

Appendix J.2

Preliminary Water Quality
Management Plan
MSA Consulting, Inc.

Project Specific Preliminary Water Quality Management Plan

For: **The Oasis at Indio**

Southwest Corner of Avenue 42 and Monroe Street, Indio, CA 92203

DEVELOPMENT NO. **APNS 610-020-001, 610-020-010, 610-020-012, 610-020-013, 610-020-021, 610-020-034, AND 610-020-036**

DESIGN REVIEW NO. **N/A**

Prepared for:

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Original Date Prepared: September 1, 2023

Revision Date(s): N/A

OWNER'S CERTIFICATION

This project-specific Water Quality Management Plan (WQMP) has been prepared for:
Commercial Lighting Industries, Inc. for the project known as **TTM No. 38799 - The Oasis at Indio** located at the Southwest Corner of Avenue 42 and Monroe Street, in the City of Indio.

This WQMP is intended to comply with the requirements of **City of Indio** for **TTM No. 38799**, which includes the requirement for the preparation and implementation of a project-specific Final WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Indio (Indio Code of Ordinances – Title 15: Land Usage, §162.140).

If the undersigned transfers its interest in the subject property/project, the undersigned shall notify the successor in interest of its responsibility to implement this WQMP.

"I, the undersigned, certify under penalty of law that I am the owner of the property that is the subject of this WQMP, and that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

Owner's Printed Name

Owner's Title/Position

Date

**1111 Santa Monica Boulevard, Suite 600
Los Angeles, CA 90049**

ATTEST

Notary Signature

Printed Name

Title/Position

Date

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I. Project Description

Project Owner: Commercial Lighting Industries, Inc.

11111 Santa Monica Boulevard, Suite 600
Los Angeles, CA 90049
(To Be Provided)

WQMP Preparer: Michael Rowe, PE

34200 Bob Hope Drive
Rancho Mirage, CA 92270
(760) 323-7893

Project Site Address: Southwest Corner of Avenue 42 and Monroe Street
Indio, CA 92203

Planning Area: N/A

Community Name: City of Indio

Development Name: TTM No. 38799 - The Oasis at Indio

APN Number(s): 610-020-001, 610-020-010, 610-020-012, 610-020-013, 610-020-021, 610-020-034, 610-020-036

Latitude & Longitude: 33.74160, -116.24120

Receiving Water: Coachella Valley Stormwater Channel

Hydrologic Area: 182.06

Standard Industrial Classification (SIC) Code(s):

To Be Determined

Formation of Home Owners' Association (HOA)
or Property Owners Association (POA):

Y ☒ N ☐

POA or HOA potentially applicable to residential land use

Additional Permits/Approvals required for the Project:

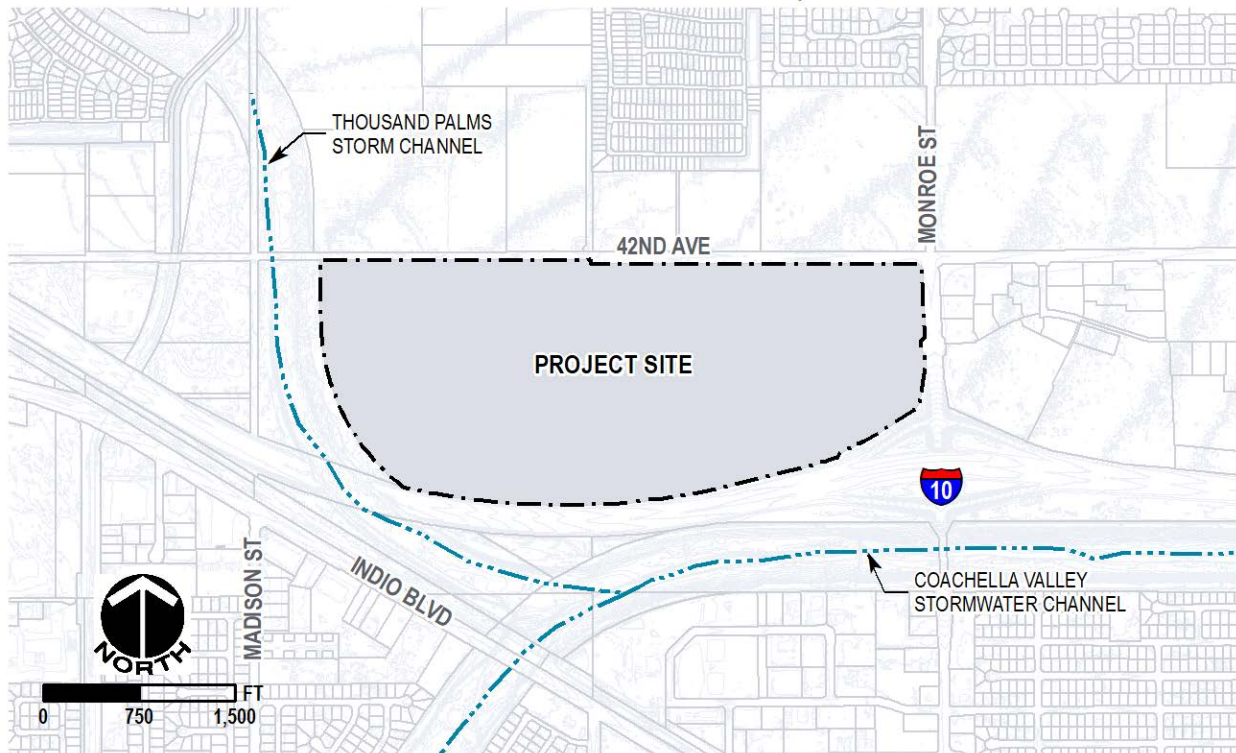
AGENCY	Permit required
State Department of Fish and Wildlife, Fish and Game Code §1602 Streambed Alteration Agreement	Y ☐ N ☒
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Certification	Y ☐ N ☒
US Army Corps of Engineers, CWA Section 404 permit	Y ☐ N ☒
US Fish and Wildlife, Endangered Species Act Section 7 biological opinion	Y ☐ N ☒
Statewide Construction General Permit Coverage	Y ☒ N ☐
Statewide Industrial General Permit Coverage	Y ☐ N ☒
Other:	
City of Indio Grading Permit	Y ☒ N ☐
City of Indio Building Permit	Y ☒ N ☐

- The proposed project activity will not divert or obstruct the natural flow or change the bed, channel, or bank of any stream, river or lake. Therefore, a State Department of Fish and Game, 1601 Streambed Alteration Agreement is not required.
- The proposed project activity will not result in discharge into navigable waters; therefore, a Clean Water Act Section 401 Water Quality Certification permit is not required.
- The proposed facility will not result in the discharge of dredged or fill materials into the waters of the United States, including wetlands. A Clean Water Act Section 404 Permit is not required for this project.
- The proposed project site is not recognized as a habitat of an endangered species nor does it form part of a Conservation Area under the Coachella Valley Multiple Species Habitat Conservation Plan. A U.S. Fish and Wildlife, Endangered Species Act Section 7 biological opinion is not required for this project.
- The proposed project is not industrial in nature. Therefore, coverage under the General Permit for Storm Water Discharges Associated with Industrial Activities is not required. This project will obtain coverage under the State Water Board NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities.

Project Introduction and Existing Conditions

The project site consists of undeveloped land located at the Southwest Corner of Avenue 42 and Monroe Street, in the City of Indio, County of Riverside, California. The Property can also be identified by Riverside County Assessor's Parcel Numbers (APNs) 610-020-001, 610-020-010, 610-020-012, 610-020-013, 610-020-021, 610-020-034, and 610-020-036. The existing site condition is visibly cleared and leveled, with a gentle prevailing slope from northwest to southeast. The leveled and cleared terrain are the result of prior agricultural uses and associated operations.

Figure 1 – Project Location



Proposed Stormwater Improvements and Management

Drainage requirements fall under the jurisdiction of the City of Indio. The City of Indio is a permittee of the Whitewater River Watershed Municipal Separate Storm Sewer System (MS4) with an existing local retention ordinance included in Title XV: Land Usage, Sec. 162.140. As a result, the project is required to provide improvements and facilities to capture and retain the storm volume resulting from the controlling 100-year storm event for the project area.

The proposed development is divided into two on-site drainage management areas (“A” and “B”) for hydrology and stormwater management purposes. Drainage Area “A” covers the northern portion of approximately 78.28 acres corresponding primarily to the mixed-uses of PA 1 and PA 2. Drainage Area “B” covers the remainder area of approximately 103.78 acres, corresponding to the industrial and mixed- uses of PA 3 and PA 4. The total hydrologic drainage area of approximately 182.06 acres differs slightly from the project boundary because it excludes the public street dedication along Avenue 42 on the north and Monroe Street on the east.

The proposed stormwater management would introduce privately constructed and maintained on-site retention facilities, surface and underground, sized to accept and infiltrate the stormwater volume resulting from the controlling 100-year storm event for the conditions of each project drainage area, as mandated by the City's Engineering Standards.

Runoff from any residential land use drainage management area will be conveyed via surface and piped flows to the respective retention basin system. The preliminary grading plan has divided the total retention capacity into smaller basins generally configured to accept flows from the nearest residential building area and associated hardscape. Each basin will have a maximum side slope of 3:1, a maximum storage depth of 4 feet, and an additional 1 foot of freeboard to comply with Engineering Standard No. 310. Conveyance into the basin will be dissipated through the required rip-rap as a method to prevent basin erosion. Each basin will have landscaping treatment to be maintained during the life of the project. Preliminarily, the combined basin retention capacity for Drainage Area A will be approximately 431,899 cubic feet. The project contemplates using underground retention facilities with a combined capacity of approximately 203,765 cubic feet to serve the residential parking areas. The combined surface and underground retention capacity of 635,664 cubic feet will be sufficient to meet the stormwater volume of 635,146 cubic feet resulting from the controlling 100-year storm event for the tributary area.

Runoff from any industrial/commercial land use drainage management areas will similarly be conveyed to the respective retention basin system. The preliminary grading plan has divided the total retention capacity into two basins configured to accept runoff from the building roof drains, hardscape and parking areas. Each basin will have a maximum side slope of 3:1, a maximum storage depth of 4 feet, and an additional 1 foot of freeboard to comply with Engineering Standard No. 310. Conveyance into the basin will be dissipated through the required rip-rap as a method to prevent basin erosion. Each basin will have landscaping treatment to be maintained during the life of the project. Preliminarily, the combined basin retention capacity for Drainage Area B will be approximately 1,160,555 cubic feet, which will be sufficient to meet the stormwater volume of 1,061,926 cubic feet resulting from the controlling 100-year storm event for the tributary area.

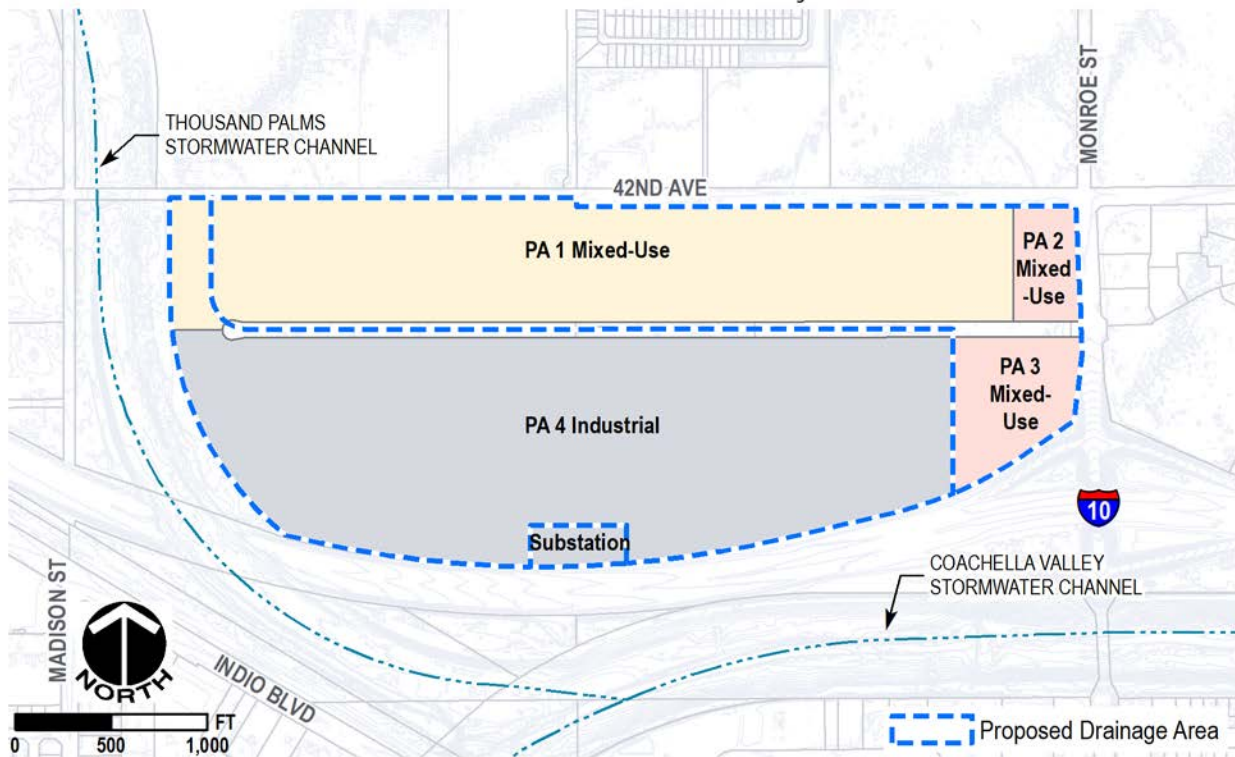
It should be noted that hydrologic calculations rely on conservative calculations that tentatively factor a completely impervious post-construction condition to generate the worst-case project runoff conditions and determine the necessary allocation of retention facilities in accordance with the City's retention requirements. The actual developed condition will include pervious landscaping that will result in smaller runoff quantities and increase the surplus in retention capacity for the project.

The specific drainage area calculations, impervious percentage, design capture volume, and provided retention capacities are provided in Table A below.

Table A – Summary of Drainage Areas and Retention Capacities

Drainage Management Area ID	On-Site Tributary Area (Acres)	Primary Land Use	Required Stormwater Retention Capacity to Manage the Controlling 100-Year Storm Event Runoff Volume	Provided Retention Capacity (Cubic Feet)	Method of Retention
DA-A	78.280 AC.	Mixed Use	635,146	635,664	Surface and Underground
DA-B	103.780 AC.	Industrial/ Mixed Use	1,061,926	1,160,555	Surface Basin
Total Hydrologic Area	182.06 AC.	See Above	1,697,072	1,796,219	See Above

Figure 2 – Drainage Management Areas



As summarized in Table A, the on-site retention facilities for each drainage area are designed to capture the Design Capture Volume for water quality purposes and sized to retain the corresponding 100-year storm event runoff volume. Therefore, they will meet the MS4 requirements by capturing runoff in accordance with the local retention requirements.

Location of Activities: Additional information to be provided in the Final WQMP.

Waste Generation: The proposed project is expected to generate non-hazardous solid waste typical of most commercial land uses. The project's waste will be collected and managed by Burrtec Waste Industries on a typical commercial schedule. All forms of non-hazardous waste will be partially mitigated by on-site maintenance, waste reduction and recycling measures, such as those established in the City's Solid Waste Ordinance.

Materials Storage and Delivery Areas: The industrial facilities are expected to have designated delivery/loading areas. Additional information about these facilities will be provided in the Final WQMP.

II. Site Characterization

Land Use Designation or Zoning:

Existing General Plan Land Use:

Mixed Use Neighborhood/Regional Commercial

Proposed General Plan Land Use:

Specific Plan

Industrial Park District

Existing Zoning:

Mixed Use Neighborhood (MUN)/Regional Commercial (RC)/Specific Plan (MU-SP)

Proposed Zoning:

Specific Plan

Current Property Use: **Vacant**

Proposed Property Use: **Specific Plan**

Availability of Soils Report: Y ☒ N ☐

Phase 1 Site Assessment: Y ☒ N ☐

Receiving Waters for Urban Runoff from Site

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use Designated Receiving Waters
Coachella Valley Stormwater Channel	DDT (Dichlorodiphenyltrichloroethane), Dieldrin, Indicator Bacteria, PCBs (Polychlorinated Biphenyls), Toxaphene, Toxicity, Nitrogen, ammonia (Total Ammonia)	FRSH, REC I <i>c</i> , REC II <i>c</i> , WARM, WILD, RARE <i>d</i>	Approximately 0.10 miles

The preceding table is based on the **2020-2022 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report**.

Abbreviations:

I – Intermittent Beneficial Use
FRSH – Freshwater Replenishment
REC I – Water Contact Recreation
REC II – Non-Contact Water Recreation
WARM – Warm Freshwater Habitat
WILD – Wildlife Habitat
RARE – Preservation of Rare, Threatened, or Endangered Species
MUN – Municipal & Domestic Supply
AGR – Agricultural Supply
GWR – Groundwater Recharge
AQUA – Aquaculture
COLD – Cold Freshwater Habitat
POW – Hydropower Generation

- a. Although it is not encouraged, children play in the water infrequently on the wildlife reserve
- b. Section of perennial flow from approximately Indio to the Salton Sea.
- c. Unauthorized use.
- d. Rare, endangered, or threatened wildlife exists in or utilizes some of this waterway.

