APPENDIX J

Water Quality Technical Analysis Report

DRAFT

Water Quality Technical Analysis Report for the Municipal Waterways Maintenance Plan City of San Diego, California PTS #616992

Prepared for:

The City of SAN DIEGO

Transportation & Storm Water Department

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NOVEMBER 2019

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LIST OF ACRONYMS

Acronym/ Abbreviation	Definition
BMI	benthic macroinvertebrate
BMP	best management practice
City	City of San Diego
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
ESA	Environmentally Sensitive Area
GI	green infrastructure
HPWQC	Highest Priority Water Quality Condition
HU	hydrologic unit
IBI	Index of Biological Integrity
ISWEBE	Water Quality Control Plan for Inland Surface Waters, Enclosed Bays and Estuaries of California
JRMP	Jurisdictional Runoff Management Plan
MS4	municipal separate storm sewer system
MWMP	Municipal Waterways Maintenance Plan
NPDES	National Pollutant Discharge Elimination System
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
RWQCB	Regional Water Quality Control Board
SIP	State Implementation Policy
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
WDR	waste discharge requirement
WMA	Watershed Management Area
WPCP	Water Pollution Control Plan
WQIP	Water Quality Improvement Plan

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EXECUTIVE SUMMARY

Under City of San Diego (City) Charter Section 26.1 and Council Policy 800-04, the City is responsible for maintaining adequate drainage facilities to remove storm water runoff in an efficient, economic, and environmentally and aesthetically acceptable manner for the protection of property and life. The City generally accepts responsibility for maintenance of public drainage facilities that are designed and constructed to City standards and located within a public street or drainage easement dedicated to the City. Although City Council Policy 700-44 (City of San Diego 1984) establishes the responsibility to protect private properties from flood damage to be with the property owners themselves, the City's Transportation & Storm Water Department is responsible for evaluating and conducting maintenance and repair of the public municipal storm water conveyance system throughout much of the City. The *Municipal Waterways Maintenance Plan* (MWMP) (City of San Diego 2019a) identifies specific activities, methods, and procedures that will guide ongoing maintenance and repair facilities. This *Water Quality Technical Analysis Report* was prepared to provide background water quality information, present a technical methodology to evaluate existing water quality conditions within the context of MWMP maintenance activities, and provide MWMP facility-specific results for water quality protections. Facility-specific results may be used to support environmental impacts analysis associated with MWMP.

The City drainage system includes a network of underground storm drains, culverts, inlets and outlets, detention basins, open flood control and natural channels, local creeks, bays, and beaches. MWMP facilities proposed for routine maintenance include 66 facility groups distributed throughout six Watershed Management Areas (WMAs) within City jurisdiction: San Dieguito River, Los Peñasquitos, Mission Bay, San Diego River, San Diego Bay, and Tijuana River.

A federal, state, and local regulatory framework provides water quality and other standards for the WMAs, City's drainage system, and MWMP facilities. Common water quality pollutants include sediment, pathogens, metals, organic compounds, nutrients, and trash. WMA water quality conditions are established by review of water body beneficial uses, existing water quality impairments and environmental conditions. A suite of water quality monitoring programs contribute to existing conditions information.

Water quality conditions were evaluated within the context of proposed MWMP maintenance activities to assess potential short- and long-term impacts to water quality. MWMP maintenance activities, including use of equipment, use of herbicides, management of flows, and permitted repair of infrastructure, may impact water quality and downstream receiving water conditions. In undisturbed and disturbed watershed systems, wetland vegetation, channel configuration, and biological conditions can contribute to water quality and downstream receiving water conditions.

Potential site-specific and watershed water quality impacts related to MWMP maintenance activities can vary based on existing hydrology, soil, and vegetation composition conditions.

The MWMP includes development of a facility-specific *Water Pollution Control Plan* prior to maintenance to address short-term water quality impacts. Facility-specific *Water Pollution Control Plans* will be tailored to identify pollution prevention and water quality best management practices to comply with City Storm Water Standards Manual (City of San Diego 2018a). The proposed MWMP maintenance areas incorporate avoidance and minimization by using hydrology-based data to minimize maintenance to only those areas where maintenance would provide a reduction in flood risk. The MWMP includes water quality measures that provide mitigation to address the temporal loss of wetlands and associated significant and unavoidable long-term water quality impacts resulting from facility maintenance until such time that compensatory biological mitigation is constructed.

The results of the facility-specific water quality evaluation presented in this *Water Quality Technical Analysis Report* can be used to support the evaluation of short- and long-term water quality impacts resulting from facility maintenance activities.

1 INTRODUCTION

1.1 BACKGROUND

Under City of San Diego (City) Charter Section 26.1 and Council Policy 800-04 (City of San Diego 2012), the City is responsible for maintaining adequate drainage facilities to remove storm water runoff in an efficient, economic, environmental, and aesthetically acceptable manner to protect property and life. The City generally accepts responsibility for maintenance of public drainage facilities that are designed and constructed to City standards and located within a public street or drainage easement dedicated to the City. Although City Council Policy 700-44 (City of San Diego 1984) establishes the responsibility to protect private properties from flood damage to be with the property owners themselves, the City's Transportation & Storm Water Department is responsible for evaluating and conducting maintenance and repair of the public municipal storm water conveyance system throughout much of the City.

The City maintained drainage facilities in accordance with the Master Storm Water System Maintenance Program, which is proposed to be replaced by the *City of San Diego Municipal Waterways Maintenance Plan* (MWMP). The MWMP was prepared to outline specific activities, methods, and procedures that will guide ongoing maintenance and repair of facilities. The MWMP provides a comprehensive approach to identify and regulate maintenance activities, primarily within open storm water facilities (i.e., those facilities located above ground and not within closed systems, such as pipes)

The objectives of the MWMP require the ability for the City's Transportation & Storm Water Department to be responsive to newly identified flood risks while also streamlining approvals for routine preventive maintenance that reduces flood risks. To accomplish this, the MWMP identifies the following:

1. A range of plan-wide activities that may occur throughout the storm water system where flood risks may arise and that would be conducted in accordance with a regulatory framework identified under the MWMP and associated permits.
2. A list of Facility Maintenance Plans (FMPs) that provide specific details and requirements for the majority of facilities that are likely to require routine maintenance and repair.

Together, these two components provide operational flexibility while also providing specific detailed analysis for the majority of anticipated maintenance and repair activities to streamline the review and approval process.

This *Water Quality Technical Analysis Report* was prepared to summarize water quality technical analysis that was performed to evaluate existing water quality conditions and provide a project-level analysis related to proposed maintenance activities for the list of MWMP facilities where FMPs are

proposed. The conclusions of this project-level analysis may also be used to analyze additional similar or related activities identified for a program-level analysis in the MWMP program area; however, such program-level analysis is not included in this technical report.

1.2 PURPOSE

The purpose of the water quality technical analyses was to answer the following technical questions:

- Would the MWMP adhere to the City's Storm Water Standards Manual (City of San Diego 2018a)?
- Would the MWMP otherwise substantially degrade water quality?

Potential impacts to water quality may occur if maintenance activities would result in a substantial or potentially substantial adverse change in the water quality conditions within the area affected by maintenance (City of San Diego 2016). Potential significant impacts to water quality may occur if maintenance activities would result in modification to existing drainage patterns, flow rates, or surface runoff such that downstream erosion and/or sedimentation result. Potential significant impacts to water quality may also occur if maintenance would result in increased pollutant discharge to receiving waters during or following construction. If performance of maintenance activities would forgo adherence to the City's Storm Water Standards Manual or waste discharge requirements (WDRs), and/or substantial degradation of water quality, potentially significant impacts to water quality may occur.

1.3 WATER QUALITY EVALUATION FRAMEWORK

The MWMP identifies facilities where maintenance is most likely to be required. The list of MWMP facilities evaluated was compiled from City prioritization analyses (City of San Diego 2018b), staff experience, recommendations resulting from analyses contained in the *Hydrology and Hydraulics Technical Report* (City of San Diego 2019b), and other available data and assessments. Sixty-six facility groups distributed throughout six Watershed Management Areas (WMAs) are proposed to undergo routine maintenance under the MWMP based on proposed FMPs for each facility group. These facilities are shown in Figure 1-1, Vicinity Map, and listed in Tables 1-1, 1-2, and 1-3. The six WMAs are San Dieguito River, Los Peñasquitos, Mission Bay, San Diego River, San Diego Bay, and Tijuana River. In the MWMP and other documentation, the San Diego Bay WMA is further divided into the Pueblo San Diego, Sweetwater, and Otay watersheds; however, because water quality regulatory documents align with WMAs, facilities are organized based on WMA in this document.

Background water quality data and information was assessed to evaluate the potential for maintenance-related activities to impact water quality conditions in MWMP facilities.

Data and information, including existing water quality conditions, beneficial uses, maintenance activity type/procedures, maintenance frequency, maintenance impact area, wetlands impact, previous wetlands mitigation/stream restoration, and location of compensatory wetlands mitigation/stream restoration, were assessed to identify potential water quality impacts and benefits. Within this framework, it is recognized that wetland vegetation, channel configuration, and biological conditions in undisturbed watershed areas can have positive impacts to water quality by spreading out and slowing down flows, providing shading, allowing for nutrient uptake, and reducing potential for anthropogenic sources of erosion and sediment transport. The relative importance of these factors may shift in disturbed watershed areas, in concrete-lined facilities with depositional sediment and emergent vegetation, and with increased flow velocities associated with precipitation events.

The MWMP applies a multi-faceted approach to address potential short-term and long-term water quality impacts related to maintenance activities.

For purposes of the MWMP, short-term impacts from maintenance activities would include those impacts that occur when maintenance is performed. Impacts that forgo adherence to the City's Storm Water Standards Manual (City of San Diego 2018a) may be significant (City of San Diego 2016). The City's Storm Water Standards Manual (City of San Diego 2018a) identify water pollution control activities based on current regulatory permit requirements. Accordingly, the MWMP includes a *Water Pollution Control Plan Guidance Document* to identify the type and efficacy of best management practices (BMPs) to be used during maintenance to minimize short-term impacts such that water quality standards are met.

The loss of wetland vegetation associated with maintenance is considered a potential long-term water quality impact (i.e., effects occur or extend after maintenance activities occur). If these potential long-term impacts degrade water quality conditions, they would be significant. To assess the potential for MWMP activities to degrade water quality conditions, the MWMP avoidance and minimization strategies and wetlands compensatory mitigation requirements are examined in terms of net effect on water quality. This approach also takes into consideration coordination between the MWMP and the City's other water quality management strategies (i.e., Watershed Master Plans and Water Quality Improvement Plans (WQIPs)).

