributary compared to the pollutant concentrations generated by a reference PDP tributary with emphasis on the pollutants for which the receiving water in the watershed management area is impaired.

#### a. Identify WQE Pollutants of Concern:

Determine the WMA and hydrologic unit that the PDP is located within from Figure A-1 in Appendix A. Shapefiles of WMAs and hydrologic units are also available at <http://www.projectcleanwater.org/>. Select the WQE Pollutants of Concern corresponding to the PDP WMA and hydrologic unit from Table A-1 in Appendix A.

#### b. Quantify Relative ACP Pollutant Concentrations:

Delineate the area tributary to the alternative compliance project following the guidelines provided in Part 1. Overlay the event mean concentration (EMC) land use mapping data provided in Appendix A onto the ACP tributary area. Use Equation A-2 to determine the Relative alternative compliance project Pollutant Concentrations for each WQE Pollutant of Concern.

$$P_1 = \frac{\sum P_{1a} A_a C_a + P_{1b} A_b C_b + \dots + P_{1k} A_k C_k}{\sum P_{1a} A_a + P_{1b} A_b + \dots + P_{1k} A_k} \quad \text{Equation A-2}$$

Where:

$P_1$ : Relative Pollutant 1 Concentration for alternative compliance project tributary

$P_{1a} - P_{1k}$ : Relative Pollutant 1 Concentration for Land Use a-k respectively (Table A-2).

$C_a - C_k$ : Runoff Factor for Land Use a-k respectively (Table A-2).

$A_a - A_k$ : Area (sf) of Land Use a-k respectively.

### c. Quantify Relative Pollutant Concentrations for WQE Pollutants of Concern for the Reference Tributary:

For PDP applicant implemented alternative compliance project (Phase 1) the reference tributary is the tributary area of the actual PDP. Determine the relative pollutant concentrations for the WQE Pollutants of Concern for the reference tributary using the methodology presented in the previous step.

### d. Calculate the Land Use Factors:

The land use factor for each WQE pollutant of concern identified by the applicant is determined by dividing the relative ACP tributary concentration by the relative reference tributary concentration. Use the automated spreadsheet on the Project Clean Water site to determine the land use factor for each pollutant.

## 3. Calculate the BMP Efficacy Factors (B):

The BMP efficacy factor describes the ability of an alternative compliance project to remove pollutants in runoff from the drainage area. The efficacy factor is a function of two variables, the pollutant removal efficiency (E), and the provided capture (C). Equations for calculating the efficacy factor under different scenarios are provided in Section 2.4 of the WQE and are summarized below:

For a single retention, biofiltration, or flow-thru BMP:

$$B = E * C \quad \text{Equation A-3}$$

Where:

B: BMP Efficacy Factor

E: Pollutant Removal Efficiency

C: Provided Capture

For a single partial retention BMP:

$$B = E_r C_r + [(1.0 - E_r C_r) * E_b C_b] \quad \text{Equation A-4}$$

Where:

B: BMP Efficacy Factor

$E_r$ : Retention Pollutant Removal Efficiency

$E_b$ : Biofiltration Pollutant Removal Efficiency

$C_r$ : Retention Provided Capture

$C_b$ : Biofiltration Provided Capture

For a treatment train approach that combines multiple treatment elements into a single BMP:

$$B = E_1 C_1 + [(1 - E_1 C_1) * E_2 C_2] + [(1 - E_2 C_2) * E_3 C_3] \quad \text{Equation A-5}$$

Where:

B: BMP Efficacy Factor



$E_{1,2,3}$ : Pollutant Removal Efficiency (1 being most upstream and 3 being most downstream element)

$C_{1,2,3}$ : Provided Capture (1 being most upstream and 3 being most downstream element)

Note: Equation A-5 can be expanded to include additional elements if needed.

**a. Select BMP Efficiency Factor:**

Select the appropriate BMP efficiency factor based on BMP type from Table A-3.

**b. Determine Provided Capture (C):**

Calculation methods for provided capture vary based on the type of BMP selected. Select the appropriate method below based on BMP type.