III. Pollutants of Concern

Table 1. Pollutant of Concern Summary

Pollutant Category	Potential for Project	Causing Receiving Water Impairment
Bacteria/Virus (Pathogens)	Yes	Yes (Pathogens)
Heavy Metals	Yes	No
Nutrients	Yes	No
Toxic Organic Compounds	Yes	Yes
• Toxaphene (banned synthetic organic compound)	No	Yes
• Dieldrin (banned synthetic organic compound)	No	Yes
• Dichlorodiphenyltrichloroethane (DDT) (banned synthetic organic compound)	No	Yes
• Polychlorinated Biphenyls (PCB) (banned synthetic organic compound)	No	Yes
Sediment/Turbidity	Yes	No
Trash & Debris	Yes	No
Oil & Grease	Yes	No

The Coachella Valley Stormwater Channel is impaired by **DDT (Dichlorodiphenyltrichloroethane), Dieldrin, Indicator Bacteria, PCBs (Polychlorinated Biphenyls), Toxaphene, Toxicity, and Total Ammonia (Nitrogen, ammonia).**

- The project is not anticipated to generate DDT contamination because the use of this substance (synthetic organic compound) has been banned since 1972; therefore, it will not be handled or form part of the proposed development.
- The project is not anticipated to generate Dieldrin contamination because the use of this substance (synthetic organic compound) was related to agricultural operations (found in pesticides for crops) and it has been illegal since 1987; therefore, it will not be handled or form part of the proposed development.
- The project is not anticipated to produce polychlorinated biphenyls (PCBs) because manufacturing this substance (synthetic organic compound) stopped in 1977 and its application was banned in 1979; therefore, it will not be handled or form part of the proposed development.
- The proposed development is not anticipated to produce toxaphene because the use of this substance (synthetic organic compound) has been illegal since 1990; therefore, it will not be handled or form part of the proposed development.
- The proposed development is not anticipated to produce Nitrogen, ammonia (Total Ammonia). The source of this pollutant is unknown. Ammonia is a nutrient typically associated with commercial fertilizers utilized in agricultural operations. The project's retention facilities will contain runoff, such that it will not reach the impaired receiving waters.
- The project has the potential to generate small amounts of pathogens (bacteria/virus). These pollutants are generally associated with various human activities, but pathogens are also present in natural environments. Moreover, pathogens can be associated with wild and domesticated animal waste.

Source control measures to address this potential pollutant are discussed in the subsequent sections of this report. Runoff from the project will be conveyed to proposed retention facilities sized to capture and infiltrate the controlling 100-year storm event and the design capture volume for water quality purposes (Vbmp). Therefore, no discharge of pathogens in runoff is expected as part of the standard operating condition.

- The project is not expected to generate or discharge toxicants, such as toxic metals and synthetic organic compounds that would result in detrimental physiological responses in human, plant, animal, or indigenous aquatic life in the Coachella Valley Storm Water Channel. Due to the project's location and proposed improvements, the project will not involve direct or indirect discharges into the Coachella Valley Storm Water Channel. All project runoff will be conveyed to on-site retention facilities.

Based on Table 1 (Potential Pollutants Generated by Land Use Type) in the Riverside County Whitewater River Region Stormwater Quality Best Management Practice Design Handbook for Low Impact Development, the proposed project will consist of the following land use type and associated potential pollutants.

Type of Development (Land Use)	Sediment/ Turbidity	Nutrients	Toxic Organic Compounds	Trash & Debris	Bacteria & Viruses (Also: Pathogens)	Oil & Grease	Heavy Metals
Commercial/Industrial Development	P	P (1)	P (5)	P	P (3)	P	P (6)
Attached Residential Development	P	P	N	P	P	P(2)	N

Abbreviations:

P = Potential N = Not potential

Notes:

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected.

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected.

(3) A potential Pollutant if land use involves food or animal waste products.

(4) Specifically, petroleum hydrocarbons.

(5) Specifically, solvents; however, this Pollutant is not expected at commercial office or commercial retail sites, unless said retail is vehicle related.

(6) A potential Pollutant if the project includes outdoor storage or metal roofs; otherwise not expected.

Potential Project Pollutants: The project's land uses have the generalized potential to produce sediment/turbidity; nutrients; toxic organic compounds; trash and debris; bacteria and viruses; oil and grease; and heavy metals.

Legacy Pollutants: There is no evidence of legacy pollutants on-site.

Pollutants of Concern: Based on the comparison of potential project pollutants with the pollutant categories causing receiving water impairments, the pollutants of concern include **bacteria/virus**. The project's proposed storm drain improvements are designed to intercept and retain the flood volume resulting from the 100-year storm event. Therefore, the project will not produce pollutants that could affect off-site or downstream resources, such as the proximate receiving waters.

IV. Hydrologic Conditions of Concern

Local Jurisdiction Requires On-Site Retention of Urban Runoff:

- Yes ☒ The project will be required to retain urban runoff onsite in conformance with local ordinance (See Table 6 of the WQMP Guidance document, "Local Land use Authorities Requiring Onsite Retention of Stormwater"). This section does not need to be completed; however, retention facility design details and sizing calculations must be included in Appendix F.

Note: MS4 and local retention ordinance requirements will be satisfied by conveying the project's required runoff volume into properly sized on-site retention facilities for reach drainage area. As a result, the project will not result in changes to the hydrologic regime that will permanently impact downstream channels, receiving waters, or habitat integrity. No Hydrologic Conditions of Concern are expected to result from the project.

- No ☐ This section must be completed.

This Project meets the following condition:

- ☐ **Condition A:** 1) Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4 or engineered and maintained channel, 2) the discharge is in full compliance with local land use authority requirements for connections and discharges to the MS4 (including both quality and quantity requirements), 3) the discharge would not significantly impact stream habitat in proximate Receiving Waters, **and** 4) the discharge is authorized by the local land use authority.
- ☐ **Condition B:** The project disturbs less than 1 acre and is not part of a larger common plan of development that exceeds 1 acre of disturbance. The disturbed area calculation must include all disturbances associated with larger plans of development.
- ☐ **Condition C:** The project's runoff flow rate, volume, velocity and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year 24-hour rainfall events. This condition can be achieved by, where applicable, complying with the local land use authority's on-site retention ordinance, or minimizing impervious area on a site and incorporating other Site-Design BMP concepts and LID/Site Design BMPs that assure non-exceedance of pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the local land use authority.
- ☐ **None:** Refer to Section 3.4 of the Whitewater River Region WQMP Guidance document for additional requirements.

Supporting engineering studies, calculations, and reports are included in Appendix C.

V. Best Management Practices

This project implements Best Management Practices (BMPs) to address the Pollutants of Concern that may potentially be generated from the use of the project site. These BMPs have been selected and implemented to comply with Section 3.5 of the WQMP Guidance document, and consist of Site Design BMP concepts, Source Control, LID/Site Design and, if/where necessary, Treatment Control BMPs as described herein.

V.1 SITE DESIGN BMP CONCEPTS, LID/SITE DESIGN AND TREATMENT CONTROL BMPs

Local Jurisdiction Requires On-Site Retention of Urban Runoff:

Yes ☒ The project will be required to retain Urban Runoff onsite in conformance with local ordinance (See Table 6 of the WQMP Guidance document, "Local Land use Authorities Requiring Onsite Retention of Stormwater). **The LID/Site Design measurable goal has thus been met (100%), and Sections V.1.A and V.1.B do not need to be completed;** however, retention facility design details and sizing calculations must be included in Appendix F, and '100%' should be entered into Column 3 of Table 6 below.

Note: MS4 and local retention ordinance requirements will be satisfied by conveying the project's required runoff volume into properly sized on-site retention facilities for reach drainage area. As a result, the project will not result in changes to the hydrologic regime that will permanently impact downstream channels, receiving waters, or habitat integrity. No Hydrologic Conditions of Concern are expected to result from the project.

No ☐ Section V.1 must be completed.

This section of the Project-Specific WQMP documents the LID/Site Design BMPs and, if/where necessary, the Treatment Control BMPs that will be implemented on the project to meet the requirements detailed within Section 3.5.1 of the WQMP Guidance document. Section 3.5.1 includes requirements to implement Site Design Concepts and BMPs, and includes requirements to address Pollutants of Concern with BMPs. Further, sub-section 3.5.1.1 specifically requires that Pollutants of Concern be addressed with LID/Site Design BMPs to the extent feasible.

LID/Site Design BMPs are those BMPs listed within Table 2 below which promote retention and/or feature a natural treatment mechanism; off-site and regionally-based BMPs are also LID/Site Design BMPs, and therefore count towards the measurable goal, if they fit these criteria. This project incorporates LID/Site Design BMPs to fully address the Treatment Control BMP requirement where and to the extent feasible. If and where it has been acceptably demonstrated to the local land use authority that it is infeasible to fully meet this requirement with LID/Site Design BMPs, Section V.1.B (below) includes a description of the conventional Treatment Control BMPs that will be substituted to meet the same requirements.

In addressing Pollutants of Concern, BMPs are selected using Table 2 below.

Table 2. BMP Selection Matrix Based Upon Pollutant of Concern Removal Efficiency ⁽¹⁾

(Sources: Riverside County Flood Control & Water Conservation District Design Handbook for Low Impact Development Best Management Practices, dated September 2011, the Orange County Technical Guidance Document for Water Quality Management Plans, dated May 19, 2011, and the Caltrans Treatment BMP Technology Report, dated April 2010 and April 2008)

Pollutant of Concern	Landscape Swale ^{2,3}	Landscape Strip ^{2,3}	Biofiltration (with underdrain) ^{2,3}	Extended Detention Basin ²	Sand Filter Basin ²	Infiltration Basin ²	Infiltration Trench ²	Permeable Pavement ²	Bioretention (w/o underdrain) ^{2,3}	Other BMPs Including Proprietary BMPs ^{4,6}
Sediment & Turbidity	M	M	H	M	H	H	H	H	H	Varies by Product ⁵
Nutrients	L/M	L/M	M	L/M	L/M	H	H	H	H	
Toxic Organic Compounds (Specifically, Hydrocarbons)	M/H	M/H	M/H	L	L/M	H	H	H	H	
Trash & Debris	L	L	H	H	H	H	H	L	H	
Bacteria & Viruses (also: Pathogens)	L	M	H	L	M	H	H	H	H	
Oil & Grease	M	M	H	M	H	H	H	H	H	
Heavy Metals	M	M/H	M/H	L/M	M	H	H	H	H	
Abbreviations: L: Low removal efficiency M: Medium removal efficiency H: High removal efficiency										
Notes: (1) Periodic performance assessment and updating of the guidance provided by this table may be necessary. (2) Expected performance when designed in accordance with the most current edition of the document, "Riverside County, Whitewater River Region Stormwater Quality Best Management Practice Design Handbook". (3) Performance dependent upon design which includes implementation of thick vegetative cover. Local water conservation and/or landscaping requirements should be considered; approval is based on the discretion of the local land use authority. (4) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP (including proprietary filters, hydrodynamic separators, inserts, etc.), or newly developed/emerging stormwater treatment technologies. (5) Expected performance should be based on evaluation of unit processes provided by BMP and available testing data. Approval is based on the discretion of the local land use authority. (6) When used for primary treatment as opposed to pre-treatment, requires site-specific approval by the local land use authority.										

V.1.A SITE DESIGN BMP CONCEPTS AND LID/SITE DESIGN BMPs

Note: This section is not applicable Due to conformance with local retention ordinance per Section 3.5.1.2 of Whitewater River Region WQMP Guidance Document.

This section documents the Site Design BMP concepts and LID/Site Design BMPs that will be implemented on this project to comply with the requirements detailed in Section 3.5.1 of the WQMP Guidance document.

- Table 3 herein documents the implementation of the Site Design BMP Concepts described in sub-sections 3.5.1.3 and 3.5.1.4.
 - Table 4 herein documents the extent to which this project has implemented the LID/Site Design goals described in sub-section 3.5.1.1.
-
-

Table 3. Implementation of Site Design BMP Concepts

Design Concept	Technique	Specific BMP	Included			Brief Reason for BMPs Indicated as No or N/A
			Yes	No	N/A	
Site Design BMP Concept 1	Minimize Urban Runoff, Minimize Impervious Footprint, and Conserve Natural Areas (See WQMP Section 3.5.1.3)	Conserve natural areas by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition.	☐	☐	☒	The entire project site has previously been disturbed and will be utilized for the project. There are no environmentally sensitive areas.
		Conserve natural areas by incorporating the goals of the Multi-Species Habitat Conservation Plan or other natural resource plans.	☐	☐	☒	The project is not located within the Coachella Valley MSCHP conservation area.
		Preserve natural drainage features and natural depressional storage areas on the site.	☐	☐	☒	The project does not have natural drainage features or natural depressional areas that may be preserved.
		Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	☒	☐	☐	The site does not have existing vegetation coverage. The proposed plans will use drought tolerant plants.
		Use natural drainage systems.	☐	☐	☒	The site does not contain natural drainage courses.
		Where applicable, incorporate Self-Treating Areas	☐	☐	☒	The site does not contain self-treating areas.
		Where applicable, incorporate Self-Retaining Areas	☐	☐	☒	The project relies on underground retention facilities instead of retention areas.
		Increase the building floor to area ratio (i.e., number of stories above or below ground).	☒	☐	☐	The lot coverage is consistent with the approved PMP.
		Construct streets, sidewalks and parking lot aisles to minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.	☒	☐	☐	Widths of streets and drive aisles are designed per City standards.
		Reduce widths of streets where off-street parking is available.	☒	☐	☐	The width of proposed interior drive aisles will be designed according to the City standards.
		Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.	☒	☐	☐	Landscaping improvements are proposed to reduce impervious surfaces.
		Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☐	☐	☒	No other Site Design BMP concepts are proposed.

Table 3. Site Design BMP Concepts (continued)

Design Concept	Technique	Specific BMP	Included			Brief Reason for Each BMP Indicated as No or N/A
			Yes	No	N/A	
Site Design BMP Concept 2	Minimize Directly Connected Impervious Area (See WQMP Section 3.5.1.4)	Design residential and commercial sites to contain and infiltrate roof runoff, or direct roof runoff to landscaped swales or buffer areas.	☐	☐	☒	The project has limited landscaped areas.
		Drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.	☐	☐	☒	The project has limited landscaped areas.
		Incorporate landscaped buffer areas between sidewalks and streets.	☒	☐	☐	Landscaped areas will provide pervious cover.
		Use natural or landscaped drainage swales in lieu of underground piping or imperviously lined swales.	☐	☒	☐	Storm runoff conveyance will primarily occur via imperviously lined surface flows.
		Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.	☐	☒	☐	Not proposed with the site or storm drain design.
		Maximize the permeable area by constructing walkways, trails, patios, overflow parking, alleys, driveways, low-traffic streets, and other low-traffic areas with open-jointed paving materials or permeable surfaces such as pervious concrete, porous asphalt, unit pavers, and granular materials.	☐	☒	☐	As designed, there are currently no proposed open-jointed paving materials or other permeable surfaces (except for landscaped areas) that would help maximize permeable areas.
		Use one or more of the following:				
		Rural swale system: street sheet flows to landscaped swale or gravel shoulder, curbs used at street corners, and culverts used under driveways and street crossings.	☐	☒	☐	A rural swale system is not proposed. Runoff from the project will be retained on-site in retention facilities.
		Urban curb/swale system: street slopes to curb; periodic swale inlets drain to landscaped swale or biofilter.	☐	☒	☐	An urban curb/swale system is not proposed. Runoff from the project will be retained on-site in retention facilities.
		Dual drainage system: first flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder; high flows connect directly to MS4s.	☐	☒	☐	Runoff from the project will be retained on-site.
		Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☒	☐	☐	The project includes retention facilities sized according to the local requirements.
		Use one or more of the following for design of driveways and private residential parking areas:				
		Design driveways with shared access, flared (single lane at street), or wheel strips (paving only under the tires).	☐	☒	☐	The proposed drive aisles are designed in accordance with the local development standards. The use of single lanes or wheel strips is not feasible for this project.

Design Concept	Technique	Specific BMP	Included			Brief Reason for Each BMP Indicated as No or N/A
			Yes	No	N/A	
		Uncovered temporary or guest parking on residential lots paved with a permeable surface, or designed to drain into landscaping.	☐	☐	☒	Not proposed.
Site Design BMP Concept 2 (cont'd)	Minimize Directly Connected Impervious Area (See WQMP Section 3.5.1.4)	Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☐	☐	☒	Not provided.
		Use one or more of the following for design of parking areas:				
		Where landscaping is proposed in parking areas, incorporate parking area landscaping into the drainage design.	☒	☐	☐	
		Overflow parking (parking stalls provided in excess of the Permittee's minimum parking requirements) may be constructed with permeable pavement.	☐	☒	☐	Permeable pavement is not proposed.
		Other comparable and equally effective Site Design BMP (or BMPs) as approved by the local land use authority (Note: Additional narrative required describing BMP and how it addresses site design concept).	☐	☒	☐	No additional comparable or equally effective BMPs are proposed under Site Design Concept 2. Landscaping improvements are proposed to help minimize directly connected impervious areas.

Project Site Design BMP Concepts:

Note: This section is not applicable Due to conformance with local retention ordinance per Section 3.5.1.2 of Whitewater River Region WQMP Guidance Document.