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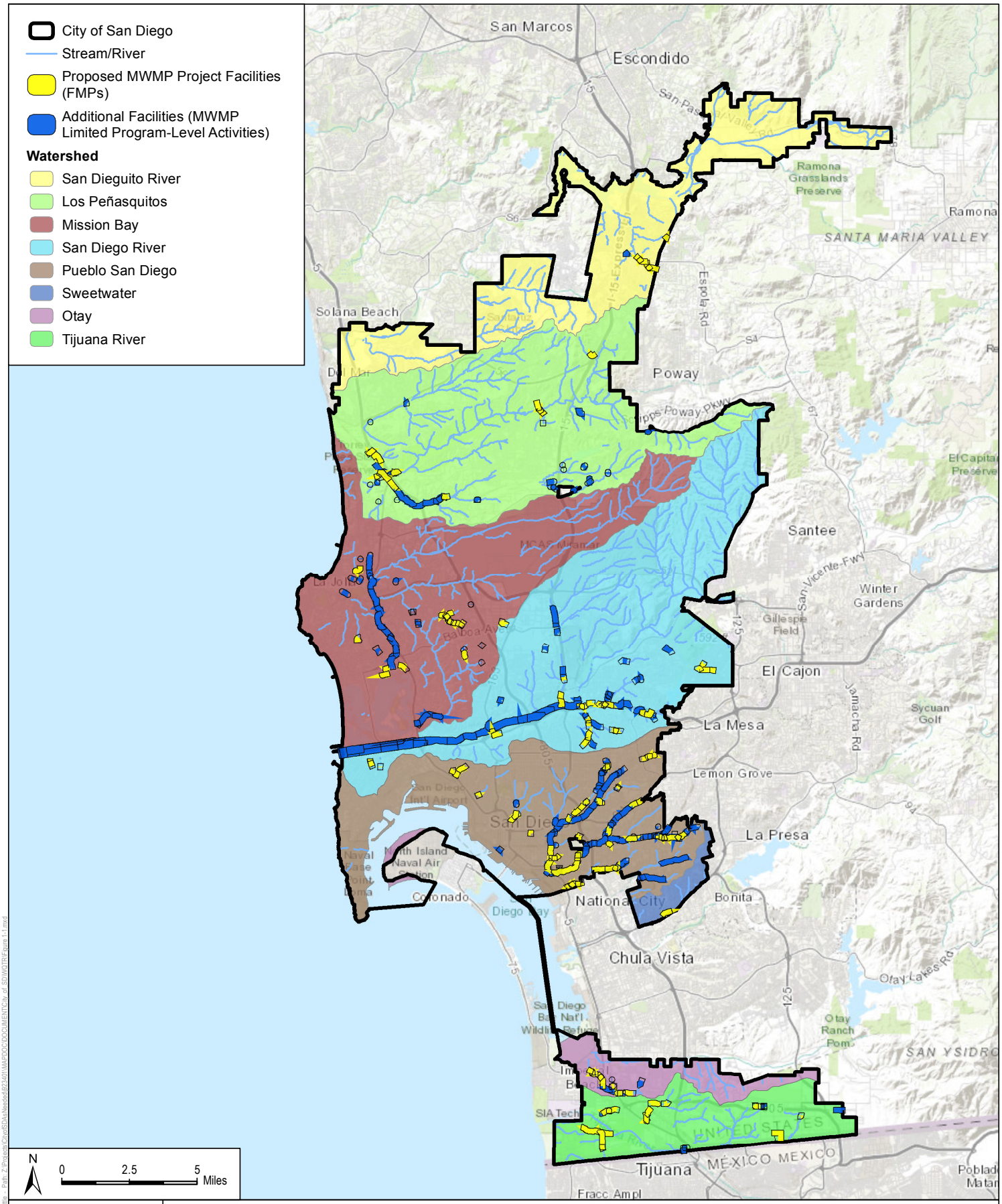

SOURCE: ESRI, 2017

DUDEK

The City of SAN DIEGO

Municipal Waterways Maintenance Plan

Water Quality Technical Analysis Report

Figure 1-1 - Vicinity Map

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Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
San Dieguito River Watershed								
1-04-030	Green Valley Creek – Pomerado	Pomerado	1	Concrete	—	N/A	1,785	1,785
1-04-033	Green Valley Creek – Pomerado	Pomerado	2	Concrete	—	N/A	2,456	2,456
Los Peñasquitos Watershed								
2-01-120	Peñasquitos Lagoon – Industrial	Industrial	1	Earthen	Yes – CCC	Adjacent	25	285
2-01-122	Peñasquitos Lagoon – Industrial	Industrial	2	Concrete	Yes – City	Partially Adjacent	650	650
2-01-130	Peñasquitos Lagoon – Tripp	Tripp	1	Concrete	Yes – City	N/A	1,835	1,835
2-01-200	Los Peñasquitos Canyon Creek – Black Mountain	Black Mountain	1	Earthen	—	Adjacent	952	952
2-01-210	Los Peñasquitos Canyon Creek – Black Mountain	Black Mountain	2	Earthen	—	Partially Within and Adjacent	959	959
2-03-000	Soledad Canyon Creek – Sorrento	Roselle	1	Earthen	Yes – City	N/A	215	1,554

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
2-03-002	Soledad Canyon Creek – Sorrento	Roselle	2	Concrete	Yes – City	N/A	2,314	2,314
2-03-012	Carroll Canyon Creek – Carroll	Carroll Canyon	1	Earthen and Concrete	—	Partially Within and Adjacent	184	241
2-03-100	Soledad Canyon Creek – Flintkote	Flintkote	1	Concrete	Yes – City	Partially Adjacent	992	992
2-03-150	Soledad Canyon Creek – Dunhill	Dunhill	1	Earthen	Yes – City	N/A	430	430
2-05-140	Chicarita Creek – Via San Marco	Via San Marco	1	Concrete	—	N/A	697	697
Mission Bay Watershed								
3-00-120	Torrey Pines – Torrey	Torrey Pines	1	Earthen	—	N/A	92	1,185
3-02-101	Mission Bay – MBHS	PB-Olney	1	Earthen	Yes – City	N/A	910	910
3-02-103	Mission Bay – MBHS	MBHS	1	Concrete	Yes – City	N/A	1,058	1,058
3-02-130	Mission Bay – Mission Bay Drive	Mission Bay Drive	1	Earthen	Yes – CCC	N/A	1,085	1,085
3-03-901	Miramar – Engineer	Engineer	1	Concrete	—	N/A	1,220	1,220

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
3-04-055	Tecolote Creek – Chateau	Chateau	1	Concrete	—	N/A	4,882	4,882
3-04-250	Tecolote Creek – Chateau	Chateau	2	Concrete	—	N/A	1,057	1,057
3-04-160	Tecolote Creek – Genesee	Genesee	1	Earthen	—	Partially Adjacent	767	767
San Diego River Watershed								
4-01-103	San Diego River – Nimitz	Nimitz	1	Earthen	—	N/A	116	116
4-01-105	San Diego River – Nimitz	Nimitz	2	Concrete	—	N/A	291	291
4-01-107	San Diego River – Nimitz	Nimitz	3	Earthen	—	N/A	476	476
4-01-120	San Diego River – Valeta	Valeta	1	Concrete	Yes – City	Adjacent	161	161
4-03-101	San Diego River – Camino del Rio	Camino del Arroyo	1	Concrete	—	N/A	642	642
4-03-103	San Diego River – Camino del Rio	Camino del Rio	1	Concrete	—	N/A	1,019	1,019
4-04-000	Murphy Canyon Creek – Stadium	Stadium	1	Earthen	—	Partially Adjacent	1,661	1,661
4-04-002	Murphy Canyon Creek – Stadium	Stadium	2	Concrete	—	N/A	207	207

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
4-04-006	Murphy Canyon Creek – Stadium	Murphy Canyon	1	Concrete	—	N/A	532	532
4-07-002	Alvarado Canyon Creek – Mission Gorge	Mission Gorge	1	Earthen and Concrete	—	N/A	718	864
4-07-004	Alvarado Canyon Creek – Mission Gorge	Mission Gorge	2	Concrete	—	N/A	521	521
4-07-009	Alvarado Canyon Creek – Mission Gorge	Mission Gorge	3	Earthen and Concrete	—	N/A	700	862
4-07-011	Alvarado Canyon Creek – Mission Gorge	Mission Gorge	4	Concrete	—	N/A	515	1,261
4-07-021	Alvarado Canyon Creek – Alvarado	Alvarado	1	Earthen and Concrete	—	Partially Within and Adjacent	1,102	1,102
4-07-023	Alvarado Canyon Creek – Alvarado	Alvarado	2	Concrete	—	Partially Within and Adjacent	1,192	1,192
4-07-250	Alvarado Canyon Creek – Alvarado	Alvarado	3	Concrete	—	Partially Adjacent	517	517

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
4-07-901	Murray Reservoir – Cowles Mountain	Cowles Mountain	2	Concrete	—	N/A	697	697
4-07-911	Murray Reservoir – Cowles Mountain	Cowles Mountain	1	Concrete	—	N/A	2,195	2,195
4-08-008	Norfolk Canyon Creek – Fairmount	Fairmount	1	Concrete	—	Partially Adjacent	248	248
4-08-011	Norfolk Canyon Creek – Fairmount	Fairmount	2	Concrete	—	Partially Within and Adjacent	575	575
4-08-014	Norfolk Canyon Creek – Fairmount	Fairmount	3	Earthen	—	Partially Within and Adjacent	29	820
4-08-017	Norfolk Canyon Creek – Fairmount	Fairmount	4	Concrete	—	Partially Within and Adjacent	1,250	1,250
4-08-105	Norfolk Canyon Creek – Fairmount	Baja	1	Earthen and Concrete	—	Partially Adjacent	1,369	1,369

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
Pueblo San Diego Watershed								
5-02-151	Washington Canyon Creek – Washington	Washington	1	Earthen	—	N/A	217	217
5-02-153	Washington Canyon Creek – Washington	Washington	2	Concrete	—	N/A	2,210	2,210
5-02-162	Mission Hill Canyon Creek – Titus	Titus	1	Earthen	—	Partially Within and Adjacent	39	207
5-03-011	Powerhouse Canyon Creek – Pershing	Pershing	1	Concrete	—	N/A	1,598	1,598
5-03-100	Powerhouse Canyon Creek – Pershing	Pershing	2	Concrete	—	N/A	437	437
5-03-901	San Diego Bay – 28th St	28th St	1	Earthen	—	N/A	67	67
5-04-004	Chollas Creek – National	National	1	Earthen and Concrete	Yes – City	N/A	816	1,976
5-04-006	Chollas Creek – National	National	1	Concrete	—	N/A	2,743	2,743

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
5-04-044	Chollas Creek – Rolando	Cartagena	1	Concrete	—	N/A	1,225	1,225
5-04-046	Chollas Creek – Rolando	Rolando	1	Concrete	—	N/A	374	374
5-04-048	Chollas Creek – Rolando	Rolando	2	Earthen	—	N/A	820	820
5-04-101	Chollas Creek– Martin	Martin	1	Earthen and Concrete	—	N/A	120	1,128
5-04-163	Chollas Creek – J St	J St	1	Earthen	—	N/A	15	404
5-04-220	Auburn Creek – Home	Home	1	Earthen	—	N/A	415	415
5-04-224	Auburn Creek – Home	Home	2	Earthen	—	N/A	160	920
5-04-227	Auburn Creek – Home	Home	3	Concrete	—	Partially Adjacent	369	369
5-04-231	Auburn Creek – Home	Home	5	Earthen and Concrete	—	Partially Adjacent	275	275
5-04-239	Auburn Creek – Wightman	Wightman	1	Earthen and Concrete	—	N/A	297	297