**Option 1: Provided Capture for Retention BMPs**

As described, retention BMPs provide a pollutant removal efficiency of 1.00 across all pollutants. Therefore, BMP efficacy factors for retention BMPs vary only with respect to the provided capture of the BMP itself. Provided capture values for retention BMPs are a function of the fraction of the DCV retained and the subsequent BMP drawdown time. Provided capture values for retention BMPs must be determined as outlined below.

- 1) Determine the DCV of the alternative compliance project per Part 1.
- 2) Determine the DCV that is retained by the alternative compliance project.
- 3) Divide the Step 2 result by the Step 1 result to determine the fraction of the DCV that is retained by the alternative compliance project.
- 4) Determine the drawdown time for the proposed retention BMP per Part 1.
- 5) Utilize the curve presented in **Figure A-2** to determine the provided capture value as follows:
  - (i) Identify the fraction of DCV retained (from Step 3) along the x-axis and extend a line vertically up to the intersection with the specified drawdown time (from Step 4).
  - (ii) Extend a line horizontally from this intersect to the y-axis. This will identify the provided capture value (C) for the BMP. Depending on the provided drawdown time of the BMP, storm water pollutant reduction requirements may be completely satisfied through retention of anywhere between 0.40 times and 1.78 times the DCV.

**Option 2: Provided Capture for Biofiltration BMPs**

As described, biofiltration BMPs are assumed to provide a pollutant removal efficiency of 0.666 across all pollutants. Therefore, BMP efficacy factors for biofiltration BMPs simply vary with respect to the provided capture of the proposed biofiltration BMP. Provided capture values for biofiltration BMPs are a function of the fraction of DCV

biofiltered and do not consider drawdown times. Provided capture values for biofiltration BMPs must be determined as outlined below.

- 1) Determine the DCV of the alternative compliance project per Part 1.
- 2) Determine the DCV that is biofiltered by the alternative compliance project.
- 3) Divide the Step 2 result by the Step 1 result to determine the fraction of the DCV that is biofiltered by the alternative compliance project.
- 4) For biofiltration BMPs, the provided capture value is equivalent to the fraction of DCV that is biofiltered (Step 3), with a maximum allowable value of 1.50.

Biofiltration BMPs do not provide retention and ultimately release all intercepted flows via surface runoff or storm water conveyance. Because many of the BMPs used to satisfy storm water pollutant reduction requirements rely on surface biofiltration, a retention benefit associated with evapotranspiration is almost always realized even if the BMP is impermeably lined. If an alternative compliance project will provide both retention and biofiltration elements to satisfy storm water pollutant reduction requirements, the applicant should reference the partial retention BMP provided capture methodology outlined in Option 3. However, if the biofiltration BMP does not provide incidental retention or evapotranspiration, as would be the case for a BMP proposing pervious pavement with a subsurface impermeable liner, or if the applicant prefers to utilize a conservative and simplified calculation to determine the BMP provided capture value, the methodology outlined above should be utilized.

### **Option 3: Provided Capture for Partial Retention**

In some cases, a BMP may provide storm water pollutant reductions through a single BMP providing both retention and biofiltration mechanisms. As presented in Table A-3, partial retention BMPs provide pollutant removal efficiencies of 1.00 and 0.666 for the respective portions of retention and biofiltration provided. Therefore, BMP efficacy factors for partial retention BMPs vary with respect to the provided capture values for both retention and biofiltration. Provided capture values for partial retention BMPs must be determined as outlined below.

- 1) Determine the DCV of the alternative compliance project per Part 1.
- 2) Determine the DCV that is retained by the alternative compliance project.
- 3) Divide the Step 2 result by the Step 1 result to determine the fraction of the DCV that is retained by the alternative compliance project.
- 4) Determine the drawdown time for the proposed retention BMP per Part 1.
- 5) Utilize the curve presented in Figure A-2 to determine the provided capture value.
  - a) Identify the fraction of DCV retained (from Step 3) along the x-axis and extend a line vertically up to the intersection with the specified drawdown time (from Step 4).
  - b) Extend a line horizontally from this intersect to the y-axis. This will provide the provided capture value (C) for the BMP. Depending on the provided drawdown time of a proposed retention BMP, storm water pollutant reduction

requirements may be completely satisfied through retention of anywhere between 0.40 times and 1.78 times the DCV.