Alternative Project Site Design BMP Concepts:

Not Applicable

Table 4. LID/Site Design BMPs Meeting the LID/Site Design Measurable Goal

(1) DRAINAGE SUB-AREA ID OR NO.	(2) LID/SITE DESIGN BMP TYPE* (See Table 2)	(3) POTENTIAL POLLUTANTS OF CONCERN WITHIN DRAINAGE SUB- AREA (Refer to Table 1)	(4) POTENTIAL POLLUTANTS WITHIN SUB-AREA CAUSING RECEIVING WATER IMPAIRMENTS (Refer to Table 1)	(5) EFFECTIVENESS OF LID/SITE DESIGN BMP AT ADDRESSING IDENTIFIED POTENTIAL POLLUTANTS (U, L, M, H/M, H; see Table 2)	(6) BMP MEETS WHICH DESIGN CRITERIA? (Identify as V _{BMP} OR Q _{BMP})	(7) TOTAL AREA WITHIN DRAINAGE SUB-AREA (Nearest 0.1 acre)
DA-A	Infiltration	Bacteria/virus	Bacteria/virus	H (High Effectiveness)	V _{BMP} 635,664 CF of Storage Provided	78.280 AC.
DA-B	Infiltration	Bacteria/virus	Bacteria/virus	H (High Effectiveness)	V _{BMP} 1,160,555 CF of Storage Provided	103.780 AC.
TOTAL PROJECT AREA TREATED WITH LID/SITE DESIGN BMPs (NEAREST 0.1 ACRE)						182.06 AC.

* LID/Site Design BMPs listed in this table are those that completely address the 'Treatment Control BMP requirement' for their drainage sub-area.

Note: Local retention ordinance requirements will be satisfied by conveying the project's design capture runoff volume and controlling 100-year storm event volume into on-site retention facilities.

Justification of infeasibility for sub-areas not addressed with LID/Site Design BMPs

Insert text here listing each drainage sub-area wherein the design criteria of VBMP and/or QBMP are not treated using LID/Site Design BMPs as required in WQMP Guidance Section 3.5.1.1, and provide justification of infeasibility for each.

V.1.B TREATMENT CONTROL BMPs

Conventional Treatment Control BMPs shall be implemented to address the project's Pollutants of Concern as required in WQMP Section 3.5.1 where, and to the extent that, Section V.1.A has demonstrated that it is infeasible to meet these requirements through implementation of LID/Site Design BMPs.

- ☒ The LID/Site Design BMPs described in Section V.1.A of this project-specific WQMP completely address the 'Treatment Control BMP requirement' for the entire project site (and where applicable, entire existing site) as required in Section 3.5.1.1 of the WQMP Guidance document. Supporting documentation for the sizing of these LID/Site Design BMPs is included in Appendix F. ***Section V.1.B does not need to be completed.**
- ☐ The LID/Site Design BMPs described in Section V.1.A of this project-specific WQMP do **NOT** completely address the 'Treatment Control BMP requirement' for the entire project site (or where applicable, entire existing site) as required in Section 3.5.1.1 of the WQMP. ***Section V.1.B must be completed.**
-

The Treatment Control BMPs identified in this section are selected, sized and implemented to treat the design criteria of V_{BMP} and/or Q_{BMP} for all project (and if required, existing site) drainage sub-areas which were not fully addressed using LID/Site Design BMPs. Supporting documentation for the sizing of these Treatment Control BMPs is included in Appendix F.

Table 5: Treatment Control BMP Summary

(1) DRAINAGE SUB-AREA ID OR NO.	(2) TREATMENT CONTROL BMP TYPE*	(3) POTENTIAL POLLUTANTS OF CONCERN WITHIN DRAINAGE SUB-AREA	(4) POTENTIAL POLLUTANTS WITHIN SUB-AREA CAUSING RECEIVING WATER IMPAIRMENTS	(5) EFFECTIVENESS OF TREATMENT CONTROL BMP AT ADDRESSING IDENTIFIED POTENTIAL POLLUTANTS	(6) BMP MEETS WHICH DESIGN CRITERIA?	(7) TOTAL AREA WITHIN DRAINAGE SUB-AREA
	(See Table 2)	(Refer to Table 1)	(Refer to Table 1)	(U, L, M, H/M, H; see Table 2)	(Identify as V _{BMP} OR Q _{BMP})	(Nearest 0.1 acre)
						N/A
	TOTAL PROJECT AREA TREATED WITH TREATMENT CONTROL BMPs (NEAREST 0.1 ACRE)					N/A

Note: Local retention ordinance requirements will be satisfied by conveying the project's design capture runoff volume and controlling 100-year storm event volume into on-site retention facilities.

V.1.C MEASURABLE GOAL SUMMARY

This section documents the extent to which this project has met the measurable goal described in WQMP Section 3.5.1.1 of addressing 100% of the project's 'Treatment Control BMP requirement' with LID/Site Design BMPs. Projects required to retain Urban Runoff onsite in conformance with local ordinance are considered to have met the measurable goal; for these instances, '100%' is entered into Column 3 of the Table.

Table 6: Measurable Goal Summary

(1) Total Area Treated with <u>LID/Site Design</u> BMPs (Last row of Table 4)	(2) Total Area Treated with <u>Treatment Control</u> BMPs (Last row of Table 5)	(3) % of Treatment Control BMP Requirement addressed with LID/Site Design BMPs
182.06 AC <i>Infiltration Facility BMP will allow conformance with the local retention ordinance.</i>	N/A <i>Due to conformance with local retention ordinance per Section 3.5.1.2 of Whitewater River Region WQMP Guidance Document.</i>	100 <i>Based on conformance with local retention ordinance per Section 3.5.1.2 of Whitewater River Region WQMP Guidance Document.</i>

V.2 SOURCE CONTROL BMPs

This section identifies and describes the Source Control BMPs applicable and implemented on this project.

Table 7. Source Control BMPs

BMP Name	Check One		If not applicable, state brief reason
	Included	Not Applicable	
Non-Structural Source Control BMPs			
Education for Property Owners, Operators, Tenants, Occupants, or Employees	☒	☐	
Activity Restrictions	☒	☐	
Irrigation System and Landscape Maintenance	☒	☐	
Common Area Litter Control	☒	☐	
Street Sweeping Private Streets and Parking Lots	☒	☐	
Drainage Facility Inspection and Maintenance	☒	☐	
Structural Source Control BMPs			
Storm Drain Inlet Stenciling and Signage	☒	☐	
Landscape and Irrigation System Design	☒	☐	
Protect Slopes and Channels	☐	☒	Not applicable.
Provide Community Car Wash Racks	☐	☒	Not applicable.
Properly Design*:			
Fueling Areas	☐	☒	Not applicable.
Air/Water Supply Area Drainage	☐	☒	Not applicable.
Trash Storage Areas	☐	☒	Not applicable.
Loading Docks	☒	☐	
Maintenance Bays	☐	☒	Not applicable.
Vehicle and Equipment Wash Areas	☐	☒	Not applicable.
Outdoor Material Storage Areas	☐	☒	Not applicable.
Outdoor Work Areas or Processing Areas	☐	☒	Not applicable.
Provide Wash Water Controls for Food Preparation Areas	☐	☒	Not applicable.

*Details demonstrating proper design must be included in Appendix F.

Non-Structural Source Control BMPs

Education Program: (Property management/operator)

Maintenance staff should be informed on topics related to stormwater pollution and prevention through various means, which can include the distribution of printed materials or public posting of rules or activity restrictions. Staff may also be referred to the education materials in Appendix D of this WQMP or to the Riverside County Watershed Protection web site at the following link:

<https://www.rcwatershed.org/>

Activity Restrictions: (Property management/operator)

Activity restrictions may prohibit littering, dumping of waste or non-stormwater discharge into storm drain system, hosing of debris or non-stormwater materials into storm drain system, or causing nuisance non-stormwater flows into storm drain system. Improper handling of categorized hazardous materials is often prohibited under federal law.

Irrigation System and Landscape Maintenance: (Property management/operator)

The irrigation and landscape maintenance will help increase the effectiveness of these systems and minimize the amount of runoff that enters the storm drain system. Erosion and the conveyance of pesticides/fertilizers in runoff should also be prevented through proper routine maintenance. Routine irrigation system and landscape maintenance will also serve as a vector control measure due to the minimization of nuisance water runoff and stagnation.

Common Area Litter Control: (Property management/operator)

Common area litter control should be implemented to reduce pollution in runoff. Routine monitoring should be performed in the landscaped areas, trash receptacles, in common areas, and along the project edges. Any observed accumulated trash, vegetation debris or improper disposal should be addressed promptly by the designated staff. Common area litter control measures can be coordinated and improved by the landscaping maintenance is currently taking place on-site. No trash should be allowed to be stored at the base of the containers. Pick-up intervals should be determined so that the containers are not overfilled.

Paved Area Sweeping and Cleaning: (Property management/operator)

Paved area sweeping and/or cleaning is recommended on-site to prevent sediment, litter and other debris from being washed by runoff into the on-site storm drain system and retention facilities. Paved area sweeping should be performed during dry weather if possible and the frequency should be flexible to accommodate climate conditions and areas of concern. All collected debris should be transported to an appropriate disposal facility.

Structural Source Control BMPs

The project will incorporate measures to discourage illegal dumping in the proposed private storm drain system.

MS4 Stenciling: (Property management/operator)

At each storm drain inlet, a stencil or fixed sign (including medallions) should contain a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. The legibility of markers and signs should be maintained throughout the life of the project.

Rules and Regulations: (Property management/operator)

The facility management should establish and implement rules that prohibit improper non-stormwater discharge into the storm drain system. This measure may also be considered non-structural and form part of the activity restrictions associated with the site's standard operating procedures.

Landscape and Irrigation System Design: (Property management/operator)

The site's structural source control BMP involves an efficient landscape irrigation design consistent with the local ordinances. The system will include native or drought-tolerant plants and mechanisms to minimize excess irrigation and nuisance water into the stormwater conveyance system while working to reduce soil amendments and irrigation frequency. The system should also minimize the conveyance of landscape related chemicals, including pesticides.

Trash Receptacles in Common Areas: (Property management/operator)

Trash containers shall be leak proof and have attached covers or lids.

Storm Drain System Facilities: (Property management/operator)

Catch basins and storm drainage facilities on-site should be inspected, cleaned, and maintained routinely. Maintenance staff should take prompt action to correct or repair malfunctioning facilities.

Building and Grounds Maintenance (CASQA SC-41): (Property management/operator)

A series of maintenance practices can be implemented to prevent or reduce the discharge of potential pollutants into the storm drain system resulting from building and grounds maintenance activities. The BMP implementation will be achieved with the following guidelines under SC-41: washing and cleaning up with as little water as possible; following good landscape management practices; preventing and cleaning up spills immediately; keeping debris from entering the storm drains; and properly maintaining the stormwater collection system.

Note about Wash Water Controls for Food Preparation Areas: Not Applicable

V.3 EQUIVALENT TREATMENT CONTROL BMP ALTERNATIVES

Not applicable.

V.4 REGIONALLY-BASED BMPs

Not applicable.

VI. Operation and Maintenance Responsibility for BMPs

The operation and maintenance responsibilities recommended herein, including responsible parties, are for reference purposes only and are not intended to supersede the standard operating procedures imposed by the City.

TABLE 8 - OPERATIONS AND MAINTENANCE

BMP Requiring Maintenance	Party Responsibility	Recommended Inspection and Maintenance Frequency	Recommended Self-Inspection and Record Keeping	Implementation Period	Recommended O & M Activities and Process
Landscaped Areas	Property Owner or Operator	At least twice monthly or according to a maintenance schedule.	Quarterly summaries of inspection and maintenance activities should be appended to the WQMP.	Post-Construction	(See following page)
Irrigation System	Property Owner or Operator	At least twice monthly or according to a maintenance schedule.		Post-Construction	(See following page)
Trash Receptacles and Common Area Litter Control	Property Owner or Operator	Based on trash pick-up intervals and according to a maintenance schedule.		Post-Construction	(See following page)
Paved Area Sweeping	Property Owner or Operator	Twice monthly or according to a maintenance schedule		Post-Construction	(See following page)
Storm Drain System	Property Owner or Operator	Quarterly and after storm events or according to a maintenance schedule		Post-Construction	(See following page)
Surface Retention	Property Owner or Operator	Quarterly and after storm events or according to a maintenance schedule		Post-Construction	(See following page)
Potential Underground Retention	Property Owner or Operator	Quarterly and after storm events or according to an established maintenance schedule		Post-Construction	(See following page)

*Note: "Storm events" refer to precipitation events producing 0.5 inches of rain or greater within a 48-hour period. The occurrence of these events may be confirmed against the local rain event summaries published in the National Weather Service or National Oceanic and Atmospheric Administration web site (www.noaa.gov). The recommended inspection, maintenance, and recordkeeping practices in this WQMP may be addressed by a formal schedule, operations manual, and other standard operating procedures which may be developed for this site.

Note: The following maintenance recommendations, including the responsible parties, inspection intervals, and maintenance intervals, are not intended to be exhaustive in nature and should not serve as the sole source of on-site operating procedures.

Description of Maintenance Requirements:

Landscaped Areas: All trimming, pruning, and removal of fallen organic material from plants, shrubs, and trees should be collected per an established landscape maintenance plan for proper disposal in green waste collection facilities. Mechanical equipment or associated materials temporarily staged during maintenance activities should be placed away from storm water drainage facilities, including inlets and conveyances. Where applicable, collected waste resulting from the maintenance activities should be promptly transported to the designated disposal containers or locations. In conjunction with the routine activities, maintenance staff should visually inspect for indicators of improper watering levels so that adequate adjustments can be made.

Irrigation Systems: Water conservation practices should be upheld at all times per the approved irrigation plans and established practices. Monitoring of the irrigation system should be performed as necessary to ensure that appropriate watering levels are maintained and to verify that no piping or irrigation heads are leaking. Any debris, sediment, mineral and grit deposits should be removed from the irrigation system at regular intervals to provide consistent watering levels. The irrigation and landscape maintenance will help increase the effectiveness of these systems and minimize the amount of runoff that enters the storm drain system. Erosion and the conveyance of pesticides/fertilizers in runoff will also be reduced through routine maintenance.

Trash Management and Common Area Litter Control: Common area litter control should be implemented to reduce pollution in runoff. Routine monitoring should be performed in the landscaped areas, trash receptacles, in common areas, and along the project edges. Any observed accumulated trash, vegetation debris or improper disposal should be addressed promptly by the designated staff. Common area litter control measures can be coordinated and improved by the landscaping maintenance is currently taking place on-site. No trash should be allowed to be stored at the base of the containers. Pick-up intervals should be determined so that the containers are not overfilled. Any form of hazardous waste or petroleum products should be properly handled according to the applicable industry standards and regulations.

Storm Drain System: Storm water conveyance systems, including inlets, swales, outlets, cleanouts, manholes and pipelines within the project should be inspected quarterly and after each major storm event or according to a maintenance schedule. All parts of the system should be periodically cleaned to ensure that the system works properly during any storm event. Any waste collected from the cleaning activities should be collected and handled for proper disposal.

Paved Area Sweeping and Cleaning

Paved area sweeping is recommended to prevent sediment, litter and other debris from being washed by runoff into the on-site storm drain system. Paved area sweeping should be performed during dry weather if possible and the frequency should be flexible to accommodate climate conditions and areas of concern. Street sweeping equipment must be operated only by trained personnel based on the manufacturer's specifications. Street sweeping equipment should be properly maintained off-site by the operator. Debris should be collected for proper handling and disposal.

Retention Basins: Retention basins shall be visually inspected on a quarterly basis or according to a landscaping maintenance schedule. Physical obstructions caused by vegetation debris or littering shall be

promptly cleared by the designated personnel to ensure that the basins continue to function as designed. Any material collected (e.g. landscape debris or trash) shall be properly handled and disposed of. Basin outlets must be inspected for signs of erosion or obstruction and cleaned/repared as needed.

Before annual storm seasons and following rainfall events producing precipitation of 0.5 inches or more:

- Maintain landscaping and irrigation system as needed.
- Remove debris and litter from the entire basin to minimize clogging and improve aesthetics.
- Inspect for obvious problems and repair as needed. Address odor, insects, and overgrowth issues associated with stagnant or standing water in the basin bottom. No standing water should be present longer than 72 hours.
- Check for erosion and sediment laden areas in the basin. Repair as needed.
- Re-stabilize the basin slopes as needed.

Perform the following inspection procedures within 72 hours after a rainfall event producing precipitation of 0.5 inches or greater:

- Examine the tributary inlet for blockage, the embankment and spillway integrity, as well as damage to any structural element.
- Check for erosion, slumping and overgrowth. Repair as needed.
- Check basin depth for sediment build up and reduced total capacity. Scrape bottom as needed and remove sediment. Restore to original cross-section and infiltration rate. Replant basin vegetation.
- No water should be present 72 hours after a rainfall event. No long-term standing water should be present at all. No algae formation should be visible.

Underground Retention System:

*Per the system manufacturer, the underground stormwater detention/infiltration must be properly inspected and maintained at regular intervals for purpose of performance and longevity. **Refer to the manufacturer for additional or updated information regarding inspection and maintenance.***

Inspection

Inspection is the key to effective maintenance and is easily performed. Contech recommends ongoing quarterly inspections. The rate at which the system collects pollutants will depend more heavily on site specific activities rather than the size or configuration of the system. Inspections shall be performed more often in instances in which higher accumulations of sediment or abrasive / corrosive conditions may exist. Inspection and maintenance records shall be maintained for the life of the system.

Maintenance

Systems shall be cleaned when inspection reveals that accumulated sediment or trash is clogging the discharge orifice. Accumulated sediment and trash can typically be evacuated through the manhole over the outlet orifice. If maintenance is not performed as recommended, sediment and trash may accumulate in front of the outlet orifice. Manhole covers shall be securely seated following cleaning activities. Contech suggests that all systems be designed with an access/inspection manhole situated at or near the inlet and the outlet orifice. Shall it be necessary to get inside the system to perform maintenance activities, all appropriate precautions regarding confined space entry and OSHA regulations shall be followed.

Maintaining an underground detention or retention system is easiest when there is no flow entering the system. For this reason, it is a good idea to schedule the cleanout during dry weather.