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
5-04-241	Auburn Creek – Wightman	Wightman	2	Earthen and Concrete	—	N/A	645	645
5-04-260	Chollas Creek – Megan	Megan	1	Concrete	—	Adjacent	849	849
5-04-262	Chollas Creek – Megan	Megan	2	Earthen	—	N/A	62	464
5-04-280	Chollas Creek – 54th St.	54th St	1	Concrete	—	N/A	264	264
5-05-006	South Chollas Creek – Southcrest	Alpha	1	Earthen and Concrete	—	N/A	1,007	5,024
5-05-008	South Chollas Creek – Southcrest	Ocean View	1	Earthen and Concrete	—	N/A	1,010	2,223
5-05-021	South Chollas Creek – Euclid	Euclid	2	Concrete	—	N/A	1,045	1,045
5-05-035	South Chollas Creek – Federal	Federal	1	Earthen and Concrete	—	Partially Adjacent	61	614
5-05-037	South Chollas Creek – Federal	Federal	2	Concrete	—	N/A	1,329	1,329

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
5-05-205	South Chollas Creek Encanto Branch – Castana	Castana	1	Earthen and Concrete	—	N/A	66	260
5-05-306	South Chollas Creek Encanto Branch – Imperial	Imperial	2	Concrete	—	N/A	1,074	1,074
5-05-603	South Chollas Creek Encanto Branch – Jamacha	Jamacha	1	Earthen	—	N/A	703	5,141
5-06-005	Paleta Creek – Cottonwood	Cottonwood	1	Concrete	—	N/A	501	500
5-06-008	Paleta Creek – Cottonwood	Cottonwood	2	Concrete	—	N/A	1,899	1,899
5-06-020	Paleta Creek – Solola	Solola	1	Concrete	—	N/A	2,625	2,625
5-06-023	Paleta Creek – Solola	Solola	2	Concrete	—	N/A	1,907	1,907
Sweetwater Watershed								
5-11-003	Sweetwater River – Parkside	Parkside	1	Concrete	—	N/A	1,197	1,197

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
Otay Watershed								
5-22-008	Nestor Creek – Nestor	Cedar	1	Earthen	Yes – City	N/A	65	427
5-22-010	Nestor Creek – Nestor	Cedar	2	Concrete	Yes – City	N/A	560	560
5-22-013	Nestor Creek – Nestor	Dahlia	1	Concrete	—	N/A	622	622
5-22-016	Nestor Creek – Nestor	Cerissa	1	Earthen	—	N/A	1,467	2,041
5-22-023	Nestor Creek – Nestor	Grove	1	Earthen and Concrete	—	N/A	1,039	1,039
5-22-028	Nestor Creek – Nestor	30th St	1	Earthen and Concrete	—	N/A	1,183	1,183
5-22-110	Nestor Creek – Outer	Outer	1	Earthen	—	N/A	385	385
5-22-112	Nestor Creek – Outer	Outer	2	Concrete	—	N/A	176	176
Tijuana River Watershed								
6-01-020	Tijuana River – Pilot & Smugglers	Pilot Channel	1	Earthen	Yes – City	Within	5,550	5,550

Table 1-1
Proposed Channel and Ditch FMPs by Watershed, Substrate, and Coastal Zone

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
6-01-100	Tijuana River – Pilot & Smugglers	Smuggler's Gulch	1	Earthen	Yes – City	Within	3,026	3,875
6-02-118	Tijuana River – Tocayo	Tocayo	2	Concrete	Yes – City	N/A	2,498	2,498
6-03-135	Tijuana River – Smythe	Via Encantadoras	1	Earthen	Yes – City	N/A	120	120
6-03-138	Tijuana River – Smythe	Via Encantadoras	2	Concrete	—	N/A	955	955
6-03-143	Tijuana River – Smythe	Via Encantadoras	3	Earthen and Concrete	—	N/A	886	886
6-03-147	Tijuana River – Smythe	Smythe	1	Earthen	—	N/A	1,355	1,355
6-03-150	Tijuana River – Smythe	Via de la Bandola	1	Concrete	—	N/A	716	716
6-06-011	Tijuana River – La Media	La Media	1	Earthen	—	Adjacent	5	223

FMP = Facility Maintenance Plan; City = City of San Diego; CCC = California Coastal Commission; N/A = not applicable; MBHS = Mission Bay High School; PB = Pacific Beach

[1] Linear feet is approximate based on measurements made in GIS.

Table 1-2
Basin Facility Maintenance Plans by Watershed

Facility Number	Watershed	Facility Group Name	Segment Name	Segment Number	Coastal Zone – Permit Authority	Multi-Habitat Planning Area	Acreage/ Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
1-04-200	San Dieguito River	Green Valley Creek – Paseo del Verano	Paseo del Verano	1	—	N/A	0.29 acres	203
2-01-900	Los Peñasquitos	Los Peñasquitos Canyon Creek – 5–805 Basin	5-805 Fwy	1	Yes – CCC	Partially Within and Adjacent	1.44 acres	744
3-00-150	Mission Bay	Alta La Jolla – Vickie	Vickie	1	—	Partially Adjacent	1.13 acres	234
5-02-140	Pueblo San Diego	Maple Canyon Creek – Maple	Maple	1	—	N/A	0.12 acres	90
6-04-251	Tijuana River	Spring Canyon Creek – Cactus	Cactus	1	—	N/A	229 linear feet	229
6-04-253			Cactus	2	—	N/A	923 linear feet	923
6-05-110		Tijuana River – Siempre Viva	Siempre Viva	1	—	N/A	2,711 linear feet	2,711

Notes: All basins are earthen-bottom except Paseo del Verano.
CCC = California Coastal Commission; N/A = not applicable
[1] Acreage/Linear feet is approximate based on measurements made in GIS.

Table 1-3
Proposed Structure Facility Maintenance Plan by Watershed

IAMFLOC	Watershed	Facility Group Name	Coastal Zone – Permit Authority	Multi-Habitat Planning Area
HW04220	Los Peñasquitos	10405 Sorrento Valley Road	Yes – City	N/A
OT03537	San Diego River	1331 Washington	—	N/A
IN10399		1277 Camino Del Rio South	—	Partially Adjacent
OT05573		5505 Friars and Colusa	—	Partially Within and Adjacent
OT03321		1660 Hotel Circle North	—	N/A
HW02440		901 Hotel Circle South	—	Partially Within and Adjacent
HW02437		2087 Hotel Circle South	—	Partially Within and Adjacent
OT03694	Pueblo San Diego	3644 Roselawn	—	N/A
HW04013		4202 J Street	—	N/A
OT054671		1206 Goodyear	—	N/A

IAMFLOC = Infrastructure Asset Management Functional Location; City = City of San Diego; N/A = not applicable

1.4 SUMMARY OF MWMP MAINTENANCE ACTIVITIES

As required by the City Charter Section 26.1, and City Council Policy 800-04, the City is responsible for maintaining and repairing the storm water system throughout its jurisdiction. The type of MWMP maintenance activities considered for each facility group segment was based on the hydrology and hydraulics analyses contained in the *Hydrology and Hydraulics Technical Report* (City of San Diego 2019b), the biological resources present, and other factors, as described in Chapter 3 of the MWMP (City of San Diego 2019a). Proposed maintenance activities generally include vegetation management, sediment and debris removal, drain structure clearing, and invasive plant species management. Maintenance activities may also include repair activities such as concrete repair and bank repair. The specific hydrology and hydraulics maintenance recommendations for each facility group and segment are provided in Attachment A of the *Hydrology and Hydraulics Technical Report* (City of San Diego 2019b). Maintenance recommendations may be modified in consideration of environmental constraints such as biological and cultural resources, which may exclude or limit the recommended maintenance.

1.5 REPORT ORGANIZATION

This report is organized as follows:

- Chapter 1 provides the *Water Quality Technical Analysis Report* background and purpose, introduces the water quality evaluation framework, and summarizes the MWMP maintenance activity types.
- Chapter 2 provides background information regarding the City's storm water system, water quality regulatory framework, summary of pollutants in storm water runoff, and existing water quality conditions of MWMP facilities.
- Chapter 3 describes the technical methodology used to evaluate existing water quality conditions within the context of MWMP maintenance activities.
- Chapter 4 summarizes the results of the water quality evaluation performed for each facility group.
- Chapter 5 describes the use of the water quality evaluation results to support the environmental impacts analysis for the MWMP.
- Chapter 6 presents the references used in this report.
- Appendix A provides the Water Quality Summary Tables.
- Appendix B is Summaries of Watershed Management Area-Specific Beneficial Uses.

2 WATER QUALITY BACKGROUND

This chapter provides background information regarding the City's storm water system, the water quality regulatory framework, pollutants in storm water runoff, and existing water quality conditions of MWMP facilities.

2.1 CITY STORM WATER SYSTEM AND CHANNELS

Runoff from City streets, rooftops, driveways, parking lots, and other impervious areas is conveyed by a public/private drainage system. The primary function of the City owned and operated drainage system is to safely convey runoff to reduce risk to life and property from potential flooding. The drainage system includes a network of underground storm drains, culverts, inlets and outlets, detention basins, open flood control and natural channels, local creeks, bays, and beaches. There are approximately 550 miles of streams in the City (SANDAG 2018). The total length of the portions for which maintenance is proposed per the MWMP is approximately 18 miles. Since the City's storm water conveyance system is separate from the sanitary sewer system, the drainage system is referred to in storm water regulations as the municipal separate storm sewer system (MS4).

2.2 REGULATORY FRAMEWORK

The City is subject to federal, state, and local/regional water quality requirements. Various pertinent federal actions and statewide plans, permits, and orders, as well as local/regional plans, permits, standards, and other regulatory actions, are applicable to MWMP activities (Exhibit 1). The following sections summarize important components of the water quality regulatory setting for the City.

Additional information related to the water quality regulatory setting for the MWMP is contained in the Environmental Impact Report, *Hydrology and Hydraulics Technical Report* (City of San Diego 2019b), and *Biological Resources Technical Report* (City of San Diego 2019c).

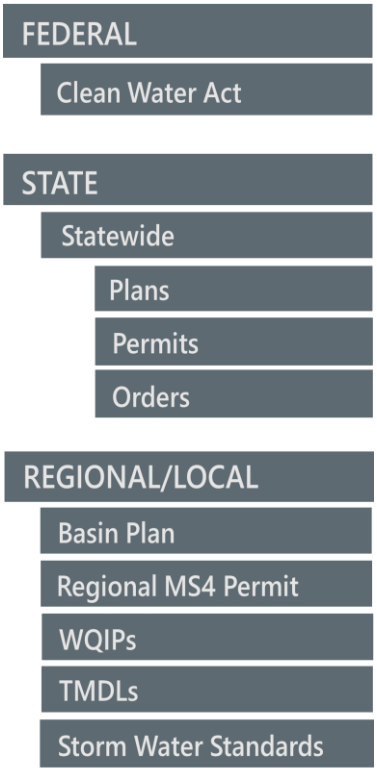

Exhibit 1. Various Federal, State, and Regional/Local Water Quality Requirements Applicable to the MWMP

Federal

This section describes applicable federal water quality regulations.

Clean Water Act

Increasing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act (CWA). The CWA established basic guidelines for regulating discharges of pollutants into the waters of the United States. The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the CWA.