- 6) Determine the equivalent fraction of DCV retained with a 36-hr drawdown.
  - a) Prior to moving on to the biofiltration portion of the BMP, the provided capture value must be correlated to the fraction of the DCV retained with a 36-hour drawdown. To do so, the applicant must identify the point on the y-axis identified in Step 5b, extend a line laterally to the intersect with the 36-hour drawdown curve, then extend a line vertically down to the x-axis and read the associated fraction of DCV retained. This value is the equivalent fraction of DCV retained with 36-hour drawdown.
- 7) Determine the remaining DCV available for biofiltration
  - a) The remaining DCV available for biofiltration is calculated as [Step 1 x (1.00 – Step 6a)].
- 8) Determine the design capture volume that is biofiltered by the alternative compliance project.
- 9) Determine the fraction of the design capture volume that is biofiltered by the alternative compliance project (Step 8/Step 7).
- 10) The provided capture for the biofiltration portion of the BMP is equal to the value determined in Step 9.

### **Option 4: Provided Capture for Flow-thru BMPs:**

Flow-thru BMPs cannot characterize an appropriate provided capture value through a correlation with DCV. Instead applicants must establish provided capture values with respect to the fraction of the tributary water quality flow rate that is effectively treated by the flow-thru BMP (Appendix B.6, Part 1). At the discretion of the City Engineer applicants may propose alternative provided capture curves, refer to Section 2.3.1.3.2.5 of the WQE.

### **Option 5: Provided Capture for Treatment Train BMPs:**

To determine the provided capture values for each element of the treatment train, applicants should utilize the same fundamental methodologies presented in the sections above with slight modifications necessary to consider the cumulative effects of the treatment train approach, these modifications include consideration of the effects of retention in upstream BMP elements and conversion between volume and flow-based BMP elements. Refer to Section 2.3.1.3.2.5 of the WQE for additional information.

#### **c. Calculate the BMP Efficacy Factor (B):**

Based on the results of Parts a and b above, determine the BMP efficacy factor by inputting the E and C factors into the appropriate efficacy factor equation.

#### **4. Calculate the Earned Stormwater Pollutant Control Volume (VE):**

## Appendix A: Water Quality Equivalency Sizing Guidance and Worksheets

Based on the results of the land use factor and BMP efficacy factor calculate the earned storm water pollutant control volume. When multiple WQE pollutants of concern are identified, the land use and BMP efficacy factors should be based on the controlling pollutant, i.e. the lowest value calculated for the range of pollutants. Selecting the lowest factors produces the lowest Earned Stormwater Pollutant Control Volume. This in turn produces the most conservative results, which will ensure that the greatest overall water quality benefit is provided.

PDP applicants must use either **Worksheet A.1-1** or **Worksheet A.1-2** to document greater overall water quality benefit for pollutant control.

## Appendix A: Water Quality Equivalency Sizing Guidance and Worksheets

Pollutant Control Equivalency for Alternative Compliance Projects (Detailed Worksheet, need to hand calculate retention and provided capture)			Worksheet A.1-1	
Change in Design Capture Volume, $\Delta V$ for the alternative compliance project				
1	DCV for the impacted condition, V1 (from Part 1, Worksheet B.2-1)			cubic-feet
2	DCV for the mitigated condition, V2 (from Part 1, Worksheet B.2-1)			cubic-feet
3	Change in DCV, $\Delta V$ (Line 1-Line 2)			cubic-feet
Additional DCV Calculations (perform for selected BMP category only)				
4	DCV retained by alternative compliance project	Retention		cubic-feet
5	Fraction of DCV retained by alternative compliance project (Line 4/Line 2)	Retention		
6	DCV biofiltered by the alternative compliance project	Biofiltration		cubic-feet
7	Fraction of DCV biofiltered by alternative compliance project (Line 6/Line 2)	Biofiltration		
8	DCV retained by alternative compliance project	Partial Retention		cubic-feet
9	Fraction of DCV retained by alternative compliance project (Line 8/Line 2)	Partial Retention		
10	Equivalent fraction of DCV retained within 36-hour drawdown	Partial Retention		cubic-feet
11	Fraction of DCV biofiltered by the alternative compliance project	Partial Retention		
12	Fraction of tributary water quality flowrate effectively treated	Flow-thru		
14	DCV retained by alternative compliance project	Treatment Train		cubic-feet
15	Fraction of DCV biofiltered by alternative compliance project	Treatment Train		
Provide any notes on DCV calculations:				