The foregoing inspection and maintenance efforts help ensure underground pipe systems used for stormwater storage continue to function as intended by identifying recommended regular inspection and maintenance practices. Inspection and maintenance related to the structural integrity of the pipe or the soundness of pipe joint connections is beyond the scope of this guide.

Record Keeping: A copy of this project-specific WQMP should be maintained on-site or remotely by the project owner or operator (Home Owner's Association). Records of maintenance shall be appended to this WQMP.

Funding

The funding source for operation and maintenance of each BMP identified in the Project Specific Final Water Quality Management Plan shall be the responsibility of the current project owner, **Commercial Lighting Industries, Inc.** The owner recognizes that a source of funding is required to support the on-going operation and maintenance of BMPs, and that funding will continue for the life of the project.

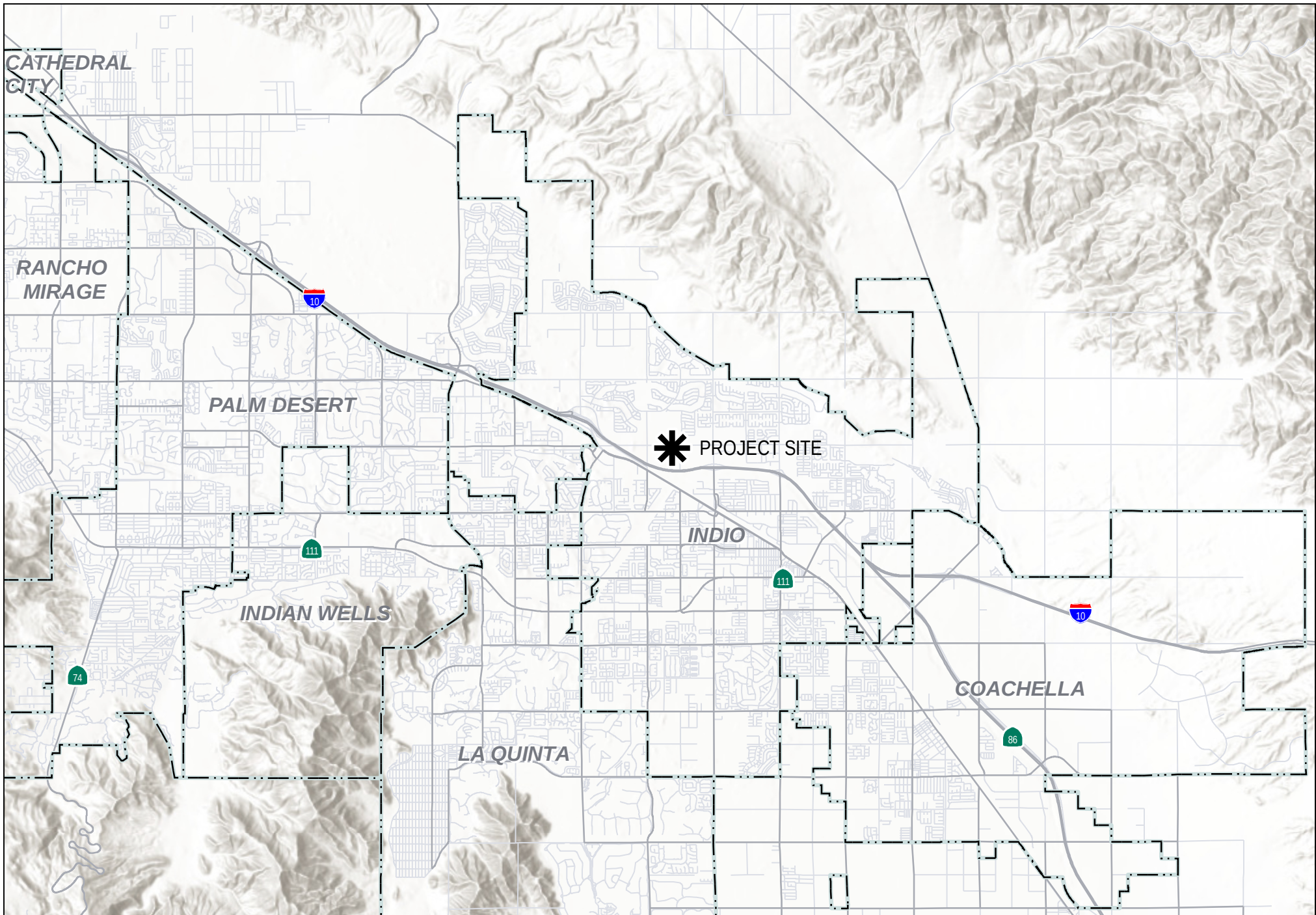
By certifying the final project specific WQMP, the Project applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners. One example of how to adhere to the requirement to transfer operation and maintenance responsibilities is to record the project specific WQMP against the title to the property.

Appendix A

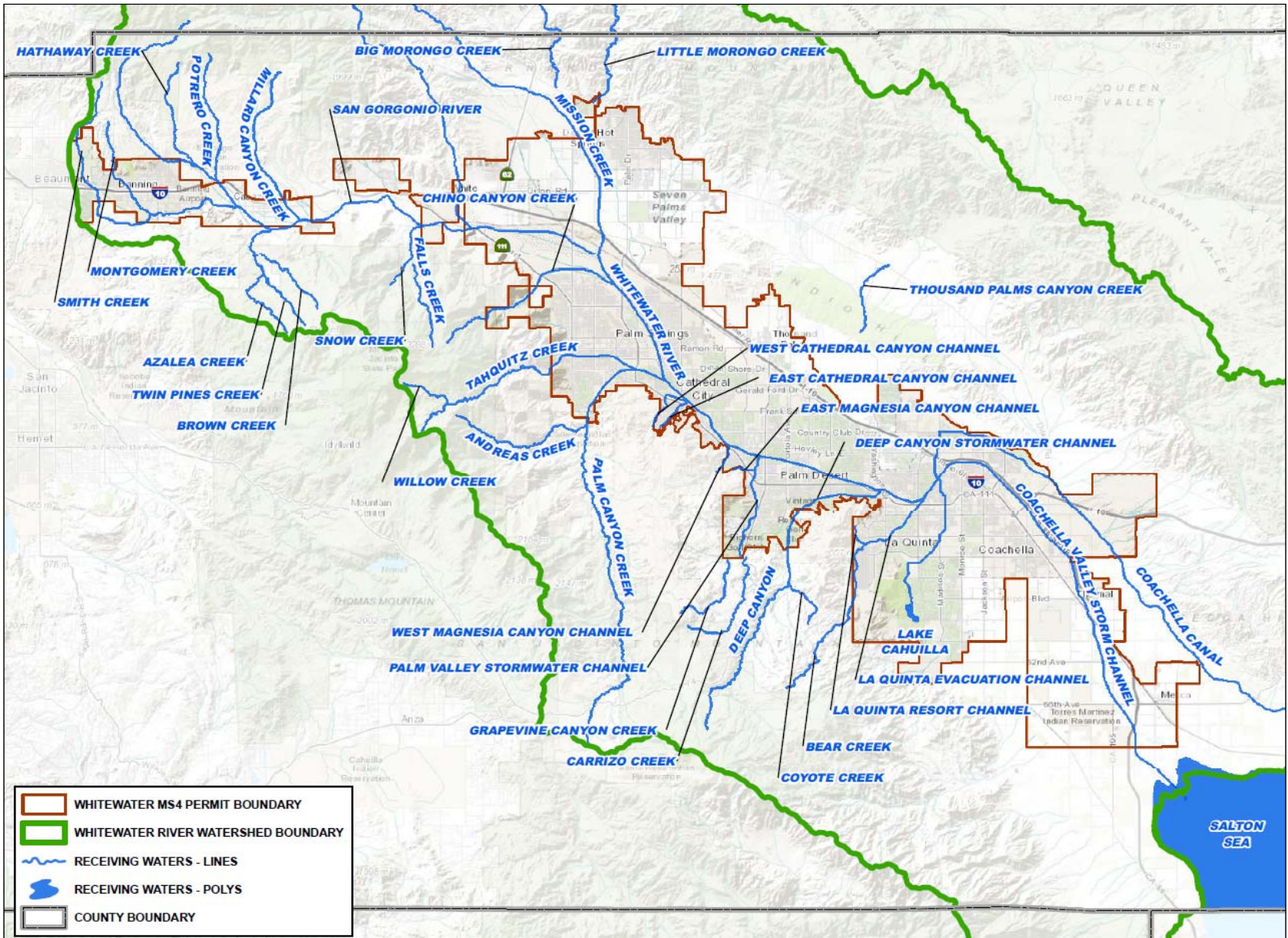
Conditions of Approval

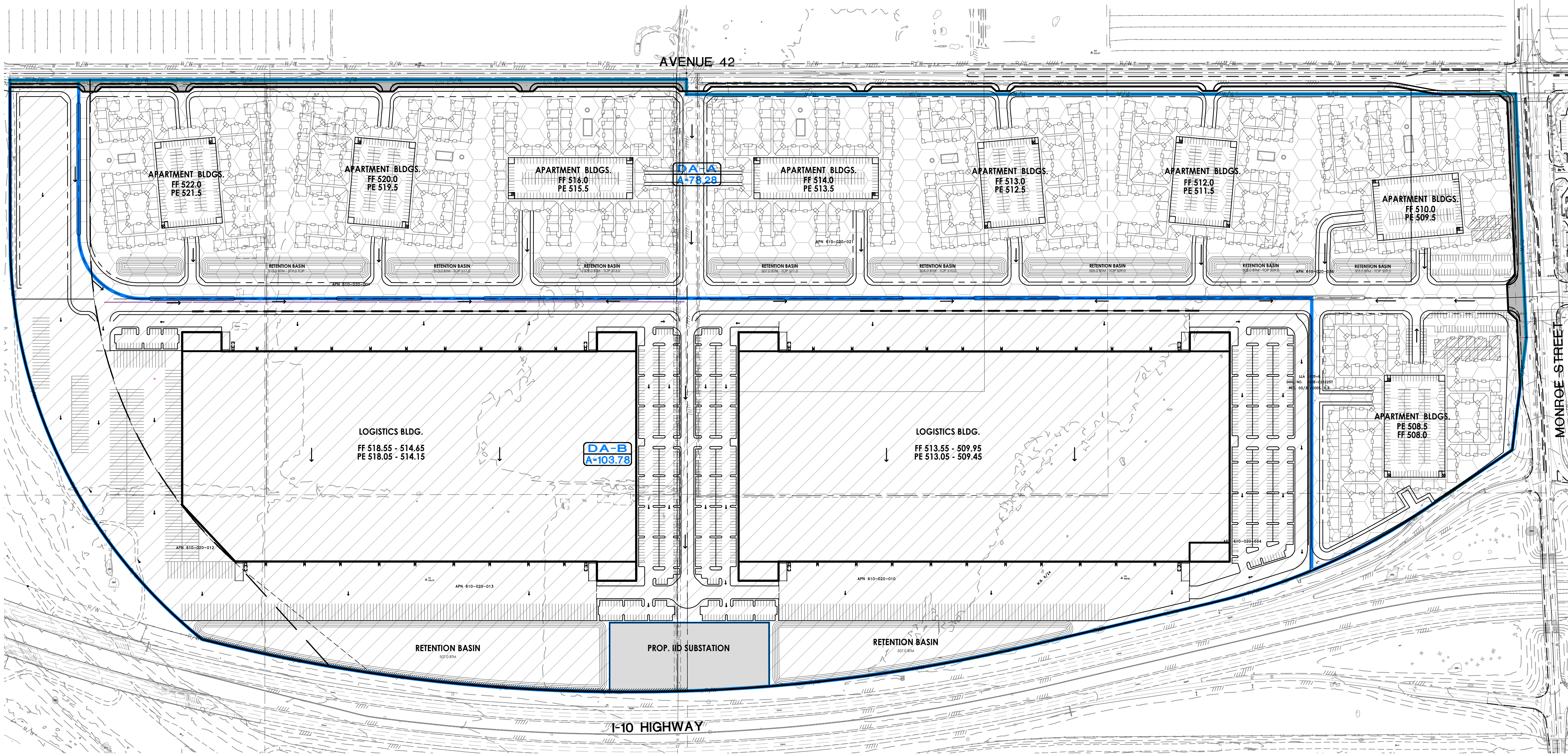
Appendix B

Vicinity Map, WQMP Site Plan, and Receiving Waters Map



Whitewater River Region Receiving Waters Map





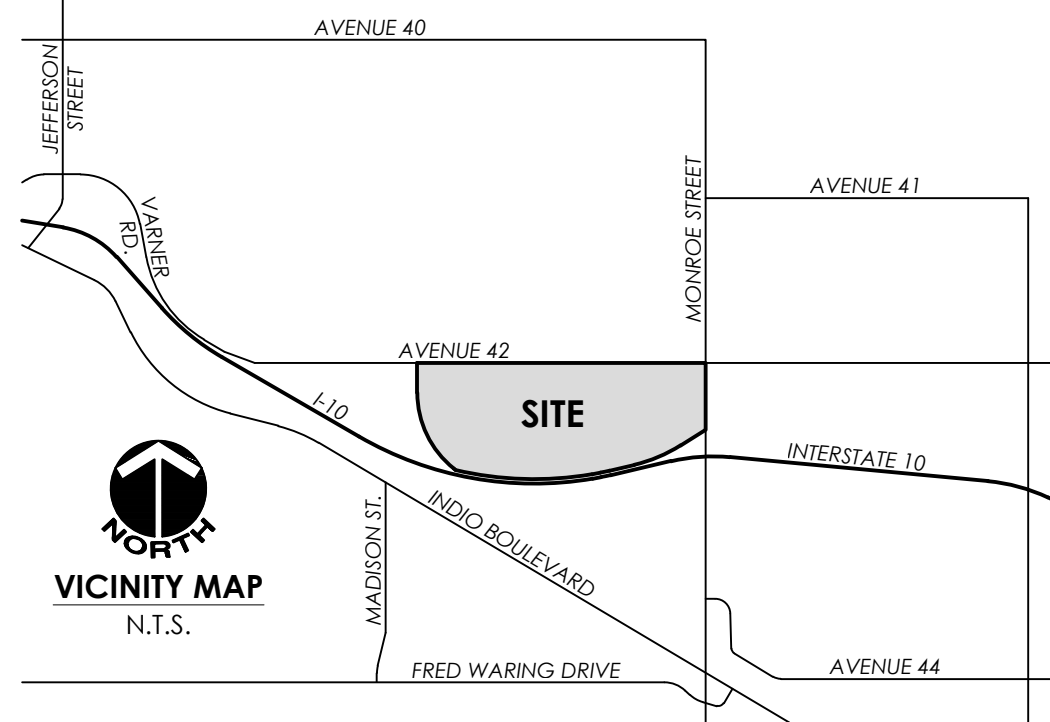
IN THE CITY OF INDIO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA			
PRELIMINARY HYDROLOGY EXHIBIT			
RCFCD SYNTHETIC UNIT (SHORTCUT METHOD)			
EXHIBIT DATE: AUGUST 17, 2023			
REVISIONS			
NO.	DATE	DESCRIPTION	
DATA TABLE			
APPLICANT / LAND OWNER:		B.H. MANAGEMENT, INC.	
ADDRESS:		11111 SANTA MONICA BOULEVARD, SUITE 600 LOS ANGELES, CALIFORNIA 90049	
CONTACT:		DAVID UM	TELEPHONE:
EXHIBIT PREPARER:		MSA CONSULTING, INC.	
ADDRESS:		34200 BOB HOPE DRIVE RANCHO MIRAGE, CALIFORNIA 92270	
CONTACT:		PAUL DEPALATIS, AICP	TELEPHONE: (760) 320-9811
SOURCE OF TOPOGRAPHY:		INLAND AERIAL SURVEYS, INC.	
ADDRESS:		7117 ARLINGTON AVENUE, SUITE "A" RIVERSIDE, CALIFORNIA 92503	
DATE OF TOPOGRAPHY:		JULY 27, 2022	TELEPHONE: (619) 606-5020
ASSESSOR'S PARCEL NUMBER:		610-020-001, -010, -012, -013, -021, -034, -036	
LEGAL DESCRIPTION:			
PARCEL 1 OF PARCEL MAP NO. 23228 P.M.B. 151/21-23, LOCATED IN SECTION 15, TOWNSHIP 5 SOUTH, RANGE 7 EAST, SAN BERNARDINO MERIDIAN.			
EXISTING ZONING:		INDUSTRIAL PARK DISTRICT (IP)	
PROPOSED ZONING:		INDUSTRIAL PARK DISTRICT (IP)	
EXISTING GENERAL PLAN LAND USE:		WORKPLACE EMPLOYMENT DISTRICT	
PROPOSED GENERAL PLAN LAND USE:		WORKPLACE EMPLOYMENT DISTRICT	
PUBLIC UTILITY PURVEYORS:			
ELECTRIC:	IMPERIAL IRRIGATION DISTRICT		(760) 335-3640
GAS:	SOUTHERN CALIFORNIA GAS COMPANY		(877) 238-0092
TELEPHONE:	FRONTIER COMMUNICATIONS		(800) 921-8101
WATER:	INDIO WATER AUTHORITY		(760) 391-4038
CABLE:	SPECTRUM		(877) 719-3278
SEWER:	VALLEY SANITARY DISTRICT		(760) 238-5400
USA:	UNDERGROUND SERVICE ALERT		(800) 227-2600
FEMA FLOOD ZONE DESIGNATION:			
ZONE "X": AREA OF MINIMAL FLOOD HAZARD			
AS SHOWN ON RIVERSIDE COUNTY, CALIFORNIA, FLOOD INSURANCE RATE MAPS, COMMUNITY PANEL MAP NUMBER: 0606SC-2251H EFFECTIVE DATE: MARCH 6, 2018			
LIQUEFACTION:		MODERATE LIQUEFACTION ZONE	
SCHOOL DISTRICT:		DESERT SANDS UNIFIED	
NOTES:		1. THIS MAP INCLUDES THE ENTIRE CONTIGUOUS OWNERSHIP OF THE LAND DIVIDER. LAND DIVIDER.	