- **Section 401.** Section 401 of the CWA requires an applicant for a federal permit, such as for construction or operation of a facility that may result in the discharge of a pollutant, to obtain certification of those activities from the state where the discharge originates. This process is known as the Water Quality Certification (401 Certification) for a project. For projects in San Diego County, the San Diego Regional Water Quality Control Board (RWQCB) issues Section 401 permits.
- **Section 402.** Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to control water pollution by regulating point sources that discharge pollutants into waters of the United States. Pursuant to CWA Section 402(p), storm water permits are required for discharges from an MS4 serving a population of 100,000 or more. The State Water Resources Control Board (SWRCB) uses its Municipal Storm Water Program to manage the Phase I Permit Program (serving municipalities of 100,000 people or more), the Phase II Permit Program (for municipalities with less than 100,000 people), and the Statewide Storm Water Permit for the California Department of Transportation. The SWRCB and RWQCBs implement and enforce the Municipal Storm Water Program. Specific information related to NPDES permits applicable to the MWMP is presented below.
- **Section 404.** Section 404 of the CWA established a permitting program to regulate the discharge of dredged or fill material into waters of the United States. Waters of the United States include wetlands adjacent to national waters. This permitting program is administered by the U.S. Army Corps of Engineers and is enforced by the U.S. Environmental Protection Agency (EPA).
- **Section 303(d).** Under Section 303(d) of the CWA, the SWRCB is required to develop a list of water quality limited segments for jurisdictional waters of the United States. The RWQCBs are responsible for establishing the list of water quality limited segments and for developing

plans, referred to as Total Maximum Daily Loads (TMDLs), to improve the water quality of water bodies included on the 303(d) list. The 2014 303(d) List of Water Quality Limited Segments is the most recent 303(d) list approved by EPA (SWRCB 2017). The list includes pollutants causing impairment to receiving waters or, in some cases, the condition leading to impairment. Alternative pathways to traditional TMDLs may be considered by the RWQCB for pollutants listed on the 303(d) list. The 303(d) listings of water bodies in the MWMP program area are described in Section 2.4 of this report.

State

This section describes applicable state water quality regulations.

Porter–Cologne Water Quality Control Act

Water quality regulation in California pre-dates the CWA by more than two decades. California's nine RWQCBs were established by the Dickey Water Pollution Control Act of 1949. The Porter–Cologne Water Quality Control Act (Porter–Cologne Act, Division 7 of the California Water Code) was implemented in 1969, and (as amended) remains the basic water quality control law for California. The Porter–Cologne Act established the SWRCB and created a regulatory program to protect water quality and beneficial uses of the state's waters. After the subsequent establishment of the EPA and implementation of the CWA, EPA delegated authority to the SWRCB and RWQCBs to implement and enforce the CWA and state-adopted Water Quality Control Plans. Most of San Diego County falls within the jurisdiction of the San Diego RWQCB (Region 9). Each RWQCB is responsible for water quality control planning within its region, including adopting and implementing a Water Quality Control Plan (i.e., Basin Plan).

Waste Discharge Requirements

Actions that involve, or are expected to involve, discharge of waste are subject to water quality certification under Section 401 of the CWA (e.g., if a federal permit is being sought or granted) and/or WDRs under the Porter–Cologne Act. Chapter 4, Article 4 of the Porter–Cologne Act (California Water Code, Sections 13260–13276) states that persons discharging or proposing to discharge waste that could affect the quality of waters of the state (other than into a community sewer system) must file a report of waste discharge with the applicable RWQCB. For discharges to surface water (i.e., waters of the United States), an NPDES permit is required, which is issued by the RWQCB pursuant to authority delegated by the EPA. The RWQCB regulates discharges to state waters through the issuance of WDRs, including discharges to land (e.g., spoils disposal and storage), erosion from soil disturbance, and discharges to isolated (non-federal) wetlands. WDRs, which are issued exclusively under state law, typically include many of the same BMPs and pollution control

technologies as those required by NPDES-derived permits. Further, the WDR application process is generally the same as for CWA Section 401 water quality certification, although in the case of WDRs, it does not matter whether the particular project is subject to federal regulation.

Due to the broad scope of state and federal water quality regulations, the SWRCB and RWQCBs developed general WDRs specific to activities that involve similar types of discharges and, thus, also require similar types of pollution control. This is the focus of the various storm water programs administered by the SWRCB and RWQCB, such as the construction storm water program, the industrial storm water program, and the municipal storm water program. RWQCBs, including the San Diego RWQCB, also have the authority to implement general permits to multiple permittees, and to provide for waivers of WDRs. These are as follows:

- **San Diego Region MS4 Permit (RWQCB Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100):** The San Diego Region MS4 Permit, or MS4 Permit, grants the San Diego RWQCB authority to regulate discharges from Phase I MS4s. The primary purpose of the MS4 Permit is to establish the conditions under which pollutants can be discharged from the storm drain system to local streams, coastal lagoons, and the ocean; thus, protecting local water bodies from pollutants without being treated. The MS4 Permit implements requirements of the CWA and federal NPDES storm water regulations. Under this permit, each municipality has the following responsibilities:
    - Identify major outlets and pollutant loadings;
    - Detect and eliminate all non-storm-water discharges to the system, except as specifically exempted;
    - Prevent and reduce pollutants in runoff from industrial, commercial, and residential areas through the implementation of BMPs;
    - Control storm water discharges from new development and redevelopment;
    - Inspect industrial, commercial, and construction activities;
    - Provide pertinent education and promote public reporting of pollution; and
    - Monitor discharges and impacts on receiving waters.

  BMP design practices and associated standards are incorporated into the City of San Diego Storm Water Standards Manual (City of San Diego 2018a), which is periodically updated to reflect the currently adopted MS4 Permit. Per the MS4 Permit, the City also developed a jurisdictional

runoff management plan, and participated in development of multi-jurisdictional WQIPs, which are required for each WMA.

- **Statewide Construction General Permit (SWRCB Order No. 2009-0009-DWQ, as amended):** For storm water discharges associated with construction activity in California, the SWRCB has adopted the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) to avoid and minimize water quality impacts attributable to such activities. The Construction General Permit applies to all projects in which construction activity disturbs 1 acre or more of soil.

  Although a *Storm Water Pollution Prevention Plan* would not be required for routine maintenance activities, BMPs would be implemented as a part of the program. EPA defines BMPs as "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the United States." BMPs include "treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage" (40 CFR 122.2).
- **Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications (SWRCB Order No. 2013-0002-DWQ, General Permit No. CAG990005):** The discharge of algaecides and aquatic herbicides and their residues to surface waters for algae and aquatic weed control throughout California may pose a threat to existing and potential beneficial uses of waters of the United States if not properly controlled and regulated. This General Permit regulates the discharge of aquatic pesticides used for algae and aquatic weed control to waters of the United States. This General Permit covers the point source discharge to waters of the United States of residues resulting from pesticide/herbicide application. The General Permit does not cover agricultural storm water discharges or return flows from irrigated agriculture because these discharges are not defined as point sources and do not require coverage under an NPDES permit. This General Permit also does not cover other indirect or nonpoint source discharges from applications of algaecides and aquatic herbicides, including discharges of pesticides to land that may be conveyed in storm water or irrigation runoff.

Resource Agency Permit Requirements

California Fish and Game Code Section 1602, Lake and Streambed Alteration Program, requires an entity to notify the California Department of Fish and Wildlife prior to commencing any activity that may do one or more of the following: substantially divert or obstruct the natural flow of any river, stream, or lake;

substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or deposit debris, waste, or other materials that could pass into any river, stream, or lake. The RWQCB administers the 401 Water Quality Certification and Wetlands Program, which regulates discharges of fill and dredged material under CWA Section 401 and the Porter-Cologne Water Quality Control Act.

Water Quality Control Plan for Ocean Waters of California (Ocean Plan)

The SWRCB has established objectives for the protection of marine water quality in its *Water Quality Control Plan for the Ocean Waters of California* (Ocean Plan). The Ocean Plan does the following (SWRCB 2012a):

- Establishes receiving water quality standards and discharge prohibitions to protect designated beneficial uses of ocean waters;
- Establishes technology-based effluent standards applicable to all discharges of wastewater to the ocean; and
- Establishes implementation policies and procedures for point source and non-point source discharges to ensure compliance with the water quality standards and to protect beneficial uses.

Ocean Plan requirements are implemented through SWRCB or RWQCB activities, such as the issuance of NPDES permits or other relevant regulatory approaches to ensure achievement of water quality standards (e.g., beneficial uses, water quality criteria or objectives to protect the beneficial uses, and state and federal anti-degradation policies).

Inland Surface Waters, Enclosed Bays, and Estuaries Plan

The *Water Quality Control Plan for Inland Surface Waters, Enclosed Bays and Estuaries of California* (ISWEBE) establishes provisions for water quality and sediment quality that apply to all inland surface waters, enclosed bays, and estuaries of the state, including waters of the United States and surface waters of the state. The provisions contained in the ISWEBE do not apply to ocean waters in California, such as Monterey Bay or Santa Monica Bay. Similar to the Ocean Plan, the requirements of the ISWEBE are implemented through the issuance of NPDES permits or other regulatory approaches, with the goal being to achieve water quality standards.

Statewide Trash Amendments

In 2015, the SWRCB adopted, and the Office of Administrative Law approved, the *Amendment to the Water Quality Control Plan for Ocean Waters of California to Control Trash and Part 1 Trash Provision of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries*. Collectively, these documents are referred to as the "Trash Amendments" and are intended to provide statewide consistency in governing trash control (SWRCB 2015).

The Trash Amendments provide a framework for implementing land-use-based compliance approaches into the respective NPDES storm water discharge permits; WDRs; and waivers of WDRs for municipal systems, the California Department of Transportation, industrial sites, and construction sites. The land-use-based approach targets high-trash-generating areas, such as high-density residential, industrial, commercial, mixed urban, and public transportation land uses (Priority Land Uses) and includes two compliance tracks. Under Track 1, permittees can elect to install a network of full-capture systems to remove trash conveyed via the MS4 from priority land-use areas. Track 2 allows permittees to use any combination of controls (structural and/or institutional) anywhere in their jurisdiction, as long as it can be demonstrated that the system performs as well as Track 1.

The City submitted a *Track 2 Implementation Plan* to the RWQCB on December 3, 2018. The Track 2 approach includes the following:

- Phased and adaptive installation of full capture systems in Priority Land Use areas in targeted Watershed Management Areas (WMAs);
- Implementation of enhanced WQIP programs (i.e., catch basin cleaning and street sweeping); and
- Implementation of additional institutional (i.e., nonstructural) programs and policies designed to reduce and control trash throughout the City (e.g., cleanup events, ordinances, and channel cleaning programs).

Requirements of the Trash Amendments are expected to be implemented through reissuance of the San Diego Region MS4 Permit. The Trash Amendments require full compliance with the trash discharge prohibition within 10 years of the effective date of the first implementing permit, or 15 years from the effective date of the Trash Amendments (i.e., December 2, 2030).

California Toxics Rule and State Implementation Policy

In 2000, the EPA promulgated statewide numerical water quality standards for toxic constituents that apply to California's inland surface waters, enclosed bays, and estuaries (California Toxics Rule, 40 CFR 131.38). The Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California (State Implementation Policy, or SIP) was adopted by the SWRCB on March 2, 2000, and amended in February 2005. The SIP, as amended:

- Establishes a standardized approach for permitting discharges of priority toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency.