## Appendix A: Water Quality Equivalency Sizing Guidance and Worksheets

Pollutant Control Equivalency for Alternative Compliance Projects (Detailed Worksheet, need to hand calculate retention and provided capture)		Worksheet A.1-1	
Calculate the Land Use Factor (L)			
Use the automated spreadsheet at <a href="http://projectcleanwater.org">projectcleanwater.org</a> to calculate L for each applicable WQE pollutant of concern.			
WQE Pollutant of Concern ( From Table 2-1)		Applicable (Y/N)	L (unitless)
16	TSS		
17	TP		
18	TN		
19	TCu		
20	TPb		
21	TZn		
22	FC		
23	Controlling L (minimum of Lines 16 through 22)		
Calculate the BMP Efficacy Factors (B)			
<b>Single retention, biofiltration, or flow-thru BMP</b>			
24	Pollutant removal efficiency, E (Table 2-3)		
25	Provided Capture, C (Figure 2-3)		
26	BMP Efficacy Factor, B <sub>2</sub> (Line 24 x Line 25)		
<b>Single partial retention BMP</b>			
27	Retention Pollutant Removal Efficiency, E <sub>r</sub> (Table 2-3)		
28	Retention Provided Capture (Figure 2-3)		
29	Biofiltration Pollutant Removal, E <sub>b</sub> (Table 2-3)		
30	Biofiltration Provided Capture (Figure 2-3)		
31	BMP Efficacy Factor, B <sub>2</sub> (Line 27 x Line 28 + [(1- Line 27 x Line 28) x (Line 29 x Line 30)])		
<b>Treatment train BMP</b>			
		1	2
33	Pollutant Removal Efficiency, E (1=most upstream, 3=most downstream)		

## Appendix A: Water Quality Equivalency Sizing Guidance and Worksheets

Pollutant Control Equivalency for Alternative Compliance Projects (Detailed Worksheet, need to hand calculate retention and provided capture)		Worksheet A.1-1		
34	Provided Capture, C (1=most upstream, 3=most downstream)			
35	BMP Efficacy Factor, B ( $E_1C_1 + [(1-E_1C_1) \times E_2C_2] + [(1-E_1C_1-E_2C_2) \times E_3C_3]$ )			
36	<b>B<sub>2</sub></b> (Select from Lines 26, 31, or 35)			
37	<b>B<sub>1</sub></b> (Select 0 if no existing BMPs on ACP, repeat Lines 24-35 if ACP site has existing BMPs that will remain operational after completion of project).			
Earned Pollutant Control Volume ( $V_E$ )				
36	Earned Pollutant Control Volume, $V_E$ (Line 23*[ Line 3 +Line 2 x Line 36 – Line 1 * Line 37 ])			



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## Appendix A: Water Quality Equivalency Sizing Guidance and Worksheets

Pollutant Control Equivalency for Alternative Compliance Projects (Simplified Worksheet, but depended on the WQE spreadsheets from Project Clean Water)		Worksheet A.1-2		
Change in Design Capture Volume, $\Delta V$ for the alternative compliance project				
1	DCV for the impacted condition, V1 (from Part 1, Worksheet B.2-1)		cubic-feet	
2	DCV for the mitigated condition, V2 (from Part 1, Worksheet B.2-1)		cubic-feet	
3	Change in DCV, $\Delta V$ (Line 1-Line 2)		cubic-feet	
Calculate the Land Use Factor (L)				
4	Land use factor (L) from Project Clean Water automated spreadsheet			
Determine the BMP Efficacy Factor (B)				
		Applicable Y/N	$B_1$	$B_2$
5	Retention BMP efficacy factor (from WQE Worksheet A.1)			
6	Biofiltration BMP efficacy factor (from WQE Worksheet A.2)			
7	Partial Retention BMP efficacy factor (from WQE Worksheet A.3)			
8	Treatment Train BMP efficacy factor			
9	Flow-thru BMP efficacy factor			
Earned Pollutant Control Volume ( $V_E$ )				
10	Line 4 x ( Line 3 + Line 2 x $B_2$ – Line 1 x $B_1$ )		cubic-feet	