LEGEND

→ DRAINAGE FLOW
→ TRIBUTARY AREA BOUNDARY
DRAINAGE AREA ID
AREA (AC)

LAND USE LEGEND

OFFSITE STREET
COMMERCIAL
MULTIFAMILY APARTMENTS
PROPOSED IID SUBSTATION



LEGEND	
679.3	EXISTING SPOT ELEVATIONS
(N)	EXISTING CONTOURS
(S)	EXISTING EASEMENT DELTA
(W)	EXISTING IRRIGATION DRAIN LINE
A.C.	EXISTING EASEMENT
APN	EXISTING ELECTRIC
BRDRT	EXISTING GAS
C.A.	EXISTING IRRIGATION
C&G	EXISTING LOT LINE
EX	EXISTING EDGE OF PAVEMENT
MAK	EXISTING TELEPHONE
M.B.	EXISTING OVERHEAD TELEPHONE
M.N.	EXISTING RIGHT OF WAY
NO.	EXISTING SEWER
N.T.S.	EXISTING SEWER FORCE MAIN
O/H	EXISTING WATER
OS/PP	EXISTING PROJECT BOUNDARY
P.C.	PROPOSED PROJECT BOUNDARY
P/L	PROPOSED AND EXISTING CENTER LINE
P.U.E.	PROPOSED CURB
R	PROPOSED EASEMENT
R.L.	PROPOSED LOT LINE
R/W	PROPOSED RIGHT OF WAY
STD.	PROPOSED PARKING STALLS
TYP.	
UG	

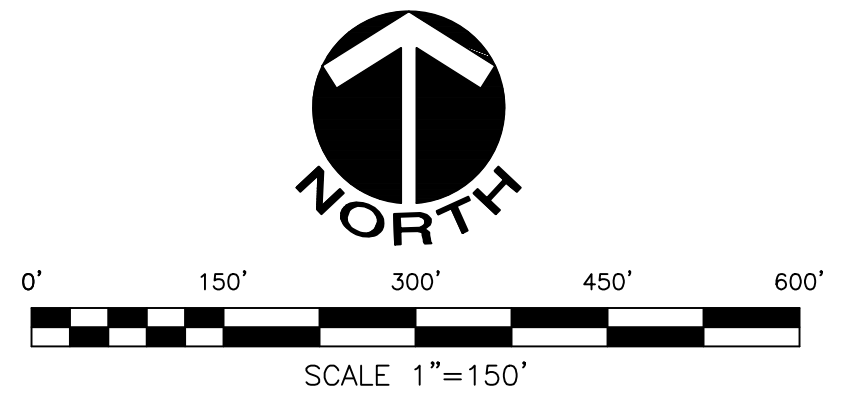
DRAINAGE AREA A	
PROPOSED LAND USE SUMMARY	
LAND USE	AREA
APARTMENTS	78.28
TOTAL AREA	78.28

STORM EVENT SUMMARY	
STORM DURATION	1 HOURS
RAINFALL VOLUME	114,000
SOIL LOSS	114,000
EFFICIENT RUN	114,000
FLOOD VOLUME	114,000
REQUIRED STORAGE	114,000
MIN. NO.	114,000
FACTORS OF SAFETY	1.15
STORAGE PROVIDED	114,000
PEAK FLOW	114,000
MINIMUM FLOW	114,000
DIFFERENCE	114,000
ESTIMATED TIME TO DOWNSTREAM BASIN	114,000
BASED ON TOTAL FLOOD VOLUME & DRAINAGE PRECIPITATION RATE	114,000

DRAINAGE AREA B	
PROPOSED LAND USE SUMMARY	
LAND USE	AREA
COMMERCIAL/INDUSTRIAL	103.78
TOTAL AREA	103.78

STORM EVENT SUMMARY	
STORM DURATION	1 HOURS
RAINFALL VOLUME	114,000
SOIL LOSS	114,000
EFFICIENT RUN	114,000
FLOOD VOLUME	114,000
REQUIRED STORAGE	114,000
MIN. NO.	114,000
FACTORS OF SAFETY	1.15
STORAGE PROVIDED	114,000
PEAK FLOW	114,000
MINIMUM FLOW	114,000
DIFFERENCE	114,000
ESTIMATED TIME TO DOWNSTREAM BASIN	114,000
BASED ON TOTAL FLOOD VOLUME & DRAINAGE PRECIPITATION RATE	114,000

TOTAL HYDROLOGIC AREA	
COMMERCIAL/INDUSTRIAL	103.78 AC
APARTMENTS	78.28 AC
TOTAL HYDROLOGIC AREA	181.75 AC



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DRAWN BY NM
CHECK BY MTC

Appendix C

Supporting Detail Related to Hydrologic Conditions of Concern
(Refer to the project specific Hydrology Report submitted under separate cover)

Appendix D

Educational Materials

- City of Indio Best Management Practices: Reducing Pollutants*
 - Checklist for Minimizing Vector Production in Stormwater Management Structures*
 - Outdoor Cleaning Activities and Professional Mobile Service Providers*
 - California Stormwater BMP Handbook - Municipal*
 - SC-41: Building and Grounds Maintenance*
 - SC-70: Road and Street Maintenance*
 - SC-73: Landscape Maintenance*
 - SC-74: Drainage System Maintenance*
 - SD-12: Efficient Irrigation*
 - SD-13: Storm Drain Signage*
-



BEST MANAGEMENT PRACTICES: REDUCING POLLUTANTS

Best Management Practices

Best Management Practices, or BMPs, are practices and procedures that residents, businesses and developers alike can employ in common activities to help reduce the potential for pollutants to enter the environment. Residents are encouraged to practice pollution prevention by incorporating best management practices into household activities. Businesses and construction sites in Indio are subject to periodic inspections to confirm that effective BMPs are in use. Remember, pollution prevention is everyone's business.

Here are examples of BMPs that can be easily employed by residents and businesses:

- **Cover areas where potential pollutants are stored.** Store trash, paints, chemicals, oily parts, and soil piles in ways that minimize contact with rainwater or other water sources. Keep materials covered, labeled, and stored in durable containers.
- **Use trash and storage containers with a tight fitting lid and no leaks.** Prevent trash, chemicals, and other materials from coming into contact with rain and washing into the storm drainage system.
- **Recycle or dispose of wastes properly.** Reduce trash by recycling. Never dump hazardous substances into the sewer, storm drain, or garbage. Recycle automotive fluids, solvents, and cleaners or dispose them at an authorized disposal facility.
- **Prevent spills and leaks, and clean up promptly when they occur.** Monitor vehicles and other equipment on a regular basis. Clean up any leakage promptly, not allowing them to evaporate or be washed down. Clean up leaks and spills with rags, damp mops, or dry absorbent materials, rather than water. Dispose of any spilled waste properly.
- **Sweep paved areas regularly.** Pick up and dispose of the debris, do not sweep it into the gutter or storm drain inlet. Avoid hosing off of paved surfaces. These materials invariably enter the storm drain system.
- **Maintain landscaping properly.** Do not sweep or blow leaves or other materials into the street or storm drain inlet. Dispose of trimmings and clippings in your green waste recycling container. Avoid over-irrigation contributing to excessive run off in the streets that could carry fertilizer and pesticide residues into storm drains. Minimize use of pesticide products by employing principles of integrated pest management.
- **Wash vehicles using water only, on unpaved surfaces, or at a carwash.** By their nature, virtually all cleaning products are toxic to aquatic life. Even products marketed as biodegradable have toxic characteristics. The term was originally intended to identify a product that was safe for biological sewage treatment processes at a time when very toxic substances were routinely discharged into the sewer system.
- **Check storm drain inlets periodically.** Check the storm drain inlet for blockage, garbage, oily waste smell, or other suspect condition and notify the City if cleanup may be needed. Notify the City if the message "Only Rain Down the Storm Drain" (pictured right) is illegible or absent. It is recommended that storm drain inlets on private property be properly identified.
- **Check for and seal any piping that carries wastewater to the storm drain.** All waste lines must be connected to the sanitary sewer system. Only clean water should go to a storm drain.



Educate others to implement water pollution prevention practices. Educate family, friends, customers, and coworkers about the causes, effects, and solutions to water pollution.



STORMWATER POLLUTION PREVENTION

What is Stormwater Pollution?

The storm drain system consists of gutters, storm drains, and channels. Most of our rainwater travels through the storm drain system and eventually into the Whitewater Channel. The largest source of stormwater pollution in the Coachella Valley results from every day activities. The most common pollutants are:

- Trash (fast-food wrappers, cigarette butts, styrofoam cups, etc.)
- Toxins (used motor oil, antifreeze, fertilizer, pesticides, sewage overflow, pet droppings, etc.)

These pollutants are picked up as water (from rain, hoses, sprinklers, etc.) drains from streets, parking lots, and lawns and enters the Whitewater Channel untreated.

Basically, anything dumped or dropped on the ground or in the gutter contributes to stormwater pollution.

Water Wasting By Over Irrigation

Over irrigation is a big problem in the City which is flat and has very few storm drain inlets to carry water off the streets. The City is enforcing its regulations through a Water Waster Notification Program. Violators are warned regarding excess run-off and water wasting. Run-off from over irrigation is a violation of the City's NPDES (stormwater) and Landscaping and Water Conservation Ordinances and guidelines. Water Wasters will not only be warned but also penalized when the new tiered system for water billing is in place in the fall of 2009.



Is Stormwater Treated Before Entering the Whitewater Channel?

No. During a storm event, water run-off is carried by the Indio storm drain system directly into the Whitewater Channel. Contaminated stormwater receives no treatment because of the sheer volume of run-off when it rains. The cost of treating Indio's stormwater would be so high that it would exceed available resources. In addition the City does not own the wastewater treatment plants for the city and has no way of treating this run off.

Is There a Difference Between a Storm Sewer and a Sanitary Sewer?

Yes. The sanitary sewer and the storm sewer are two completely separate drainage systems.

The sewer system, or sanitary wastewater system, takes all household wastewater from toilets, showers and sinks, and routes it through the collection system into the one of two water treatment facilities. Once there, it receives three levels of filtration treatment before being discharged into the Whitewater Channel.

The stormwater system, on the other hand, was intended to route rainwater quickly off the streets during a heavy storm, but unfortunately takes all urban run-off along with it. Chemicals, trash and debris from lawns, parking lots and streets, either intentionally or accidentally spilled, goes straight into the Whitewater Channel and ultimately filtrates into our groundwater.

What Are the Effects of Stormwater Pollution?

Health: Stormwater pollution can pose a serious health risk to people due to pesticides, bacteria, and chemicals that are washed from our city streets and into the Stormwater.

Neighborhoods: Clogged catch basins significantly decrease the quality of life in many neighborhoods throughout Indio. Trash and debris can attract rats and cockroaches, create foul odors, and clog the storm drain system affecting neighborhood aesthetics and may cause local flooding.

Helpful telephone numbers and links:

WATER AGENCY LIST in Riverside County

City of Banning	(951) 922-3130
City of Beaumont	(951) 769-8520
City of Blythe	(760) 922-6161
City of Coachella	(760) 398-3502
Coachella Valley Water District	(760) 398-2651
City of Corona	(951) 736-2259
Desert Center, CSA #51	(760) 227-3203
Eastern Municipal Water District	(951) 928-3777
Elsinore Valley MWD	(951) 674-3146
Farm Mutual Water Company	(951) 244-4198
City of Hemet	(951) 765-3712
Idyllwild Water District	(951) 659-2143
Jurupa Community Services District	(951) 360-8795
Lake Hemet MWD	(951) 658-3241
Lee Lake Water District	(951) 277-1414
March Air Force Base	(951) 656-7000
Mission Springs Water District	(760) 329-6448
City of Palm Springs	(760) 323-8253
Rancho Caballero	(951) 780-9272
Rancho California Water District	(951) 296-6900
Ripley, CSA #62	(760) 922-4951
City of Riverside	(951) 351-6170
Rubidoux Services District	(951) 684-7580
Silent Valley Club, Inc	(951) 849-4501
Valley Sanitary District	(760) 347-2356
Western Municipal Water District	(951) 789-5000
Yucaipa Valley Water District	(909) 797-5117

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or online at
www.rcflood.org

Online resources include:

- Riverside County Flood Control and Water Conservation District
www.rcflood.org
- California Storm Water Quality Association
www.casqa.org
- State Water Resources Control Board
www.swrcb.ca.gov/
- Power Washers of North America
www.thepwna.org

StormWater Pollution

What you should know for...

OUTDOOR CLEANING ACTIVITIES AND PROFESSIONAL MOBILE SERVICE PROVIDERS



Storm drain pollution prevention information for:

- ✓ Car Washing / Mobile Detailers
- ✓ Window and Carpet Cleaners
- ✓ Power Washers
- ✓ Waterproofers / Street Sweepers
- ✓ Equipment cleaners or degreasers and all mobile service providers

Do you know where street flows actually go?

Storm Drains are NOT connected to sanitary sewer systems and treatment plants!



The primary purpose of storm drains developed areas to prevent flooding. storm drains are transported directly streams. Soaps, degreasers, a host of materials are washed off buildings, parking areas. Vehicles and equipment must be prevent the pollution of local waterways.

is to carry rain water away from Pollutants discharged to into rivers, lakes and automotive fluids, litter and sidewalks, plazas and properly managed to

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** Always have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets and use drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Always prevent runoff water from entering storm drains.

**REPORT ILLEGAL
STORM DRAIN
DISPOSAL**
1-800-506-2555



Help Protect Our Waterways!

Use These Guidelines For Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or nearest body of water is **PROHIBITED** by law and can bring about stiff penalties.

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. *Each of us* can do our part to keep storm water clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose *small amounts* of power washing waste water to landscaped, gravel or unpaved surfaces.

Do...check with your local sanitary sewer agency's policies on wash water disposal regulations. (See list on reverse side).

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.



**Report illegal storm drain disposal,
Call Toll Free
1-800-506-2555**

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them for being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.



When cleaning surfaces with a *high-pressure washer* or *steam cleaner*, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks.

Screening Wash Water

A thorough dry cleanup before washing exterior surfaces, such as buildings and decks *without loose paint*, sidewalks, or plaza areas should be sufficient to protect receiving waters. Keep debris from entering the storm drain after cleaning by first passing the wash water first through a "20 mesh" or finer screen to catch the solid materials, then disposing the mesh in a refuse container.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or rubber mats.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Equipment and Supplies

For special materials, equipment and supplies:

- New Pig — (800) 468-4647
- Lab Safety Supply — (800) 356-0783
- C&H — (800) 558-90966
- W.W. Grainger — (800) 994-9174
- Cleaning Equipment Trade Association — (800) 441-0111

Adopt a pet from your local animal shelter or adoption centers at pet stores. A variety of animals, from purebred to mixed breed are waiting for loving arms and good homes. Consider volunteering at your local animal shelters. Volunteers, donations, food, newspapers, old towels and linens are needed to help the animals.



RIVERSIDE COUNTY
ANIMAL SHELTER LOCATIONS:

BLYTHE
16450 West Hobson Way
Blythe, CA 92225
760-921-7857

HEMET
800 South Sanderson
Hemet, CA 92545
909 925-8025

INDIO
45-355 Van Buren
Indio, CA 92201
760-347-2319

RIVERSIDE
5950 Wilderness Avenue
Riverside, CA 92504
909-358-7387

FOR ALL OTHER AREAS
CALL 1-888-636-7387

Riverside County gratefully acknowledges the City of Los Angeles Stormwater Program for the design concept of this brochure.

What's the Scoop?



TIPS FOR A HEALTHY PET AND A HEALTHIER ENVIRONMENT

CREATE A HEALTHY ENVIRONMENT in and around your home by following these simple pet practices. Your pet, family and neighbors will appreciate their clean comfortable surroundings.

HOUSEHOLD PETS

We all love our pets, but pet waste is a subject everyone likes to avoid. Pet waste left on trails, sidewalks, streets, and grassy areas is immediately flushed into the nearest waterway when it rains. Even if you can't see water near you, the rain or waste water WASHES all that PET WASTE and BACTERIA INTO THE STORMDRAIN, where it travels to your neighborhood creek or lake untreated. These animal droppings also contain nutrients that can promote the growth of algae, if they enter our streams and lakes. The risk of STORMWATER CONTAMINATION INCREASES, if pet wastes is allowed to accumulate in animal pen areas or left on sidewalks, streets, or driveways where runoff can carry them to storm sewers.

Some of the DISEASES THAT CAN SPREAD from pet waste are:

Campylobacteriosis — a bacterial infection that causes diarrhea in humans.
Salmonellosis — the most common bacterial infection transmitted to humans from animals.
Toxocariasis — roundworms transmitted from animals to humans.

Flies and other pest insects can also increase when pet waste is disposed of improperly, becoming a nuisance and adding yet another vector for disease transmission.

WHAT CAN YOU DO?

- **SCOOP** up pet waste and flush it down the toilet.
- **NEVER DUMP** pet waste into a storm drain or catch basin.
- **USE** the complimentary BAGS or mutt mitts offered in dispensers at local parks.
- **CARRY EXTRA BAGS** when walking your dog and make them available to other pet owners who are without.
- **TEACH CHILDREN** how to properly clean up after a pet.
- **TELL FRIENDS AND NEIGHBORS** about the ill effects of animal waste on the environment. Encourage them to clean up after pets.