- Applies to discharges of priority toxic pollutants into inland surface waters, enclosed bays, and estuaries of California, subject to regulation under the state Porter-Cologne Act (California Water Code, Division 7) and the federal CWA.
- Implements priority pollutant criteria (federally established through the California Toxic Rule) through NPDES permits as required by the CWA, Section 402, for point-source discharges to surface waters.

The requirements in the SIP are implemented through SWRCB or RWQCB activities, such as the issuance of NPDES permits or other relevant regulatory approaches, to ensure achievement of water quality standards (i.e., water quality criteria or objectives, the beneficial uses being protected, and corresponding state and federal anti-degradation policies).

California Coastal Act

The California Coastal Act (1976) is the primary law governing the California Coastal Commission. The California Coastal Commission was created in 1972 following implementation of the California Coastal Zone Conservation Act (Proposition 20), a temporary measure passed by voters. One of the main goals of the California Coastal Act is to "protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources." In addition, the California Coastal Act encouraged local governments to create Local Coastal Programs and locally manage conservation of coastal resources. The MWMP program area is affected by the California Coastal Act provisions, including Article 4, which involves protection of the marine environment, including water quality issues, and Article 5, which includes protections for environmentally sensitive habitat.

Regional/Local

This section describes applicable local water quality regulations.

Water Quality Control Plan for the San Diego Basin

The federal CWA, NPDES program, California Water Code, and Porter–Cologne Act require that RWQCBs adopt a Water Quality Control Plan to guide and coordinate the management of water quality in the region. The Water Quality Control Plan for the San Diego Basin (Basin Plan) designates beneficial uses of surface water and groundwater within each watershed of the San Diego Region; establishes water quality objectives to protect the designated beneficial uses; and describes an implementation program to maintain the designated beneficial uses and water quality objectives, and monitoring programs to assess the effectiveness of the Basin Plan. Beneficial uses are defined as "the uses of water necessary for

the survival of well-being of man, plants, and wildlife." These uses of water serve to promote economic, social, and environmental goals (RWQCB 2016).

The Basin Plan was adopted by the RWQCB in 1994, and was most recently updated in 2016. Surface water quality objectives established within the Basin Plan have been approved by the EPA as federal water quality standards that are subject to the protections and enforcement provisions established under the CWA.

Water Quality Improvement Plans

The Regional MS4 Permit required the development and implementation of WQIPs for each WMA in the region. In accordance with the Regional MS4 Permit, WQIPs were collaboratively prepared by the Copermittees with responsibility for storm water management within each WMA. The WQIP development process involved assessing priority water quality conditions, identifying the Highest Priority Water Quality Conditions (HPWQCs), identifying water quality numeric goals and schedules for achieving the goals, selecting water quality improvement strategies to address the sources of pollutants contributing to the HPWQC, developing a monitoring and assessment program, and developing an adaptive management process. The City has jurisdiction in six WMAs and was involved in the development of WQIPs for each of these WMAs (Responsible Agencies San Dieguito WMA 2015; Responsible Agencies Los Peñasquitos WMA 2015; Responsible Agencies Mission Bay WMA 2016; Responsible Agencies San Diego River WMA 2016; Responsible Agencies San Diego Bay WMA 2016; Responsible Agencies Tijuana River WMA 2016). Summary information from the WQIPs is contained in Section 2.4 and Appendix A of this report.

Jurisdictional Runoff Management Plan

The *Jurisdictional Runoff Management Plan* (JRMP) (City of San Diego 2018c) is the City's approach to improving water quality in its rivers, bays, lakes, and ocean through reducing discharges of pollutants to the MS4. The JRMP describes the programs and activities the City performs to improve water quality, such as performing routine street sweeping, storm water compliance inspections of businesses, and storm drain maintenance, and identifying and eliminating illicit discharge. Additionally, the storm water BMP requirements for new development, existing development (i.e., industrial, commercial, municipal, and residential land uses), and construction sites are incorporated in the JRMP. Some examples of BMPs include covering potential pollutant sources to prevent contact with rain, employing erosion reduction techniques at construction sites, adjusting sprinklers to eliminate irrigation runoff, sweeping parking lots, and building green infrastructure like planters that capture and treat runoff along streets.

Planned WQIP strategies have been incorporated in the City's JRMP to ensure that the appropriate activity or program includes all planned strategies listed in the City's WQIPs. The strategies listed in the WQIP are necessary to further improve water quality in the region to comply with more stringent regulations, such as TMDLs and Special Protections for Areas of Special Biological Significance, which are also required by the MS4 Permit.

The MWMP would operate under Section 7.3.13 of the JRMP (Storm Drain Conveyance System Operations and Maintenance) to provide an organized approach for maintaining the City's storm water conveyance system. Channel segments may require periodic maintenance to alleviate flooding concerns, threats to public and private property, and public safety may be necessary. BMP requirements in the JRMP and the City of San Diego Storm Water Standards Manual (City of San Diego 2018a) apply to storm water conveyance system maintenance.

Total Maximum Daily Loads

The TMDL approach provides a framework for evaluating pollution control efforts and for coordinating among federal, state, and local efforts to meet water quality standards. TMDLs are first issued as resolutions by the RWQCB, and are subsequently approved by the SWRCB and EPA. Approved TMDLs are then adopted into the applicable Basin Plan and incorporated into MS4 permits, including the Regional MS4 Permit.

City of San Diego Storm Water Standards Manual

Storm water BMP standards for City projects are outlined in the City's Storm Water Standards Manual (City of San Diego 2018a). The Storm Water Standards Manual constitutes the City's implementation of the Regional MS4 Permit and Storm Water Management and Discharge Control Ordinance (San Diego Municipal Code Section 43.0301 et seq.). Specific requirements for implementing BMPs vary based on the project type and amount of impervious surface proposed.

The City's Storm Water Requirements Applicability Checklist (Form DS-560) is used to determine whether a project is a priority development project; a standard development project; or a project exempt from permanent, post-construction storm water BMP requirements (City of San Diego 2018a). Post-construction BMP requirements in the Storm Water Standards Manual and the Regional MS4 Permit apply to new development or significant redevelopment projects that exceed size thresholds and/or fit under specific use or location categories. The size threshold is typically the amount of impervious area added and/or replaced. Additional criteria require post-construction BMPs when a project results in disturbance of 1 or more acres of land and is expected to generate pollutants post-construction (even if there is no additional or replacement of impervious area). The proposed channel maintenance activities are not anticipated to add impervious areas and/or

expected to generate pollutants post-construction, so the post-construction BMP requirements in the Storm Water Standards Manual do not apply.

The Storm Water Standards Manual contains minimum requirements for implementing construction-phase storm water BMPs, which would apply to maintenance activities at MWMP facilities (City of San Diego 2018a). Minimum construction-phase-related BMPs, which all public and private development projects must implement, are required by the Storm Water Standards Manual regardless of whether they require coverage under the state's Construction General Permit (SWRCB 2012b; Storm Water Standards Manual Part 2). Proposed maintenance activities to be conducted for the MWMP are not covered under the Construction General Permit, since these activities consist of "routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility" (SWRCB 2012b). However, maintenance activities to be conducted for the MWMP are subject to City-specific requirements for construction site pollution prevention and runoff management. For projects not subject to the Construction General Permit, the City's Storm Water Standards Manual requires development of a *Water Pollution Control Plan* (WPCP), which outlines the BMPs and pollution prevention measures that would be implemented for that project (City of San Diego 2018a; Storm Water Standards Manual Part 2 – Section 4.2). Typical WPCP BMPs include erosion controls, sediment controls, non-storm-water discharge prevention, materials and waste management, particulate and dust control, and final stabilization.

A facility-specific WPCP would be developed for each MWMP facility prior to maintenance. A MWMP-focused WPCP working document has been developed by the City to tailor facility-specific water quality conditions and BMP requirements, as applicable for the actual maintenance procedures that would be performed. In addition, the facility-specific MWMP WPCP would incorporate water quality protection measures required as conditions of the various resource agency permits.

City Storm Water Runoff and Drainage Regulations

Drainage regulations are enforced under Land Development Code Sections 142.0201 through 142.0230 (Storm Water Runoff and Drainage Regulations). The primary purpose of drainage regulations is to regulate the development of, and impacts to, drainage facilities; to limit water quality impacts from development; to minimize hazards due to flooding while minimizing the need for construction of flood control facilities; to minimize impacts to environmentally sensitive lands; to implement the provisions of federal and state regulations; and to protect the public health, safety, and welfare. The drainage regulations apply to all development in the City, whether or not a permit or other approval is required.

City Storm Water Management and Discharge Control Ordinance

The purpose of San Diego Municipal Code Sections 43.0301 through 43.0312 (Stormwater Management and Discharge Control) is to restore and maintain the water quality of receiving waters and further ensure the health, safety, and general welfare of the citizens of the City. The ordinance prohibits non-storm-water discharges, including spills, dumping, and disposal of materials other than storm water to the MS4, and reduces pollutants in discharges from the MS4 to receiving waters to the maximum extent practicable in a manner consistent with the CWA. The Ordinance also requires implementation of BMPs required in the JRMP, including erosion and sediment control BMPs per the Storm Water Standards Manual, and describes enforcement authorities and remedies that can be used in instances of noncompliance.

2.3 OTHER PERTINENT PLANNING DOCUMENTS

The City has pursued independent integrated planning efforts to meet regulatory and other water quality planning requirements. The following section summarizes additional City asset-management-based planning efforts.

Watershed Asset Management Plan

The City developed a *Watershed Asset Management Plan* to document the current state of assets (e.g., asset inventory, valuation, condition, risk) and to project the long-range asset renewal (rehabilitation and replacement) requirements. The City *Watershed Asset Management Plan* is a long-range planning document used to provide a rational framework for understanding and planning the asset portfolio. The 2013 *Watershed Asset Management Plan* consolidated asset information into a structured framework and used it to provide a justifiable basis to support long-term organization, operations, and asset management decisions (City of San Diego 2013b). A cost update to the *Watershed Asset Management Plan* was completed in 2017 (City of San Diego 2017).

2.4 POLLUTANTS IN STORM WATER RUNOFF

Storm water and non-storm-water discharges from MS4s contain pollutants that cause or threaten to cause impacts to surface water beneficial uses, as outlined in the Basin Plan. In the San Diego region, MS4s discharge runoff into receiving waters, such as lakes, reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, and the Pacific Ocean, within 11 hydrologic units (HUs). The RWQCB considers rivers, streams, and creeks that convey runoff in developed areas to be part of the MS4, regardless of whether they are earthen, engineered, or partially modified.

The most common pollutants in runoff discharged from the MS4 are total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and polychlorinated biphenyls [PCBs]), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash (RWQCB 2013). Pollutants in runoff discharged from the MS4 can threaten and adversely affect the health of humans and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses, such as impaired reproduction or growth anomalies, to mortality. In some cases, the individual or cumulative effects of pollutants to benthic and other organisms can lead to impacts to beneficial uses and/or water body impairments. Increased volume, velocity, rate, and duration of storm water runoff also has the potential to cause accelerated erosion and subsequent sedimentation of downstream water bodies. Stream channels altered due to changes in runoff may adversely affect habitat for aquatic and terrestrial organisms (RWQCB 2013).