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Supporting Tables and Figures for Pollutant Control Equivalency Calculations

**Table A-1: WQE Pollutants of Concern by Watershed Management Area and Hydrologic Unit**

Hydrologic Unit	Watershed Management Area	TSS	TP	TN	TCu	TPb	TZn	FC
San Dieguito (905.00)	San Dieguito River		X	X				X
Penasquitos (906.00)	Penasquitos	X	X	X				X
Penasquitos (906.00)	Mission Bay	X	X	X				X
San Diego (907.00)	San Diego River		X	X				X
Pueblo (908.00)	San Diego Bay		X	X	X	X	X	X
Sweetwater (909.00)	San Diego Bay		X	X	X			X
Otay (910.00)	San Diego Bay	X		X	X			X
Combined (908.00-910.00)	San Diego Bay	X	X	X	X	X	X	X
Tijuana (912.00)	Tijuana River	X	X	X				X

**Table A-2: Relative Pollutant Concentrations and Default Runoff Factors by Land Use**

Land Use Category	Default Runoff Factor	(1) TSS	(2) TP	(3) TN	(4) TCu	(5) TPb	(6) TZn	(7) FC
(a) Agriculture	0.10	0.45	1.00	1.00	1.00	1.00	0.59	1.00
(b) Commercial	0.80	0.13	0.16	0.16	0.56	0.48	1.00	0.87
(c) Education	0.50	0.13	0.20	0.11	0.14	0.25	0.39	0.13
(d) Industrial	0.90	0.13	0.19	0.15	0.54	0.68	0.89	0.49
(e) Multi-Family Residential	0.60	0.10	0.13	0.13	0.14	0.15	0.29	0.27
(f) Orchard	0.10	0.18	0.17	0.67	1.00	1.00	0.59	0.11
(g) Rural Residential	0.30	1.00	0.51	0.14	0.10	0.71	0.13	0.19
(h) Single Family Residential	0.40	0.13	0.20	0.15	0.27	0.43	0.35	0.63
(i) Transportation	0.90	0.11	0.26	0.12	0.53	0.31	0.62	0.12
(j) Vacant/Open Space	0.10	0.16	0.10	0.10	0.12	0.10	0.10	0.10
(k) Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Table A-3: Reference Key for Determination of Appropriate BMP Efficiency Factors**

BMP Type	Pollutant Removal Efficiency (E)
Retention	1.00
Biofiltration	0.666
Partial Retention	1.00 for retention portion 0.666 for biofiltration portion
Flow-Thru	Currently unknown, refer to WQE Section 2.3.1.3.1 for a framework to establish values. Proprietary BMP efficiency (%) must be established by third party testing protocol. When multiple pollutants of concern are present the BMP efficacy factor must be based on the controlling pollutant (i.e. the smallest fraction of removal so it is protective of water quality)
Treatment Train	Values from rows above