Did You Know ...

that Californians illegally dump about 80 million gallons of motor oil each year?

Many communities have "Scoop the Poop" laws that govern pet waste cleanup. Some of these laws specifically require anyone who walks an animal off of their property to carry a bag, shovel, or scooper. Any waste left by the animal must be cleaned up immediately. CALL YOUR LOCAL CODE ENFORCEMENT OFFICER to find out more about pet waste regulations.



Pets are only one of the many fixtures of suburban America that add to water pollution. Lawn fertilizers, rinse water from driveways and motor oil commonly end up in streams and lakes. CALL 1-800-506-2555 FOR HOUSEHOLD HAZARDOUS WASTE COLLECTION LOCATION AND DATES. Maintain your automobile to avoid leaks. Dispose of used vehicle fluids properly. Your pets can be poisoned if they ingest gas, oil or antifreeze that drips onto the pavement or is stored in open containers.

NEVER HOSE VEHICLE FLUIDS into the street or gutter. USE ABSORBENT

MATERIALS such as cat litter to clean-up spills. SWEEP UP used absorbent materials and place in the trash.

HORSES AND LIVESTOCK

Fortunate enough to own a horse or livestock? You, too, can play a part in protecting and cleaning up our water resources. The following are a few simple Best Management Practices (BMPs) specifically designed for horse owners and landowners with horses.



- **STORE** your manure properly. Do not store unprotected piles of manure in places where runoff may enter streams, or flood waters may wash the manure away. Place a cover or tarp over the pile to keep rainwater out.
- **CHECK** with your local conservation district to design manure storage facilities to protect water quality. These structures usually consist of a concrete pad to protect ground water and a short wall on one or two sides to make manure handling easier.

- **TRY** composting - A vegetative cover placed around buildings or on steeper slopes can help minimize erosion and absorb nutrients while improving the appearance of your property. In addition, avoid costlier erosion controls, vegetative covers will provide animals with better traction during wet or icy conditions.



- **KEEP** animals out of streams - Designed stream crossings provide a safe, easy way for horses and livestock to ford streams. Fencing encourages the use of the crossing instead of the streambed to navigate streams. This will allow vegetation to stabilize stream banks and reduce sediment pollution.
- **MOW** pastures to proper height, six inches is typically recommended.
- **Material STORAGE SAFETY TIPS** - Many of the chemicals found in barns require careful handling and proper disposal. When using these chemicals, be certain to follow these common sense guidelines:
 - Buy only what you need.

- Treat spills of hoof oils like fuel spill. Use kitty litter to soak up the oil and dispose in a tightly sealed plastic bag.
- Store pesticides in a locked, dry, well-ventilated area.
- Protect stored fertilizer and pesticides from rain and surface water.

Call 1-800-506-2555 to locate your local conservation district to find out what to do with your current backyard manure pile, how to re-establish a healthy pasture, what to do about weeds, and what grasses grow best in your soils.

Thank you for doing your part to protect your watershed, the environment, and the equestrian way of life in your community!



Helpful telephone numbers and links:

RIVERSIDE COUNTY WATER AGENCIES:

City of Banning	(951) 922-3130
City of Beaumont	(951) 769-8520
City of Blythe	(760) 922-6161
City of Coachella	(760) 358-3502
Coachella Valley Water District	(760) 368-2651
City of Corona	(951) 736-2256
Desert Center, CSA #51	(760) 227-3203
Eastern Municipal Water District	(951) 928-3777
Elmore Valley MWD	(951) 374-3144
Farm Mutual Water Company	(951) 244-4196
City of Hemet	(951) 765-3712
Inland Water District	(951) 928-2142
Jurupa Community Services District	(951) 360-4795
Lake Hemet MWD	(951) 858-3241
Leo Lake Water District	(951) 277-1414
March Air Force Base	(951) 556-7000
Mission Springs Water District	(760) 329-6448
City of Palm Springs	(760) 325-8252
Rancho Calabazas	(951) 780-8272
Rancho California Water District	(951) 256-8800
Ripley, CSA #62	(760) 322-4654
City of Riverside	(951) 351-6170
Rubicon Community Services District	(951) 654-7580
Silent Valley Club, Inc.	(951) 848-4501
Valley Sanitary District	(760) 347-2336
Western Municipal Water District	(951) 789-5000
Yorba Valley Water District	(949) 787-5117

CALL 1-800-506-2555 to:

- Report clogged storm drains or illegal storm drain disposal from residential, industrial, construction and commercial sites into public streets, storm drains and/or water bodies.
- Find out about our various storm drain pollution prevention materials.
- Locate the dates and times of Household Hazardous Waste (HHW) Collector Event.
- Request adult neighborhood or classroom presentations.
- Locate other County environmental services.
- Receive recycling information and composing workshop information.

Or visit our (Riverside County Flood Control District website at: www.floodcontrol.co.riverside.ca.us)

Other links to additional storm drain pollution information:

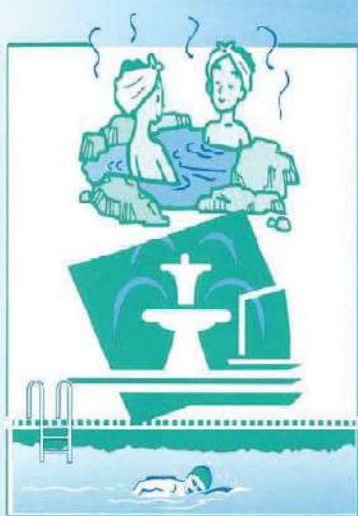
- County of Riverside Environmental Health: www.rvcet.org
- California State Water Resource Conservation Board: www.water.ca.gov/stormwaterlinks.html
- California Water Quality Task Force: www.cwtft.org
- United States Environmental Protection Agency (EPA): www.epa.gov/cpl/p2/p2home/p2programs/budgets.htm (compliance assistance information).



Riverside County Only Rain in the Storm Drain Pollution Protection Program gratefully acknowledges the Boy Scouts of America Management Agencies Association and the Cleaning Equipment Trade Association for information provided in this brochure.

StormWater Pollution

What you should know for...



Swimming Pool, Jacuzzi and Fountain Maintenance

Do you know... where the water actually goes?



Storm Drains are not connected to sanitary sewer systems and treatment plants!

The primary purpose of storm drains is to carry rain water away from developed areas to prevent flooding. Untreated storm water and the pollutants it carries flow directly into rivers, lakes, and streams. Wastewater from residential swimming pools, jacuzzis, fishponds, and fountains often contain chemicals used for sanitizing or cleansing purposes. Toxic chemicals (such as chlorine or copper-based algaecides) can damage the environment when wastewater is allowed to flow into our local rivers, lakes, and streams by way of the storm drain system. Each of us can do our part to help clean our water, and that adds up to a pollution solution.

The Cities and County of Riverside have adopted ordinances for storm drain pollution management to maintain discharge control and prevent illegal storm drain discharge. In accordance with state and federal law, these local storm water ordinances prohibit the discharge of pollutants into the storm drain system or local surface waters. The Only Rain in the Storm Drain Pollution Program informs residents and businesses of storm drain pollution prevention activities such as those described in this brochure.



PLEASE NOTE: The discharge of pollutants into the street, gutters, storm drain system, or waterways – without a Regional Water Quality Control board permit or waiver – is strictly prohibited by local ordinances and state and federal law.

Do Your Part to Protect Our Waterways!

Use These Guidelines For Proper Draining of Your Swimming Pool, Jacuzzi and Fountain Water

Discharge Regulations

Requirements for pool draining may differ from city to city. Check with your water agency to see if disposal to the sanitary sewer line is allowed for pool discharge (see reverse side for Riverside County water purveyors).



If sewer discharge is allowed, a hose can be run from your swimming pool pump to the washing machine drain or a sink or bathtub. If sewer discharge is not allowed, or if your house is served by a septic tank, review the options presented below.

Discharge Options

If your local sewer will not accept pool water into their system, or if you are on a septic tank system, follow these guidelines:

1. Reduce or eliminate solids (e.g., debris, leaves or dirt) in the pool water.
2. Allow the chemicals in the pool water to dissipate. This could take up to seven (7) days depending on the time of year. Create a co-op; let your neighbor share your pool while theirs is being prepared for draining, then use their pool while yours is being drained. Chlorinated water should not be discharged into the storm drain or surface waters. This includes large pools such as community swimming pools or spas.
3. When the pool water is free of all chemicals (verify by a home pool water test kit) drain pool water to landscaped areas, lawns, yards, or any areas that will absorb the water.
4. You may have to drain the pool water over a period of a few days to allow the landscape areas to absorb most of the water.
5. Control the flow of the draining pool water to prevent soil erosion. Do not allow sediment to enter the street, gutter or storm drain.
6. Avoid discharging pool water into the street and storm drain system. Water runoff that enters the street can pick up motor oil, pet waste, trash and other pollutants, eventually carrying them into the storm drain system and local surface waters.



Refinishing Pool Surfaces

If you are resurfacing your pool, or resurfacing the pool patio area, be sure to hose down mixers, tools and trailers in a dirt area where rinse water won't flow into the street, gutter or storm drain. Local storm water ordinances strictly prohibit the discharge of pollutants into the storm drain system.

Residues from acid washing and similar activities require special handling. Never discharge low or high pH wastewater into the street, gutter or storm drain.

Cleaning Filters

Discharge of pool filter rinse water and backflush to a stream, ditch, or storm drain is prohibited. Backflush from pool filters must be discharged to the sanitary sewer, on-site septic tank and drainfield system (if properly designed and adequately sized), or a seepage pit. Alternatively, pool filter rinse water and backwash may be diverted to dirt or landscaped areas. Filter media and other solids should be picked up and disposed of in the trash.

Chemical Storage and Handling

- Use only the amount indicated on product labels.
- Store chlorine and other chemicals in a covered area to prevent runoff. Keep out of reach of children and pets.
- Chlorine kits, available at retail swimming pool equipment and supply stores, should be used to monitor the chlorine and pH levels.
- Chlorine and other pool chemicals should never be allowed to flow into the gutter or the storm drain system.



Algaecides

Avoid using copper-based algaecides unless absolutely necessary. Control algae with chlorine, organic polymers or other alternatives to copper-based pool chemicals. Copper is a heavy metal that can be toxic to aquatic life.



Proper Disposal of Pool Chemicals

If you need to dispose of unwanted pool chemicals, first try giving them to a neighbor with a pool. If that doesn't work, bring unwanted pool chemicals to a Household Hazardous Waste (HHW) Collection Event. There's no cost for bringing HHW items to collection events - it's FREE! Call 1-800-506-2555 for a schedule of HHW events in your community.

NEVER put unused chemicals in the trash, onto the ground or down a storm drain.

Building & Grounds Maintenance SC-41

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Switch to non-toxic chemicals for maintenance to the maximum extent possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Encourage proper lawn management and landscaping, including use of native vegetation.
- ☐ Encourage use of Integrated Pest Management techniques for pest control.
- ☐ Encourage proper onsite recycling of yard trimmings.
- ☐ Recycle residual paints, solvents, lumber, and other material as much as possible.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	✓
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	✓
<i>Oil and Grease</i>	
<i>Organics</i>	

Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling & Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



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- Clean work areas at the end of each work shift using dry cleaning methods such as sweeping and vacuuming.



Good Housekeeping

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils. See also SC-40, Contaminated and Erodible Areas, for more information.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and

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solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- ❑ If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- ❑ Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- ❑ Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- ❑ Use mulch or other erosion control measures when soils are exposed.
- ❑ Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- ❑ Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- ❑ Use hand weeding where practical.

Fertilizer and Pesticide Management

- ❑ Do not use pesticides if rain is expected.
- ❑ Do not mix or prepare pesticides for application near storm drains.
- ❑ Use the minimum amount needed for the job.
- ❑ Calibrate fertilizer distributors to avoid excessive application.
- ❑ Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- ❑ Apply pesticides only when wind speeds are low.
- ❑ Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- ❑ Irrigate slowly to prevent runoff and then only as much as is needed.
- ❑ Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.

Inspection

- ❑ Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

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Spill Response and Prevention Procedures

- ☐ Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- ☐ Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- ☐ Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- ☐ Clean up spills immediately.



Material Handling and Waste Management

- ☐ Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- ☐ Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- ☐ Dispose of empty pesticide containers according to the instructions on the container label.
- ☐ Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- ☐ Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.



Employee Training Program

- ☐ Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- ☐ Train employees and contractors in proper techniques for spill containment and cleanup.
- ☐ Be sure the frequency of training takes into account the complexity of the operations and the needs of individual staff.



Quality Assurance and Record Keeping

- ☐ Keep accurate logs that document maintenance activities performed and minimum BMP measures implemented.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

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Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Additional capital costs are not anticipated for building and grounds maintenance. Implementation of the minimum BMPs described above should be conducted as part of regular site operations.

Maintenance

- Maintenance activities for the BMPs described above will be minimal, and no additional cost is anticipated.

Supplemental Information

Fire Sprinkler Line Flushing

Site fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

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Description

Streets, roads, and highways are significant sources of pollutants in stormwater discharges, and operation and maintenance (O&M) practices, if not conducted properly, can contribute to the problem. Stormwater pollution from roadway and bridge maintenance should be addressed on a site-specific basis. Use of the procedures outlined below, that address street sweeping and repair, bridge and structure maintenance, and unpaved roads will reduce pollutants in stormwater.

Approach

Pollution Prevention

- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal)
- Recycle paint and other materials whenever possible.
- Enlist the help of citizens to keep yard waste, used oil, and other wastes out of the gutter.

Suggested Protocols

Street Sweeping and Cleaning

- Maintain a consistent sweeping schedule. Provide minimum monthly sweeping of curbed streets.
- Perform street cleaning during dry weather if possible.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☒
Nutrients	
Trash	☒
Metals	☒
Bacteria	
Oil and Grease	☒
Organics	☒
Oxygen Demanding	☒



- Avoid wet cleaning or flushing of street, and utilize dry methods where possible.
- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc. For example:
 - Increase the sweeping frequency for streets with high pollutant loadings, especially in high traffic and industrial areas.
 - Increase the sweeping frequency just before the wet season to remove sediments accumulated during the summer.
 - Increase the sweeping frequency for streets in special problem areas such as special events, high litter or erosion zones.
- Maintain cleaning equipment in good working condition and purchase replacement equipment as needed. Old sweepers should be replaced with new technologically advanced sweepers (preferably regenerative air sweepers) that maximize pollutant removal.
- Operate sweepers at manufacturer requested optimal speed levels to increase effectiveness.
- To increase sweeping effectiveness consider the following:
 - Institute a parking policy to restrict parking in problematic areas during periods of street sweeping.
 - Post permanent street sweeping signs in problematic areas; use temporary signs if installation of permanent signs is not possible.
 - Develop and distribute flyers notifying residents of street sweeping schedules.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- If available use vacuum or regenerative air sweepers in the high sediment and trash areas (typically industrial/commercial).
- Keep accurate logs of the number of curb-miles swept and the amount of waste collected.
- Dispose of street sweeping debris and dirt at a landfill.
- Do not store swept material along the side of the street or near a storm drain inlet.
- Keep debris storage to a minimum during the wet season or make sure debris piles are contained (e.g. by berming the area) or covered (e.g. with tarps or permanent covers).

Street Repair and Maintenance

Pavement marking

- Schedule pavement marking activities for dry weather.

- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Provide drop cloths and drip pans in paint mixing areas.
- Properly maintain application equipment.
- Street sweep thermoplastic grindings. Yellow thermoplastic grindings may require special handling as they may contain lead.
- Paints containing lead or tributyltin are considered a hazardous waste and must be disposed of properly.
- Use water based paints whenever possible. If using water based paints, clean the application equipment in a sink that is connected to the sanitary sewer.
- Properly store leftover paints if they are to be kept for the next job, or dispose of properly.

Concrete installation and repair

- Schedule asphalt and concrete activities for dry weather.
- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place sand bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- When making saw cuts in pavement, use as little water as possible and perform during dry weather. Cover each storm drain inlet completely with filter fabric or plastic during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site. Alternatively, a small onsite vacuum may be used to pick up the slurry as this will prohibit slurry from reaching storm drain inlets.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Patching, resurfacing, and surface sealing

- Schedule patching, resurfacing and surface sealing for dry weather.
- Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, cover stockpiles with plastic tarps or berm around them if necessary to prevent transport of materials in runoff.
- Pre-heat, transfer or load hot bituminous material away from drainage systems or watercourses.
- Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and maintenance holes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from covered maintenance holes and storm drain inlets when the job is complete.
- Prevent excess material from exposed aggregate concrete or similar treatments from entering streets or storm drain inlets. Designate an area for clean up and proper disposal of excess materials.
- Use only as much water as necessary for dust control, to avoid runoff.
- Sweep, never hose down streets to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Equipment cleaning maintenance and storage

- Inspect equipment daily and repair any leaks. Place drip pans or absorbent materials under heavy equipment when not in use.
- Perform major equipment repairs at the corporation yard, when practical.
- If refueling or repairing vehicles and equipment must be done onsite, use a location away from storm drain inlets and watercourses.
- Clean equipment including sprayers, sprayer paint supply lines, patch and paving equipment, and mud jacking equipment at the end of each day. Clean in a sink or other area (e.g. vehicle wash area) that is connected to the sanitary sewer.

*Bridge and Structure Maintenance**Paint and Paint Removal*

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Do not transfer or load paint near storm drain inlets or watercourses.

- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint container.
- Plug nearby storm drain inlets prior to starting painting where there is significant risk of a spill reaching storm drains. Remove plugs when job is completed.
- If sand blasting is used to remove paint, cover nearby storm drain inlets prior to starting work.
- Perform work on a maintenance traveler or platform, or use suspended netting or tarps to capture paint, rust, paint removing agents, or other materials, to prevent discharge of materials to surface waters if the bridge crosses a watercourse. If sanding, use a sander with a vacuum filter bag.
- Capture all clean-up water, and dispose of properly.
- Recycle paint when possible (e.g. paint may be used for graffiti removal activities). Dispose of unused paint at an appropriate household hazardous waste facility.