Water quality monitoring data submitted by MS4 Copermittees in the San Diego region indicates persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations (RWQCB 2013). Several receiving waters and water body segments have been designated as impaired (303(d)-listed) by the RWQCB, pursuant to regulations in Section 303(d) of the CWA. Persistent toxicity has also been observed at several watershed monitoring stations (RWQCB 2013) and resulted in water body 303(d) listings for toxicity. In addition, bioassessment data indicate that the majority of the monitored receiving waters have “poor” to “very poor” Index of Biological Integrity (IBI) ratings. The combined effect of pollutants in runoff and benthic effects resulting from increased volume, velocity, rate, and duration of storm water runoff prevalent in disturbed, urbanized watersheds allows potential multi-variate interrelated impacts to receiving water quality (RWQCB 2013).

A summary of potential impacts related to these common pollutants in runoff is presented below.

Sediment

The movement of water as part of the Earth’s hydrologic cycle includes natural processes of downstream sediment transport in undisturbed watersheds. In disturbed watersheds, anthropogenic sources of sediment, including construction sites, agricultural practices, erosion of disturbed surfaces, wind and aerial deposition, vehicle and pedestrian tracking, and improper sediment disposal, can contribute to sediment transport processes and cause deleterious water quality impacts. In urban areas, sediment can collect on paved or other surfaces and be subsequently re-suspended and delivered to receiving waters through the MS4 during storm events. Although erosion and sediment deposition occur as a natural part of stream processes,

storm water runoff in urbanized areas may exceed natural runoff rates and potentially lead to increased stream bank erosion and downstream sedimentation (*Hydrology and Hydraulics Technical Report* (City of San Diego 2019b)).

Suspended sediment and turbidity in receiving waters can cause harm to aquatic organisms by abrasion of surface membranes and interference with respiration and sensory perception in aquatic fauna, and may adversely impact the habitat of benthic aquatic organisms. Sediment and turbidity can reduce photosynthesis and impact survival of aquatic flora by limiting the transmittance of light and hindering normal aquatic plant growth (Responsible Agencies Tijuana River WMA 2016). Sediment originating from urban areas is also sometimes associated with other pollutants, such as metals, oil and grease, petroleum residues, polycyclic aromatic hydrocarbons (PAHs), bacteria, nutrients, pesticides, and trash. Accidental releases of sediment containing these pollutants could result in an increase in pollutant discharge to surface water and groundwater, violate water quality standards, and impair beneficial uses of receiving waters.

Pathogens

Pathogens are microorganisms that cause diseases in other organisms. Bacteria are the primary indicator organisms of pathogens, particularly for the detection of waterborne diseases. Fecal contamination can be detected by bacterial indicators, such as total coliforms, fecal coliforms, *Escherichia coli* (*E. coli*), and fecal *Enterococci*. High concentrations of some of these indicator bacteria may indicate poor waste management/disposal from sources such as urban runoff, agricultural runoff, sewage spills and septic tanks, illegal encampments, and bacteria-contaminated sediment. Wildlife may also be a source of bacterial indicators in receiving waters. Bacteria contributions from wild animals and decaying plant sources in wildlife areas have been documented for some WMAs (Responsible Agencies San Diego Bay WMA 2016). The presence of pathogens in surface waters may have the potential to threaten the health of wildlife and recreational users of water bodies (RWQCB 2016).

Metals

Sources of metals, such as dissolved copper, lead, and zinc, have been attributed to transportation (e.g., roads and freeways) and commercial/industrial land uses, which may include both point and non-point sources. Some metals in sufficient concentrations and under certain receiving water conditions may be toxic to aquatic organisms. Elevated levels of copper, lead, and zinc may cause adverse effects in biological species. Dissolved forms of these metals can adsorb to particulate matter in the water column and/or be directly taken up by aquatic organisms such as bacteria, algae, plants, and planktonic and benthic organisms (Responsible Agencies San Diego Bay WMA 2016).

Polycyclic Aromatic Hydrocarbons

PAHs consist of hundreds of separate chemicals that occur together as mixtures. PAHs are naturally occurring from the burning of fossil fuels and the incomplete burning of carbon-containing materials (such as wood, tobacco, and coal). Storm water runoff sources of PAHs include atmospheric deposition; coal gasification; and runoff from parking lot and road surfaces, which transport PAHs that originate from tire particles, motor oil, vehicle exhaust, crumbling asphalt, and parking lot sealants. PAHs attach readily to sediment particles, leading to high concentrations in bottom sediments of water bodies. Some PAHs are known to be toxic to aquatic animals and humans (NCSU 2012).

Synthetic Organics

Synthetic organics may include such substances as pesticides, herbicides, and PCBs. Synthetic organic compounds can enter surface water and groundwater directly through industrial process discharges, agricultural discharge, spillage, and illegal dumping. Pesticides and herbicides can also enter surface water and groundwater indirectly by drifting away from areas where they are being sprayed, through surface runoff from treated fields, and by leaching or return flows from irrigation. Pesticides can concentrate in plant and animal tissue, and many are considered to be carcinogenic to humans. Although many pesticides are designed to deteriorate rapidly when exposed to sunlight and air, they may persist for months or years in water (RWQCB 2016).

Nutrients

Nutrients such as nitrogen and phosphorus are naturally occurring inorganic ions present in the atmosphere and in fixed forms in organic matter such as plants and soils. Activities related to agriculture and land development, and urban runoff can serve as nutrient sources and have the potential to cause excessive loading to water bodies. Excessive nutrient loading in receiving waters can produce toxic or eutrophic conditions, both of which impair aquatic life. Eutrophication can also lead to increased algal growth and reduced oxygen levels in water bodies, thus reducing aesthetic quality and habitat value of the receiving water. Ammonia may be toxic to aquatic life under elevated pH conditions associated with eutrophication (RWQCB 2016).

Oxygen-Demanding Substances

Oxygen-demanding substances such as decaying vegetation and animal waste may originate from agricultural sources, urban runoff such as landscaping debris and waste, pet waste, and illegal dumping of vegetative debris. Oxygen-demanding substances may decrease oxygen levels to below those vital for aquatic life. Depression of dissolved oxygen levels can lead to fish kills and odors resulting from anaerobic decomposition (RWQCB 2016).

Trash

Trash in state waters is related to direct and indirect anthropogenic activities on land, along coastal shorelines, and offshore. The primary sources and transport mechanisms of trash to receiving waters are littering by the public on or adjacent to water bodies; storm events carrying trash originating from littering, inadequate waste handling, or illegal dumping via the storm drain system to receiving waters; wind-blown trash, also originating from littering, inadequate waste handling, and illegal dumping; and illegal dumping into or adjacent to water bodies. Studies have shown that the main transport pathway of trash to receiving water bodies is through storm water transport (SWRCB 2015). Trash can impact habitats and aquatic life, which are threatened following ingestion of or entanglement by trash. Ingestion and entanglement can be fatal for freshwater, estuarine, and marine life. Similarly, habitat alteration and degradation due to trash can make natural habitats unsuitable for spawning, migration, and the preservation of aquatic life. Trash in state waters can impact humans by jeopardizing public health and safety, and posing harm and hindrance in recreational, navigational, and commercial activities (SWRCB 2015).

Toxicity

Toxicity can be defined as the adverse response of organisms to chemicals or physical agents (RWQCB 2016). Exposure to a single chemical, such as a metal or pesticide, can cause adverse effects to aquatic organisms. Exposure to two or more chemicals may result in toxicity that is a summation of the toxicity of the individual chemicals, or may result in a synergistic effect or toxicity that is greater than would be expected based on the summation of toxicities of individual chemicals (RWQCB 2007). Toxicity can cause acute adverse effects (mortality) or chronic effects, such as developmental abnormalities or decreased reproduction to aquatic organisms.

Benthic Community Effects

Benthic community effects are generally described as adverse biological responses resulting from exposure to toxic substances with potential impacts to beneficial uses. Benthic macroinvertebrate surveys (commonly referred to as bioassessments) are generally used to assess and score the biological and physical condition of streams and rivers using the IBI analytical tool. Bioassessment monitoring consists of data collection efforts to characterize the benthic macroinvertebrate (BMI) and algal communities in receiving waters, as well as the quality of the physical habitat and water chemistry of a monitoring site. Samples of BMIs are collected and analyzed according to standardized procedures and assessment tools (e.g., the Surface Water Ambient Monitoring Program). BMI community data are analyzed to produce biological metrics and generate IBI ratings (Responsible Agencies San Diego Bay WMA 2017).

2.5 EXISTING WATER QUALITY CONDITIONS

This section describes general existing water quality conditions for WMAs within City jurisdiction. MWMP facility-specific conditions are further described in Chapter 4. Detailed water quality condition information is available within the applicable WQIP for each WMA (Responsible Agencies San Diego County 2018). Assessment of general and facility-specific existing water quality conditions allows for the evaluation of potential short- and long-term water quality impacts related to MWMP activities.

There are six WMAs within the City's jurisdiction: San Dieguito River, Los Peñasquitos, Mission Bay, San Diego River, San Diego Bay, and Tijuana River. The San Diego Bay WMA contains three HUs: Pueblo San Diego, Sweetwater River, and Otay River. Although each HU is a functionally distinct watershed, all three discharge to San Diego Bay and, therefore, are grouped as one WMA. The WMAs and the associated major water bodies are presented in Table 2-1 and shown in Figures 2-1a through 2-1c, Location of 303(d) Listed Water Bodies and MWMP Maintenance Facilities.

Table 2-1
City of San Diego Watershed Management Areas

Watershed Management Area	Hydrologic Unit or Watershed	Major Surface Water Bodies
San Dieguito River	San Dieguito (905)	• San Dieguito River • San Dieguito Lagoon • Pacific Ocean
Los Peñasquitos	Peñasquitos (906)	• Los Peñasquitos Lagoon • Pacific Ocean
Mission Bay		• Mission Bay • Pacific Ocean • San Diego Marine Life Refuge Area of Special Biological Significance
San Diego River	San Diego (907)	• San Diego River • Pacific Ocean
San Diego Bay	Pueblo San Diego (908) Sweetwater (909) Otay (910)	• Chollas Creek • Sweetwater River • Otay River • San Diego Bay • Pacific Ocean
Tijuana River	Tijuana (911)	• Tijuana River • Tijuana Estuary • Pacific Ocean