Figure A-1: Watershed Management Area and Hydrologic Unit Map

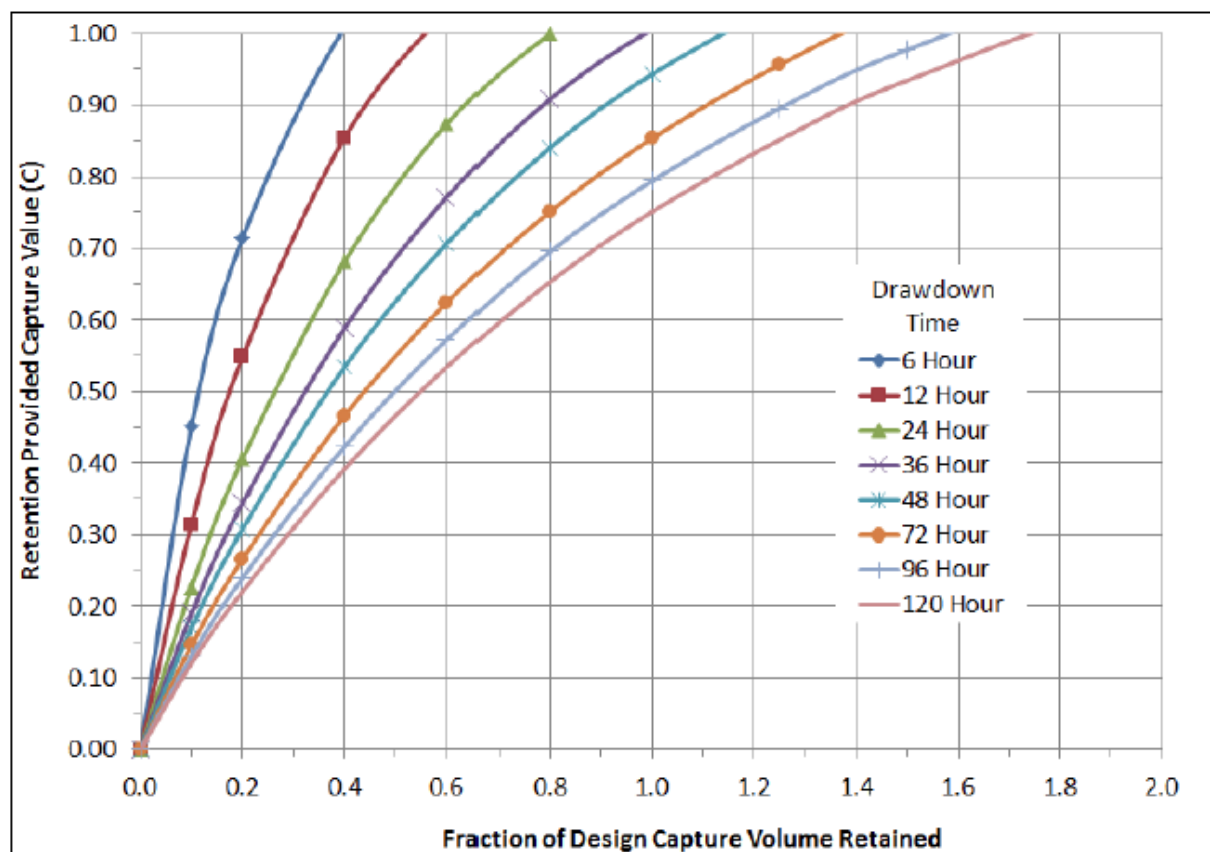


Figure A-2: Provided Capture Curves for Retention BMPs

## A.2. Hydromodification Control

### A.2.1. Equivalency for Hydromodification Flow Control

The metric for hydromodification flow control equivalency is acres of DCIA. Equivalency is based on a 1:1 ratio of unmitigated to mitigated acres of DCIA, and requires that strict requirements for the location of the ACP relative to the PDP are met. Table 2-1 in Chapter 2 identifies the location requirements for different PDP scenarios. PDP applicants must use **Worksheet A.2-1** to document greater overall water quality benefit for hydromodification flow control.

### A.2.2. Equivalency for Stream Rehabilitation Projects

Stream rehabilitation alternative compliance projects potentially allow PDPs to satisfy the hydromodification requirements of the MS4 permit, but are treated differently than other hydromodification management alternative compliance projects. This is because they do not offset DCIA and therefore cannot be quantified by the DCIA metric. Instead of providing flow-duration controls, the goal of stream rehabilitation projects is to provide an engineered channel that is “stable” or has “minimal potential for erosion” under the post-development condition. PDPs choosing to meet the hydromodification management requirements through stream restoration projects must demonstrate that the restoration project will create a stable system that discharges to an existing exempt system (i.e., an exempt water body, an exempt river reach, or an existing storm drain system or concrete-lined channel that extends all the way to an exempt water body or exempt river reach). Conversely, the study reach cannot discharge to a non-exempt channel segment prior to discharge to the exempt system. WQE guidance document details the methodology by which PDPs can demonstrate stability of the proposed channel rehabilitation alternative compliance project. PDP applicants must use **Worksheet A.2-2** to document greater overall water quality benefit for stream rehabilitation projects.