Graffiti Removal

- Schedule graffiti removal activities for dry weather.
- Protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.
- When graffiti is removed by painting over, implement the procedures under Painting and Paint Removal above.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a landscaped or dirt area. If such an area is not available, filter runoff through an appropriate filtering device (e.g. filter fabric) to keep sand, particles, and debris out of storm drains.
- If a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound), plug nearby storm drains and vacuum/pump wash water to the sanitary sewer.
- Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).

Repair Work

- Prevent concrete, steel, wood, metal parts, tools, or other work materials from entering storm drains or watercourses.
- Thoroughly clean up the job site when the repair work is completed.
- When cleaning guardrails or fences follow the appropriate surface cleaning methods (depending on the type of surface) outlined in SC-71 Plaza & Sidewalk Cleaning fact sheet.

- If painting is conducted, follow the painting and paint removal procedures above.
- If graffiti removal is conducted, follow the graffiti removal procedures above.
- If construction takes place, see the Construction Activity BMP Handbook.
- Recycle materials whenever possible.

Unpaved Roads and Trails

- Stabilize exposed soil areas to prevent soil from eroding during rain events. This is particularly important on steep slopes.
- For roadside areas with exposed soils, the most cost-effective choice is to vegetate the area, preferably with a mulch or binder that will hold the soils in place while the vegetation is establishing. Native vegetation should be used if possible.
- If vegetation cannot be established immediately, apply temporary erosion control mats/blankets; a comma straw, or gravel as appropriate.
- If sediment is already eroded and mobilized in roadside areas, temporary controls should be installed. These may include: sediment control fences, fabric-covered triangular dikes, gravel-filled burlap bags, biobags, or hay bales staked in place.

Non-Stormwater Discharges

Field crews should be aware of non-stormwater discharges as part of their ongoing street maintenance efforts.

- Refer to SC-10 Non-Stormwater Discharges
- Identify location, time and estimated quantity of discharges.
- Notify appropriate personnel.

Training

- Train employees regarding proper street sweeping operation and street repair and maintenance.
- Instruct employees and subcontractors to ensure that measures to reduce the stormwater impacts of roadway/bridge maintenance are being followed.
- Require engineering staff and/or consulting A/E firms to address stormwater quality in new bridge designs or existing bridge retrofits.
- Use a training log or similar method to document training.
- Train employees on proper spill containment and clean up, and in identifying non-stormwater discharges.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Densely populated areas or heavily used streets may require parking regulations to clear streets for cleaning.
- No currently available conventional sweeper is effective at removing oil and grease. Mechanical sweepers are not effective at removing finer sediments.
- Limitations may arise in the location of new bridges. The availability and cost of land and other economic and political factors may dictate where the placement of a new bridge will occur. Better design of the bridge to control runoff is required if it is being placed near sensitive waters.

Requirements

Costs

- The maintenance of local roads and bridges is already a consideration of most community public works or transportation departments. Therefore, the cost of pollutant reducing management practices will involve the training and equipment required to implement these new practices.
- The largest expenditures for street sweeping programs are in staffing and equipment. The capital cost for a conventional street sweeper is between \$60,000 and \$120,000. Newer technologies might have prices approaching \$180,000. The average useful life of a conventional sweeper is about four years, and programs must budget for equipment replacement. Sweeping frequencies will determine equipment life, so programs that sweep more often should expect to have a higher cost of replacement.
- A street sweeping program may require the following.
 - Sweeper operators, maintenance, supervisory, and administrative personnel are required.
 - Traffic control officers may be required to enforce parking restrictions.
 - Skillful design of cleaning routes is required for program to be productive.
 - Arrangements must be made for disposal of collected wastes.

- If investing in newer technologies, training for operators must be included in operation and maintenance budgets. Costs for public education are small, and mostly deal with the need to obey parking restrictions and litter control. Parking tickets are an effective reminder to obey parking rules, as well as being a source of revenue.

Maintenance

- Not applicable

Supplemental Information***Further Detail of the BMP******Street sweeping***

There are advantages and disadvantages to the two common types of sweepers. The best choice depends on your specific conditions. Many communities find it useful to have a compliment of both types in their fleet.

Mechanical Broom Sweepers - More effective at picking up large debris and cleaning wet streets. Less costly to purchase and operate. Create more airborne dust.

Vacuum Sweepers - More effective at removing fine particles and associated heavy metals. Ineffective at cleaning wet streets. Noisier than mechanical broom sweepers which may restrict areas or times of operation. May require an advance vehicle to remove large debris.

Street Flushers - Not affected by biggest interference to cleaning, parked cars. May remove finer sediments, moving them toward the gutter and stormwater inlets. For this reason, flushing fell out of favor and is now used primarily after sweeping. Flushing may be effective for combined sewer systems. Presently street flushing is not allowed under most NPDES permits.

Cross-Media Transfer of Pollutants

The California Air Resources Board (ARB) has established state ambient air quality standards including a standard for respirable particulate matter (less than or equal to 10 microns in diameter, symbolized as PM₁₀). In the effort to sweep up finer sediments to remove attached heavy metals, municipalities should be aware that fine dust, that cannot be captured by the sweeping equipment and becomes airborne, could lead to issues of worker and public safety.

Bridges

Bridges that carry vehicular traffic generate some of the more direct discharges of runoff to surface waters. Bridge scupper drains cause a direct discharge of stormwater into receiving waters and have been shown to carry relatively high concentrations of pollutants. Bridge maintenance also generates wastes that may be either directly deposited to the water below or carried to the receiving water by stormwater. The following steps will help reduce the stormwater impacts of bridge maintenance:

- Site new bridges so that significant adverse impacts to wetlands, sensitive areas, critical habitat, and riparian vegetation are minimized.

- Design new bridges to avoid the use of scupper drains and route runoff to land for treatment control. Existing scupper drains should be cleaned on a regular basis to avoid sediment/debris accumulation.
- Reduce the discharge of pollutants to surface waters during maintenance by using suspended traps, vacuums, or booms in the water to capture paint, rust, and paint removing agents. Many of these wastes may be hazardous. Properly dispose of this waste by referring to CA21 (Hazardous Waste Management) in the Construction Handbook.
- Train employees and subcontractors to reduce the discharge of wastes during bridge maintenance.

De-icing

- Do not over-apply deicing salt and sand, and routinely calibrate spreaders.
- Near reservoirs, restrict the application of deicing salt and redirect any runoff away from reservoirs.
- Consider using alternative deicing agents (less toxic, biodegradable, etc.).

References and Resources

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Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as nativescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☒



- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols***Mowing, Trimming, and Weeding***

- Whenever possible use mechanical methods of vegetation removal (e.g mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
 - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
 - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
 - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
 - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
 - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
 - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
 - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in “agricultural use” areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information***Further Detail of the BMP******Waste Management***

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line:
<http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities
http://ladpw.org/wmd/npdes/model_links.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

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http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm



Photo Credit: Geoff Brosseau

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff that may contain certain pollutants. Maintaining catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Approach

Suggested Protocols

Catch Basins/Inlet Structures

- Municipal staff should regularly inspect facilities to ensure the following:
 - Immediate repair of any deterioration threatening structural integrity.
 - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
 - Stenciling of catch basins and inlets (see SC-75 Waste Handling and Disposal).
- Clean catch basins, storm drain inlets, and other conveyance structures in high pollutant load areas just before the wet season to remove sediments and debris accumulated during the summer.

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	☒
Oil and Grease	☒
Organics	☒
Oxygen Demanding	☒



- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Record the amount of waste collected.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed of. Do not dewater near a storm drain or stream.
- Except for small communities with relatively few catch basins that may be cleaned manually, most municipalities will require mechanical cleaners such as eductors, vacuums, or bucket loaders.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect flushed effluent and pump to the sanitary sewer for treatment.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge from cleaning a storm drain pump station or other facility to reach the storm drain system.
- Conduct quarterly routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.
- Sample collected sediments to determine if landfill disposal is possible, or illegal discharges in the watershed are occurring.

Open Channel

- Consider modification of storm channel characteristics to improve channel hydraulics, to increase pollutant removals, and to enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a stream or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies

(SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS

Illicit Connections and Discharges

- During routine maintenance of conveyance system and drainage structures field staff should look for evidence of illegal discharges or illicit connections:
 - Is there evidence of spills such as paints, discoloring, etc.
 - Are there any odors associated with the drainage system
 - Record locations of apparent illegal discharges/illicit connections
 - Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of up gradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
 - Once the origin of flow is established, require illicit discharger to eliminate the discharge.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
 - Illegal dumping hot spots
 - Types and quantities (in some cases) of wastes
 - Patterns in time of occurrence (time of day/night, month, or year)
 - Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills)
 - Responsible parties
- Post “No Dumping” signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

- The State Department of Fish and Game has a hotline for reporting violations called Cal TIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).
- The California Department of Toxic Substances Control's Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Only properly trained individuals are allowed to handle hazardous materials/wastes.
- Train municipal employees from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report illegal dumping.
- Train municipal employees and educate businesses, contractors, and the general public in proper and consistent methods for disposal.
- Train municipal staff regarding non-stormwater discharges (See SC-10 Non-Stormwater Discharges).

Spill Response and Prevention

- Refer to SC-11, Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Cleanup activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and disposal of flushed effluent to sanitary sewer may be prohibited in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Private property access rights may be needed to track illegal discharges up gradient.

- Requirements of municipal ordinance authority for suspected source verification testing for illicit connections necessary for guaranteed rights of entry.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget. A careful study of cleaning effectiveness should be undertaken before increased cleaning is implemented. Catch basin cleaning costs are less expensive if vacuum street sweepers are available; cleaning catch basins manually can cost approximately twice as much as cleaning the basins with a vacuum attached to a sweeper.
- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary. Encouraging reporting of illicit discharges by employees can offset costs by saving expense on inspectors and directing resources more efficiently. Some programs have used funds available from “environmental fees” or special assessment districts to fund their illicit connection elimination programs.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Identifying illicit discharges requires teams of at least two people (volunteers can be used), plus administrative personnel, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Requires technical staff to detect and investigate illegal dumping violations, and to coordinate public education.

Supplemental Information

Further Detail of the BMP

Storm Drain flushing

Sanitary sewer flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in sanitary sewer systems. The same principles that make sanitary sewer flushing effective can be used to flush storm drains. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as to an open channel, to another point where flushing will be initiated, or over to the sanitary sewer and on to the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents “plug flow” discharges of concentrated pollutant loadings and sediments. The deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to

cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce the impacts of stormwater pollution, a second inflatable device, placed well downstream, may be used to re-collect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to re-collect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75 percent for organics and 55-65 percent for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm drain flushing.

Flow Management

Flow management has been one of the principal motivations for designing urban stream corridors in the past. Such needs may or may not be compatible with the stormwater quality goals in the stream corridor.

Downstream flood peaks can be suppressed by reducing through flow velocity. This can be accomplished by reducing gradient with grade control structures or increasing roughness with boulders, dense vegetation, or complex banks forms. Reducing velocity correspondingly increases flood height, so all such measures have a natural association with floodplain open space. Flood elevations laterally adjacent to the stream can be lowered by increasing through flow velocity.

However, increasing velocity increases flooding downstream and inherently conflicts with channel stability and human safety. Where topography permits, another way to lower flood elevation is to lower the level of the floodway with drop structures into a large but subtly excavated bowl where flood flows are allowed to spread out.

Stream Corridor Planning

Urban streams receive and convey stormwater flows from developed or developing watersheds. Planning of stream corridors thus interacts with urban stormwater management programs. If local programs are intended to control or protect downstream environments by managing flows delivered to the channels, then it is logical that such programs should be supplemented by management of the materials, forms, and uses of the downstream riparian corridor. Any proposal for stream alteration or management should be investigated for its potential flow and stability effects on upstream, downstream, and laterally adjacent areas. The timing and rate of flow from various tributaries can combine in complex ways to alter flood hazards. Each section of channel is unique, influenced by its own distribution of roughness elements, management activities, and stream responses.

Flexibility to adapt to stream features and behaviors as they evolve must be included in stream reclamation planning. The amenity and ecology of streams may be enhanced through the landscape design options of 1) corridor reservation, 2) bank treatment, 3) geomorphic restoration, and 4) grade control.

Corridor reservation - Reserving stream corridors and valleys to accommodate natural stream meandering, aggradation, degradation, and over bank flows allows streams to find their own form and generate less ongoing erosion. In California, open stream corridors in recent urban developments have produced recreational open space, irrigation of streamside plantings, and the aesthetic amenity of flowing water.

Bank treatment - The use of armoring, vegetative cover, and flow deflection may be used to influence a channel's form, stability, and biotic habitat. To prevent bank erosion, armoring can be done with rigid construction materials, such as concrete, masonry, wood planks and logs, riprap, and gabions. Concrete linings have been criticized because of their lack of provision of biotic habitat. In contrast, riprap and gabions make relatively porous and flexible linings. Boulders, placed in the bed reduce velocity and erosive power.

Riparian vegetation can stabilize the banks of streams that are at or near a condition of equilibrium. Binding networks of roots increase bank shear strength. During flood flows, resilient vegetation is forced into erosion-inhibiting mats. The roughness of vegetation leads to lower velocity, further reducing erosive effects. Structural flow deflection can protect banks from erosion or alter fish habitat. By concentrating flow, a deflector causes a pool to be scoured in the bed.

Geomorphic restoration – Restoration refers to alteration of disturbed streams so their form and behavior emulate those of undisturbed streams. Natural meanders are retained, with grading to gentle slopes on the inside of curves to allow point bars and riffle-pool sequences to develop. Trees are retained to provide scenic quality, biotic productivity, and roots for bank stabilization, supplemented by plantings where necessary.

A restorative approach can be successful where the stream is already approaching equilibrium. However, if upstream urbanization continues new flow regimes will be generated that could disrupt the equilibrium of the treated system.

Grade Control - A grade control structure is a level shelf of a permanent material, such as stone, masonry, or concrete, over which stream water flows. A grade control structure is called a sill, weir, or drop structure, depending on the relation of its invert elevation to upstream and downstream channels.

A sill is installed at the preexisting channel bed elevation to prevent upstream migration of nick points. It establishes a firm base level below which the upstream channel can not erode.

A weir or check dam is installed with invert above the preexisting bed elevation. A weir raises the local base level of the stream and causes aggradation upstream. The gradient, velocity, and erosive potential of the stream channel are reduced. A drop structure lowers the downstream invert below its preexisting elevation, reducing downstream gradient and velocity. Weirs and drop structure control erosion by dissipating energy and reducing slope velocity.

When carefully applied, grade control structures can be highly versatile in establishing human and environmental benefits in stabilized channels. To be successful, application of grade control structures should be guided by analysis of the stream system both upstream and downstream from the area to be reclaimed.

Examples

The California Department of Water Resources began the Urban Stream Restoration Program in 1985. The program provides grant funds to municipalities and community groups to implement stream restoration projects. The projects reduce damages from streambank and watershed instability and floods while restoring streams' aesthetic, recreational, and fish and wildlife values.

In Buena Vista Park, upper floodway slopes are gentle and grassed to achieve continuity of usable park land across the channel of small boulders at the base of the slopes.

The San Diego River is a large, vegetative lined channel, which was planted in a variety of species to support riparian wildlife while stabilizing the steep banks of the floodway.

References and Resources

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http://www.epa.gov/npdes/menuofbmps/poll_7.htm

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm



Design Objectives

- ☒ Maximize Infiltration
- ☒ Provide Retention
- ☒ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.



- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
 - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
 - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
 - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
 - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☒ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING



– DRAINS TO OCEAN” and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of “redevelopment”, then the requirements stated under “designing new installations” above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner’s association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.
- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

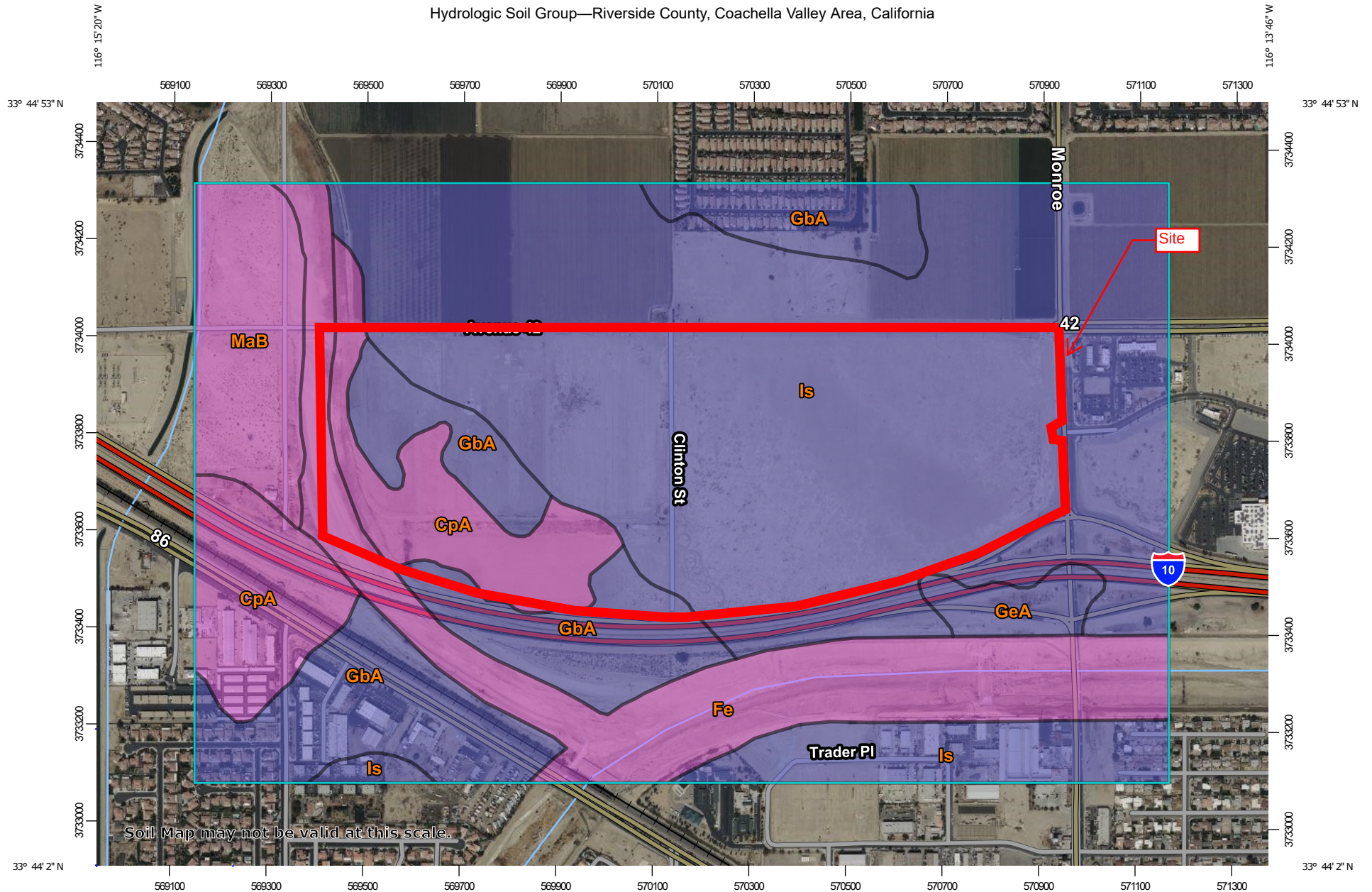
Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Appendix E

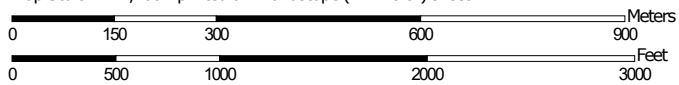
Soils Report

Hydrologic Soil Group—Riverside County, Coachella Valley Area, California



Soil Map may not be valid at this scale.

Map Scale: 1:11,100 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

8/17/2023
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Riverside County, Coachella Valley Area, California
 Survey Area Data: Version 14, Sep 1, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CpA	Coachella fine sand, 0 to 2 percent slopes	A	59.1	9.6%
Fe	Fluvents	A	81.0	13.1%
GbA	Gilman fine sandy loam, 0 to 2 percent slopes	B	98.9	16.0%
GeA	Gilman silt loam, 0 to 2 percent slopes	B	9.8	1.6%
Is	Indio very fine sandy loam	B	335.3	54.2%
MaB	Myoma fine sand, 0 to 5 percent slopes	A	34.9	5.6%
Totals for Area of Interest			618.9	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix F

Structural BMP and/or Retention Facility Sizing Calculations
and Design Details

Whitewater Watershed		Legend:		Required Entries
BMP Design Volume, V_{BMP} & Design Flow Rate, Q_{BMP} (Rev. 06-2014)				Calculated Cells
Company Name	MSA Consulting, Inc	Date	August 21, 2023	
Designed By	NM	County/City Case No.		
Company Project Number/Name	2760 - THE OASIS AT INDIO			
Drainage Area Number/Name	DA-A			
Enter the Area Tributary to this Feature (A_{TRIB})		$A_{TRIB} =$	78.280	acres
Determine the Impervious Area Ratio				
Determine the Impervious Area Within A_{TRIB} (A_{IMP})		$A_{IMP} =$	70.452	acres
Calculate the Impervious Area Ratio (I_F)		$I_F =$	0.90	
Calculate the Composite Runoff Coefficient, C for the BMP Tributary Area				
Use the following equation based on the WEF/ASCE Method				
$C_{BMP} = 0.858I_F^3 - 0.78I_F^2 + 0.774I_F + 0.04$		$C_{BMP} =$	0.73	
Determine Design Storage Volume, V_{BMP}				
Calculate V_U , the 80% Unit Storage Volume $V_U = 0.40 \times C_{BMP}$		$V_U =$	0.29	(in*ac)/ac
Calculate the design storage volume of the BMP, V_{BMP}				
$V_{BMP} (ft^3) = \frac{V_U (in\text{-}ac/ac) \times A_T (ac) \times 43,560 (ft^2/ac)}{12(in/ft)}$		$V_{BMP} =$	83,006	ft ³
BMP Design Flow Rate, Q_{BMP}				
$Q_{BMP} = C_{BMP} \times I \times A_{TRIB}$		$Q_{BMP} =$	11.43	ft ³ /s
I = Design Rainfall Intensity, 0.2 in/hr				
Notes:				

Whitewater Watershed		Legend:		Required Entries
BMP Design Volume, V_{BMP} & Design Flow Rate, Q_{BMP} (Rev. 06-2014)				Calculated Cells
Company Name	MSA Consulting, Inc	Date	August 21, 2023	
Designed By	NM	County/City Case No.		
Company Project Number/Name	2760 - THE OASIS AT INDIO			
Drainage Area Number/Name	DA-B			
Enter the Area Tributary to this Feature (A_{TRIB})		$A_{TRIB} =$	103.780	acres
Determine the Impervious Area Ratio				
Determine the Impervious Area Within A_{TRIB} (A_{IMP})		$A_{IMP} =$	93.402	acres
Calculate the Impervious Area Ratio (I_F)		$I_F =$	0.90	
Calculate the Composite Runoff Coefficient, C for the BMP Tributary Area				
Use the following equation based on the WEF/ASCE Method				
$C_{BMP} = 0.858I_F^3 - 0.78I_F^2 + 0.774I_F + 0.04$		$C_{BMP} =$	0.73	
Determine Design Storage Volume, V_{BMP}				
Calculate V_U , the 80% Unit Storage Volume $V_U = 0.40 \times C_{BMP}$		$V_U =$	0.29	(in*ac)/ac
Calculate the design storage volume of the BMP, V_{BMP}		$V_{BMP} =$	110,046	ft ³
$V_{BMP} \text{ (ft}^3\text{)} = \frac{V_U \text{ (in-ac/ac)} \times A_T \text{ (ac)} \times 43,560 \text{ (ft}^2\text{/ac)}}{12 \text{ (in/ft)}}$				
BMP Design Flow Rate, Q_{BMP}				
$Q_{BMP} = C_{BMP} \times I \times A_{TRIB}$		$Q_{BMP} =$	15.16	ft ³ /s
I = Design Rainfall Intensity, 0.2 in/hr				
Notes:				

BASIN VOLUME WORKSHEET

PROJECT THE OASIS AT INDIO
 JOB No. 2760
 BASIN DESIGNATION: Retention Basin

BASIN CHARACTERISTICS

CONTOUR ELEVATION	DEPTH		AREA		VOLUME		
	INCR (ft)	TOTAL (ft)	INCR (sf)	TOTAL (sf)	INCR (cuft)	TOTAL (cuft)	TOTAL (acre-ft)
503	0	0		39,635	0	0	0.00
504	1	1	33,098	72,733	55,353	55,353	1.27
505	1	2	34,705	107,438	89,523	144,877	3.33
506	1	3	36,119	143,557	125,062	269,939	6.20
507	1	4	37,533	181,090	161,961	431,899	9.92

WHERE:
$$V = \frac{1}{3} (E_1 - E_2) (A_1 + A_2 + \sqrt{A_1 A_2})$$

DYODS™
Design Your Own Detention System

CONTECH®
CMP DETENTION SYSTEMS

CONTECH®
CONSTRUCTION PRODUCTS INC.

For design assistance, drawings,
and pricing send completed worksheet to:
dyods@contech-cpi.com

Project Summary

Date:	8/21/2023	Enter Information in Blue Cells
Project Name:	THE OASIS AT INDIO	
City / County:	City of Indio / Riverside County	
State:	CA	
Designed By:	NM	
Company:	MSA Consulting, Inc.	
Telephone:	(760) 320-9811	

Corrugated Metal Pipe Calculator

Storage Volume Required (cf):	203,247	28.27 ft ² Pipe Area
Limiting Width (ft):	72.00	
Invert Depth Below Asphalt (ft):	10.00	
Solid or Perforated Pipe:	Perforated	
Shape Or Diameter (in):	72	
Number Of Headers:	0	
Spacing between Barrels (ft):	3.00	
Stone Width Around Perimeter of System (ft):	2	
Depth A: Porous Stone Above Pipe (in):	24	
Depth C: Porous Stone Below Pipe (in):	24	
Stone Porosity (0 to 40%):	40	

System Sizing

Pipe Storage:	107,075 cf	
Porous Stone Storage:	96,690 cf	
Total Storage Provided:	203,765 cf	100.3% Of Required Storage
Number of Barrels:	7 barrels	
Length per Barrel:	541.0 ft	
Length Per Header:	0.0 ft	
Rectangular Footprint (W x L):	64. ft x 545. ft	

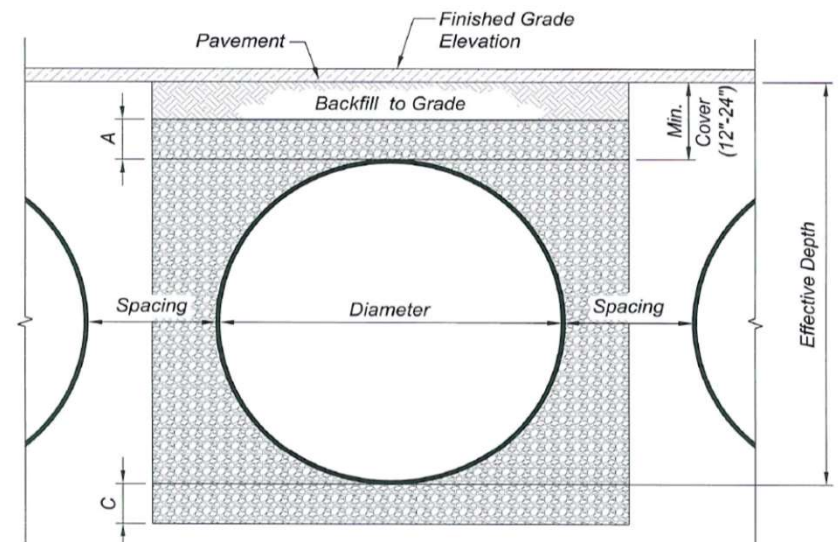
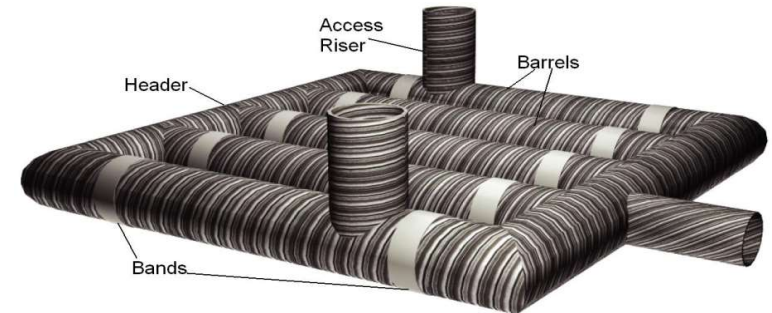
CONTECH Materials

Total CMP Footage:	3,787 ft
Approximate Total Pieces:	161 pcs
Approximate Coupling Bands:	154 bands
Approximate Truckloads:	81 trucks

Construction Quantities**

Total Excavation:	12919 cy
Porous Stone Backfill For Storage:	8953 cy stone
Backfill to Grade Excluding Stone:	0 cy fill

**Construction quantities are approximate and should be verified upon final design



System Layout

Barrel 12	0
Barrel 11	0
Barrel 10	0
Barrel 9	0
Barrel 8	0
Barrel 7	541
Barrel 6	541
Barrel 5	541
Barrel 4	541
Barrel 3	541
Barrel 2	541
Barrel 1	541

Barrel Footage (w/o headers)

BASIN VOLUME WORKSHEET

PROJECT THE OASIS AT INDIO
 JOB No. 2760
 BASIN DESIGNATION: Retention Basin

BASIN CHARACTERISTICS

CONTOUR ELEVATION	DEPTH		AREA		VOLUME		
	INCR (ft)	TOTAL (ft)	INCR (sf)	TOTAL (sf)	INCR (cuft)	TOTAL (cuft)	TOTAL (acre-ft)
506	0	0		242,519	0	0	0.00
507	1	1	23,571	266,090	254,214	254,214	5.84
508	1	2	23,903	289,993	277,956	532,169	12.22
509	1	3	24,201	314,194	302,012	834,182	19.15
510	1	4	24,513	338,707	326,373	1,160,555	26.64

WHERE:
$$V = \frac{1}{3} (E_1 - E_2) (A_1 + A_2 + \sqrt{A_1 A_2})$$

Appendix G

Agreements – CC&Rs, Covenant and Agreements, BMP Maintenance Agreements
and/or Other Mechanisms for ensuring ongoing Operation, Maintenance, Funding
and Transfer of Requirements for this project-specific WQMP

Appendix H

Phase 1 Environmental Site Assessment –
Summary of Site Remediation Conducted and Use Restrictions
(Not Available)

Appendix I

Project-Specific WQMP Summary Data Form

Project-Specific WQMP Summary Data Form

Applicant Information																	
Name and Title	David Um																
Company	B.H. Management, Inc.																
Phone	To Be Provided																
Email	frank@commercial-lighting.net																
Project Information																	
Project Name (as shown on project application/project-specific WQMP)	TTM No. 38799 - The Oasis at Indio																
Street Address	Southwest Corner of Avenue 42 and Monroe Street																
Nearest Cross Streets	Monroe Street																
Municipality (City or Unincorporated County)	Indio																
Zip Code	92203																
Tract Number(s) and/or Assessor Parcel Number(s)	APNs 610-020-001, 610-020-010, 610-020-012, 610-020-013, 610-020-021, 610-020-034, and 610-020-036																
Other (other information to help identify location of project)																	
Indicate type of project.	Priority Development Projects (Use an "X" in cell preceding project type): <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 5%;"></td> <td>SF hillside residence; impervious area $\geq$ 10,000 sq. ft.; Slope $\geq$ 25%</td> </tr> <tr> <td></td> <td>SF hillside residence; impervious area $\geq$ 10,000 sq. ft.; Slope $\geq$ 10% & erosive soils</td> </tr> <tr> <td style="text-align: center;">X</td> <td>Commercial or Industrial $\geq$ 100,000 sq. ft.</td> </tr> <tr> <td></td> <td>Automotive repair shop</td> </tr> <tr> <td></td> <td>Retail Gasoline Outlet disturbing > 5,000 sq. ft.</td> </tr> <tr> <td></td> <td>Restaurant disturbing > 5,000 sq. ft.</td> </tr> <tr> <td style="text-align: center;">X</td> <td>Home subdivision $\geq$ 10 housing units</td> </tr> <tr> <td></td> <td>Parking lot $\geq$ 5,000 sq. ft. or $\geq$ 25 parking spaces</td> </tr> </tbody> </table>		SF hillside residence; impervious area $\geq$ 10,000 sq. ft.; Slope $\geq$ 25%		SF hillside residence; impervious area $\geq$ 10,000 sq. ft.; Slope $\geq$ 10% & erosive soils	X	Commercial or Industrial $\geq$ 100,000 sq. ft.		Automotive repair shop		Retail Gasoline Outlet disturbing > 5,000 sq. ft.		Restaurant disturbing > 5,000 sq. ft.	X	Home subdivision $\geq$ 10 housing units		Parking lot $\geq$ 5,000 sq. ft. or $\geq$ 25 parking spaces
	SF hillside residence; impervious area $\geq$ 10,000 sq. ft.; Slope $\geq$ 25%																
	SF hillside residence; impervious area $\geq$ 10,000 sq. ft.; Slope $\geq$ 10% & erosive soils																
X	Commercial or Industrial $\geq$ 100,000 sq. ft.																
	Automotive repair shop																
	Retail Gasoline Outlet disturbing > 5,000 sq. ft.																
	Restaurant disturbing > 5,000 sq. ft.																
X	Home subdivision $\geq$ 10 housing units																
	Parking lot $\geq$ 5,000 sq. ft. or $\geq$ 25 parking spaces																
Date Project-Specific WQMP Submitted	September 1, 2023																
Size of Project Area (nearest 0.1 acre)	182.06																
Will the project replace more than 50% of the impervious surfaces on an existing developed site?	Yes																
Project Area managed with LID/Site Design BMPs (nearest 0.1 acre)	182.06																
Are Treatment Control BMPs required?	No																
Is the project subject to onsite retention by ordinance or policy?	Yes																
Did the project meet the 100% LID/Site Design Measurable Goal?	Yes																
Name of the entity that will implement, operate, and maintain the post-construction BMPs	B.H. Management, Inc.																
Contact Name	David Um																
Street or Mailing Address	11111 Santa Monica Boulevard, Suite 600																
City	Los Angeles, CA																
Zip Code	90049																
Phone	To Be Provided																
Space Below for Use by City/County Staff Only																	
Preceding Information Verified by (consistent with information in project-specific WQMP)	Name: Date:																
Date Project-Specific WQMP Approved:																	
Data Entered by	Name: Date:																
Other Comments																	