Source: RWQCB 2013

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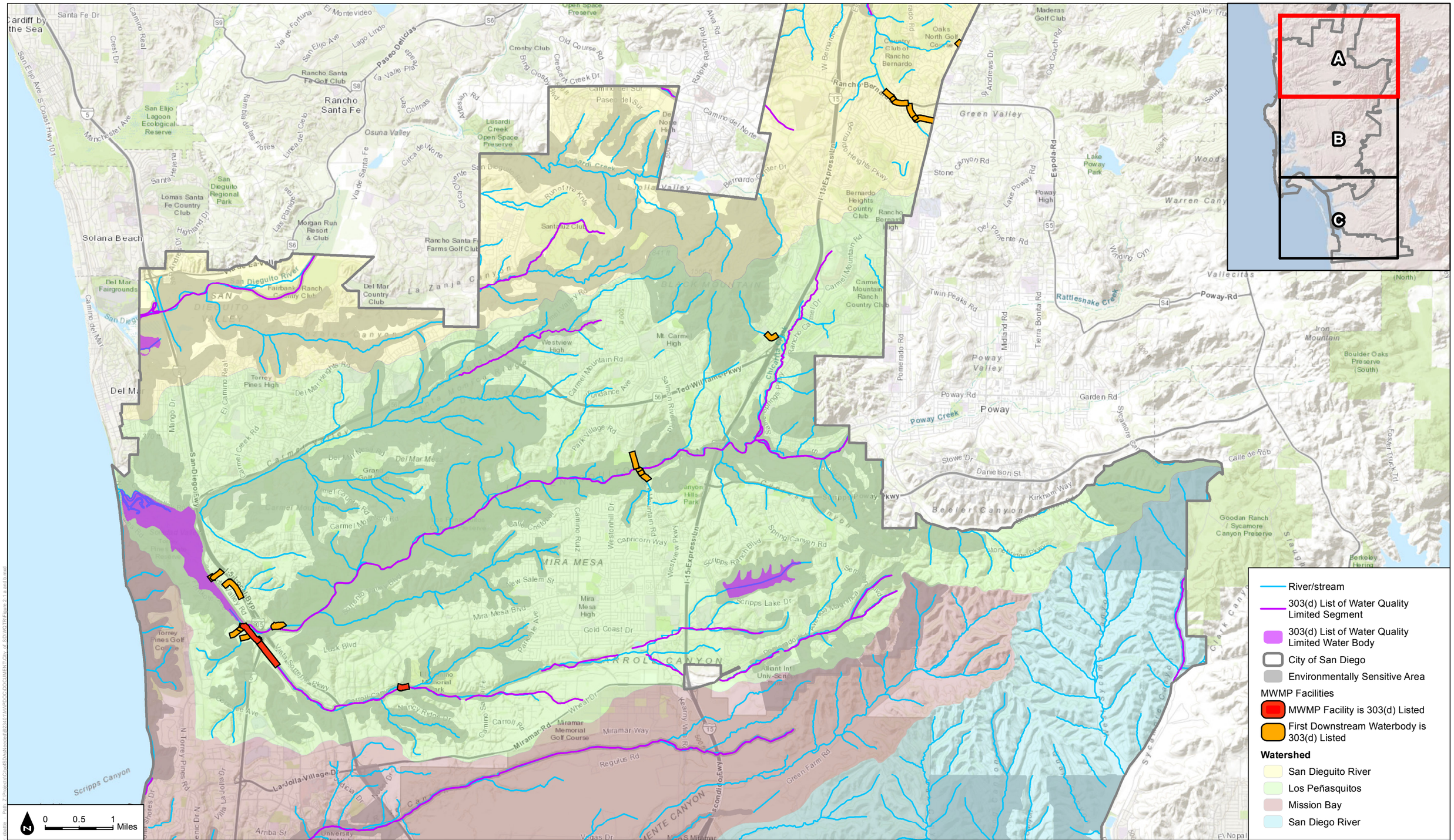

DUDEK

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Municipal Waterways Maintenance Plan

Water Quality Technical Analysis Report

Figure 2-1a - Location of 303(d) Listed Water Bodies and MWMP Maintenance Facilities

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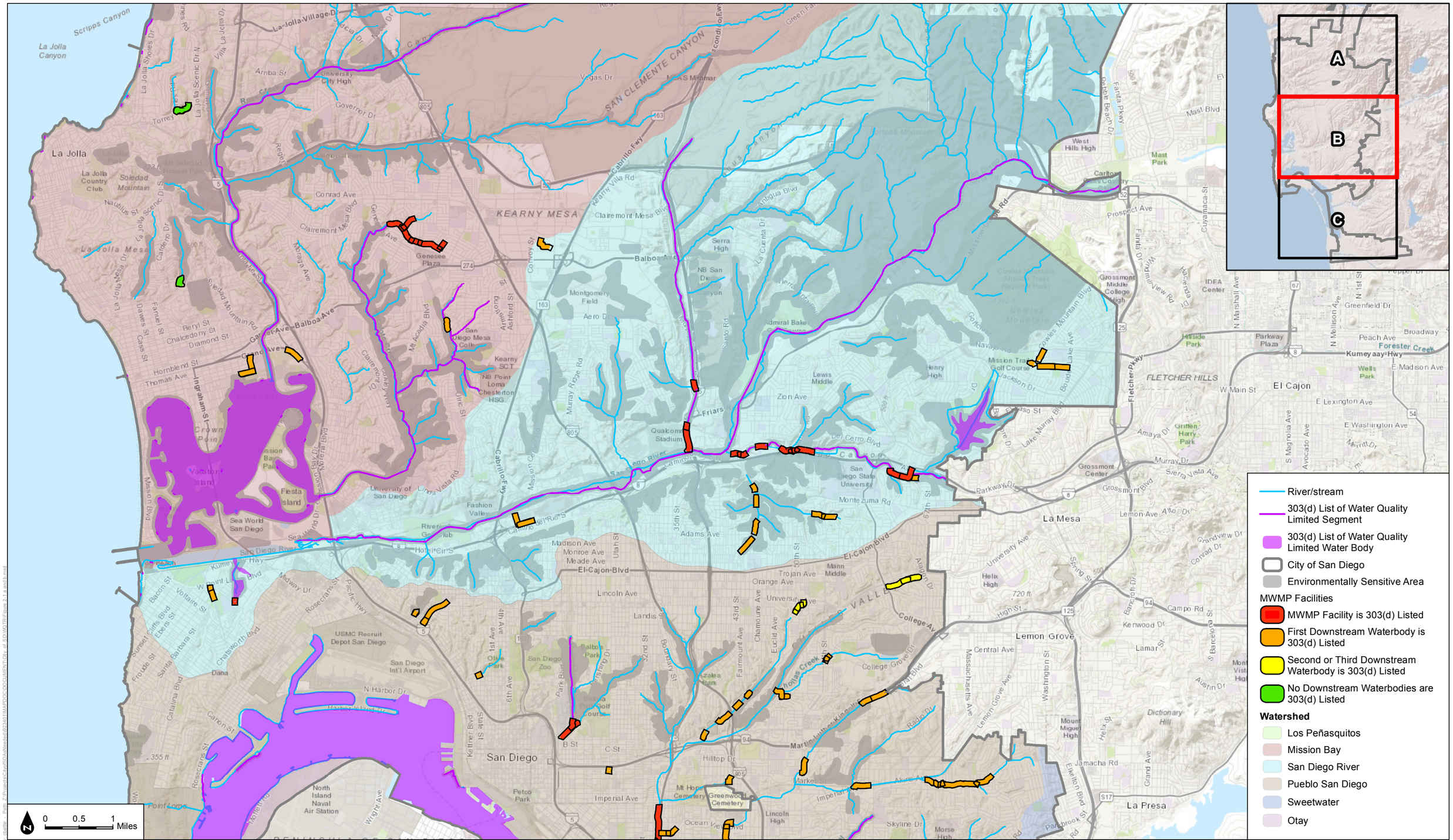

SOURCE: ESRI, 2017; SANDAG, 2017

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Municipal Waterways Maintenance Plan

Water Quality Technical Analysis Report

Figure 2-1b - Location of 303(d) Listed Water Bodies and MWMP Maintenance Facilities

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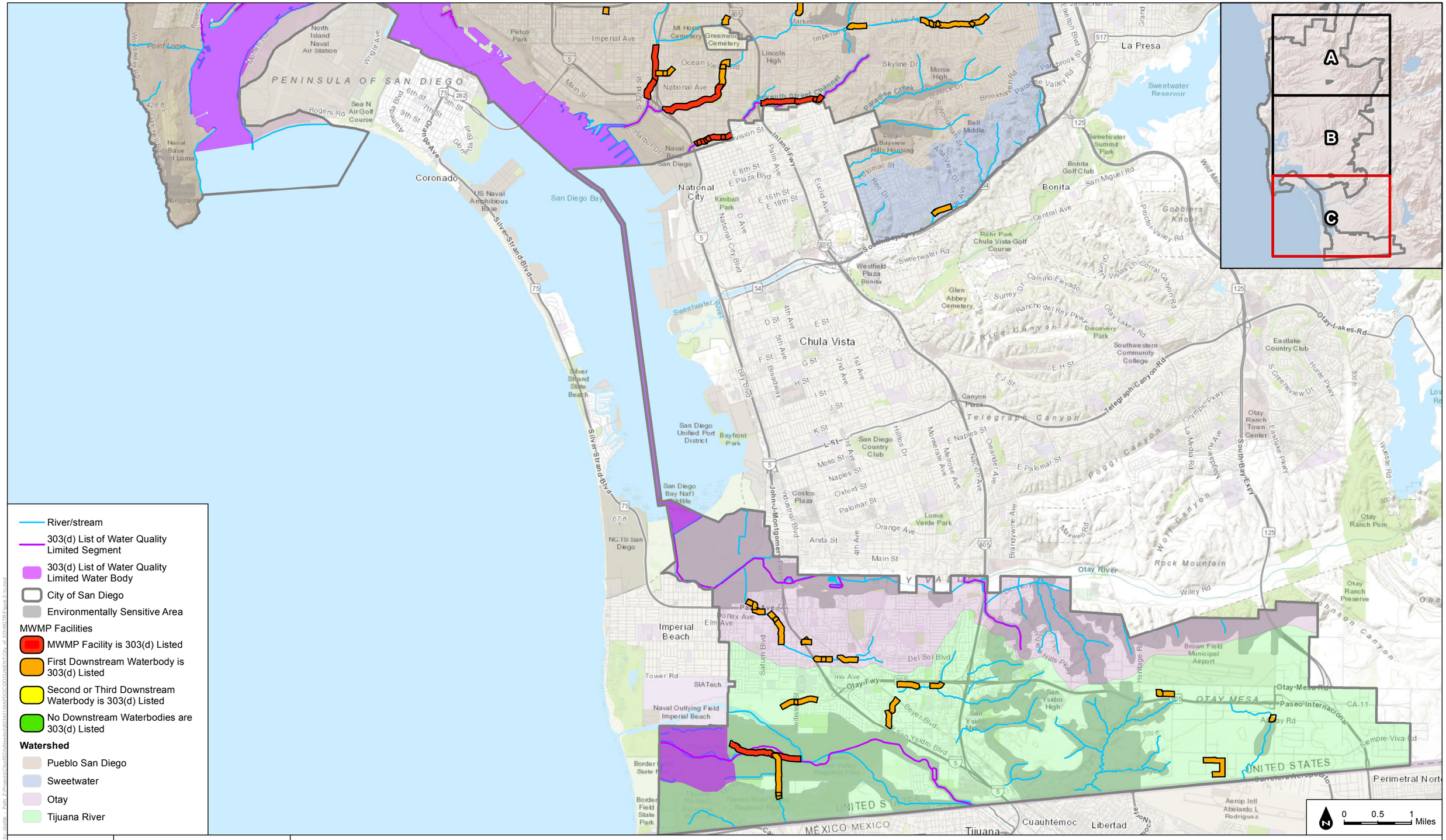

- River/stream
- 303(d) List of Water Quality Limited Segment
- 303(d) List of Water Quality Limited Water Body
- City of San Diego
- Environmentally Sensitive Area

MWMP Facilities

- MWMP Facility is 303(d) Listed
- First Downstream Waterbody is 303(d) Listed
- Second or Third Downstream Waterbody is 303(d) Listed
- No Downstream Waterbodies are 303(d) Listed

Watershed

- Pueblo San Diego
- Sweetwater
- Otay
- Tijuana River

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SOURCE: ESRI, 2017; SANDAG, 2017

Municipal Waterways Maintenance Plan

Water Quality Technical Analysis Report

Figure 2-1c - Location of 303(d) Listed Water Bodies and MWMP Maintenance Facilities

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Beneficial Uses of Water Bodies

Water body beneficial uses are identified in the Basin Plan (RWQCB 2016). Beneficial uses identified for the major water bodies in each WMA are shown in Table 2-2.