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## Appendix A: Water Quality Equivalency Sizing Guidance and Worksheets

Hydromodification Flow Control Equivalency for Alternative Compliance Projects			Worksheet A.2-1
PDP Hydromodification Flow Control Deficit			
1	Onsite DCIA (Sum of Impervious and Semi-Pervious Areas)		acres
2	Effectively Managed DCIA ( Portion of Line 1 that is Managed Onsite)		acres
3	Deficit of Total Impervious Area Effectively Managed (Line 1 – Line 2)		acres
Location Requirements			
PDP Project Scenario		Applicable Location Requirements	Satisfied (Y/NA)
4	New Development	<ul style="list-style-type: none"> <li>ACP location must be within the same local watershed/system (drains to the same susceptible receiving water as the PDP), AND</li> <li>Mitigation must be provided at or before the discharge point to the susceptible receiving water.</li> </ul>	
5	Redevelopment Increasing Impervious Area		
6	Redevelopment NOT Increasing Impervious Area	<ul style="list-style-type: none"> <li>ACP location must be within the same hydrologic unit but does not have to be within the same local watershed/system (may drain to a different susceptible receiving water within the same hydrologic unit), AND</li> <li>ACP location must not be an HMP exempt location.</li> </ul>	
Existing DCIA Effectively Managed or Mitigated by ACP			
7	Option 1: DCIA within Actual ACP Drainage Area		acres
8	Option 2: Estimate Total Existing Impervious Area using California Impervious Surface Coefficients. Estimate Subset of Existing DCIA using Sutherland EIA Equations.		acres
Earned DCIA Effectively Managed			
9	Line 7 or Line 8		acres
10	Greater Overall Water Quality Benefit (Line 9 – Line 1, must be greater than or equal to 0)		acres

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## Appendix A: Water Quality Equivalency Sizing Guidance and Worksheets

Hydromodification Flow Control Equivalency for Stream Rehabilitation Alternative Compliance Projects					Worksheet A.2-2	
Stream Rehabilitation Hydromodification Equivalency Scenario						
1	Applicant Implemented PDP-Based Rehabilitation Project (No credits generated)				<input type="checkbox"/> Yes	<input type="checkbox"/> No
2	Watershed-Based Stream Rehabilitation Project (Credit generation possible; Not applicable in Phase 1)				<input type="checkbox"/> Yes	<input type="checkbox"/> No
Estimate Geomorphic Stability of Receiving Waters (SCCWRP Channel Assessment Results)						
GCU ID		SCCWRP Rating Existing Conditions	SCCWRP Rating Future Conditions	Requires Rehabilitation		
4		Vertical		Vertical		<input type="checkbox"/> Yes <input type="checkbox"/> No
		Lateral		Lateral		
		Response to Urbanization		Response to Urbanization		
5		Vertical		Vertical		<input type="checkbox"/> Yes <input type="checkbox"/> No
		Lateral		Lateral		
		Response to Urbanization		Response to Urbanization		
6		Vertical		Vertical		<input type="checkbox"/> Yes <input type="checkbox"/> No
		Lateral		Lateral		
		Response to Urbanization		Response to Urbanization		
7		Vertical		Vertical		<input type="checkbox"/> Yes <input type="checkbox"/> No
		Lateral		Lateral		
		Response to Urbanization		Response to Urbanization		
8		Vertical		Vertical		<input type="checkbox"/> Yes <input type="checkbox"/> No
		Lateral		Lateral		
		Response to Urbanization		Response to Urbanization		
9	Copy rows above as needed for additional GCUs					

## Appendix A: Water Quality Equivalency Sizing Guidance and Worksheets

Hydromodification Flow Control Equivalency for Stream Rehabilitation Alternative Compliance Projects				Worksheet A.2-2	
Estimate Geomorphic Stability of Receiving Waters after Rehabilitation (SCCWRP Channel Assessment Results based on Rehabilitated State)					
	Existing GCU ID (From Rows 4-9)	Rehabilitated GCU ID	Rehabilitated Susceptibility Under Future Conditions		Acres of Tributary DCIA
9			Vertical		
			Lateral		
			Response to Urbanization		
10			Vertical		
			Lateral		
			Response to Urbanization		
11	Copy rows above as needed for additional GCUs				
Credits Generated (Complete if Response to Line 2 is "Yes")					
12	Total Credits (Sum of Lines 9 through 11)				