Table 2-2
Summary of Beneficial Uses by Watershed Management Area

Beneficial Uses	San Dieguito River	Los Peñasquitos	Mission Bay	San Diego River	San Diego Bay	Tijuana River
Municipal and domestic supply (MUN)	X	+	+	X	+	+
Agricultural supply (AGR)	X	X		X	X	X
Industrial service supply (IND)	X	X	X	X	X	P
Industrial Process Supply (PROC)	X					
Groundwater recharge (GWR)	P					
Freshwater replenishment (FRSH)						
Hydropower generation (POW)				X		
Contact water recreation (REC-1)	X	X	X	X	X	X
Non-contact recreation (REC-2)	X	X	X	X	X	X
Preservation of biological habitats of special significance (BIOL)	X	X	X	X	X	X
Warm freshwater habitat (WARM)	X	X	X	X	X	X
Cold freshwater habitat (COLD)	X	X		X		
Wildlife habitat (WILD)	X	X	X	X	X	X

Table 2-2
Summary of Beneficial Uses by Watershed Management Area

Beneficial Uses	San Dieguito River	Los Peñasquitos	Mission Bay	San Diego River	San Diego Bay	Tijuana River
Rare, threatened, or endangered species (RARE)	X	X	X	X	X	X
Spawning, reproduction, and/or early development (SPWN)	X	X	X	X	X	X
Navigation (NAV)	X		X	X	X	
Commercial and sport fishing (COMM)	X		X	X	X	X
Estuarine habitat (EST)		X	X		X	X
Marine habitat (MAR)	X	X	X	X	X	X
Aquaculture (AQUA)	X		X	X		
Migration of aquatic organisms (MIGR)	X	X	X	X	X	X
Shellfish harvesting (SHELL)	X	X	X	X	X	X

X = Existing Beneficial Use, P = Potential Beneficial Use, + = Exempted from MUN Beneficial Use; Blank Cells = Not an Existing Beneficial Use

Groundwater recharge is generally not a designated beneficial use for water bodies in the San Diego region. Tables showing WMA-specific beneficial uses for water bodies that may potentially be impacted by MWMP maintenance activities are provided in Appendix B. The tables include water bodies for which maintenance is proposed and lists the first downstream water body.

303(d) Listings of Water Bodies

As described in Section 2.2, Regulatory Framework, of this *Water Quality Technical Analysis Report*, 303(d)-listed water bodies are listed waters that do not meet established water quality standards. Table 2-3 summarizes the 303(d) listings for the major water bodies where maintenance is proposed for the six WMAs where the City has jurisdiction. Listings in the table are based on the 2014 303(d) list (RWQCB 2017). The 303(d) listings for specific MWMP facilities proposed for maintenance are presented in Chapter 4, Results, of this report.

Table 2-3
Summary of 303(d) Listings by Watershed Management Area

Watershed Management Area	Water Body	303(d) Listing/Impairment
San Dieguito River	Green Valley Creek	Benthic community effects, bifenthrin, chloride, chlorpyrifos, manganese, pentachlorophenol (PCP), sulfates, total nitrogen as n
	Lake Hodges	Color, manganese, mercury, nitrogen, phosphorus, turbidity, pH
	Pacific Ocean Shoreline, San Dieguito Hydrologic Unit, at San Dieguito Lagoon Mouth at San Dieguito River Beach	Indicator Bacteria
	San Dieguito River	Benthic community effects, indicator bacteria, nitrogen, phosphorus, total dissolved solids, toxicity
Los Peñasquitos	Los Peñasquitos Creek	Benthic community effects, bifenthrin, chlorpyrifos, indicator bacteria, nitrogen, phosphate, total dissolved solids, toxicity
	Los Peñasquitos Lagoon	Sedimentation/Siltation, toxicity
	Pacific Ocean Shoreline, Miramar Reservoir Hydrologic Area, at Los Peñasquitos River mouth	Indicator bacteria
	Soledad Canyon	Sediment toxicity, selenium
Mission Bay	Tecolote Creek	Benthic community effects, bifenthrin, cadmium, copper, cypermethrin, diazinon, indicator bacteria, lead, nitrogen, phosphorus, selenium, toxicity, turbidity, zinc
	Mission Bay (area at mouth of Rose Creek only)	Eutrophic, lead

Table 2-3
Summary of 303(d) Listings by Watershed Management Area

Watershed Management Area	Water Body	303(d) Listing/Impairment
	Mission Bay (area at mouth of Tecolote Creek only)	Eutrophic, lead
	Mission Bay Shoreline, at De Anza Cove	Indicator bacteria
	Rose Creek	Benthic community effects, selenium, toxicity
San Diego River	Alvarado Creek	Nitrogen, selenium
	Murray Reservoir	Nitrogen, pH (both delisted)
	Pacific Ocean Shoreline, San Diego Hydrologic Unit, at the San Diego River outlet, at Dog Beach	Indicator bacteria
	San Diego River (Lower)	Benthic community effects, cadmium, indicator bacteria, low dissolved oxygen, nitrogen, phosphorus, total dissolved solids, toxicity
San Diego Bay	Chollas Creek	Bifenthrin, chlorpyrifos, copper, cypermethrin, diazinon, indicator bacteria, lead, malathion, nitrogen, phosphorus, trash, zinc
	Paleta Creek	Copper, lead
	San Diego Bay	Mercury, PAHs (polycyclic aromatic hydrocarbons), PCBs (Polychlorinated biphenyls)
	San Diego Bay Shoreline, near Chollas Creek	Benthic community effects, sediment toxicity
	Sweetwater River, Lower (below Sweetwater Reservoir)	Benthic community effects, chlorpryifos, indicator bacteria, nitrogen phosphorus, selenium, total dissolved solids, toxicity

Table 2-3
Summary of 303(d) Listings by Watershed Management Area

Watershed Management Area	Water Body	303(d) Listing/Impairment
Tijuana River	Tijuana River	Ammonia as nitrogen, benthic community effects, cadmium, chlorpryifos, diazinon, eutrophic, indicator bacteria, low dissolved oxygen, malathion, pesticides, phosphorus, sedimentation/siltation, selenium, solids, surfactants (MBAS), synthetic organics, total nitrogen as N, toxicity, trace elements, trash
	Tijuana River Estuary	Eutrophic, indicator bacteria, lead, low dissolved oxygen, nickel, pesticides, thallium, toxicity, trash, turbidity

Source: RWQCB 2017

Adopted Total Maximum Daily Loads

Some water bodies in the MWMP facility maintenance areas are subject to the requirements of adopted TMDLs. Certain segments of the San Dieguito River, Los Peñasquitos, Mission Bay, San Diego River, and San Diego Bay WMAs are subject to requirements in the Revised Total Maximum Daily Loads for Indicator Bacteria, Project I (Resolution No. R9-2010-0001) (RWQCB 2010). Los Peñasquitos WMA also has a TMDL for sediment: the Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon (Resolution No. R9-2012-0033) (RWQCB 2012). There are two additional TMDLs in effect for Chollas Creek in the San Diego Bay WMA: the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek (Resolution No. R9-2007-0043) (RWQCB 2007), and the Total Maximum Daily Load for Diazinon in Chollas Creek Watershed (Resolution No. R9-2002-0123) (RWQCB 2002). Numeric limits, compliance schedules, and monitoring requirements of the adopted TMDLs are incorporated into the WQIPs and the Regional MS4 Permit. Specific MWMP facilities proposed for maintenance located within water bodies that have adopted TMDLs are included in Table 4-1 in Chapter 4 of this report.

Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are part of the project planning process for implementing storm water standard requirements in the City's Storm Water Standards Manual (City of San Diego 2018a).

Wetlands

Wetlands are defined and identified in the *Biological Resources Technical Report* (City of San Diego 2019c) based on local, state, and federal guidance. Wetlands are delineated based on three characteristics or parameters: (1) wetland hydrology, (2) hydric soils, and (3) hydrophytic vegetation. Although jurisdictional wetlands may be different for each agency, state and federal wetlands are typically defined as having all three characteristics. However, as defined by the City's Land Development Code Section 113.0103 (City of San Diego 2019d), wetlands are areas characterized by any one of the following conditions: all areas persistently or periodically containing naturally occurring wetland vegetation communities characteristically dominated by hydrophytic vegetation, including salt marsh, brackish marsh, freshwater marsh, riparian forest, oak riparian forest, riparian woodlands, riparian scrub, and vernal pools; areas that have hydric soils or wetland hydrology and lack naturally occurring wetland vegetation communities because human activities have removed the historic wetland vegetation, or catastrophic or recurring natural events or processes have acted to preclude the establishment of wetland vegetation, as in the case of salt pannes and mudflats; areas lacking wetland vegetation communities, hydric soils, and wetland hydrology due to non-permitted filling of previously existing wetlands; or areas mapped as wetlands on Map C-713 as shown in Chapter 13, Article 2, Division 6 (Sensitive Coastal Overlay Zone) of the Land Development Code. Furthermore, the City, as well as state and federal resource agencies, try to differentiate between naturally occurring wetlands and wetlands intentionally created by human actions or activities in historically non-wetland areas to determine if an activity affecting wetlands or non-wetlands is regulated and would require permits.

The *Biological Resources Technical Report* (City of San Diego 2019c) identifies the MWMP facilities that contain wetlands consistent with the above-defined conditions. Table 4-1 of this report identifies the specific MWMP facilities where wetland impacts may occur and the extent (area) of wetland impacts that may result from performance of MWMP maintenance activities.

Groundwater

Aquifers are groundwater-bearing formations sufficiently permeable to transmit and yield significant quantities of water. In the San Diego region, there are groundwater-bearing geologic formations that do not meet the definition of an aquifer. Accordingly, for basin planning and regulatory purposes, the term "groundwater" includes all subsurface waters that occur in fully saturated zones within soils and other geologic formations (RWQCB 2016). Subsurface waters are considered groundwater even if the waters do not occur in an aquifer or an identified groundwater basin.

Groundwater in the San Diego region is mostly found as saline brackish water that typically requires additional treatment (desalination) before use as water supply. Groundwater production in the

region is typically limited by a number of factors, including lack of storage capacity in local aquifers, availability of groundwater recharge, and degraded water quality (SDCWA 2018). Narrow alluvial valleys filled with shallow sand and gravel deposits are characteristic of the most productive groundwater basins in the San Diego region. Outside of the principal alluvial aquifers and farther inland, groundwater occurs in fractured bedrock and semi-consolidated sedimentary deposits where yield and storage are limited. Aquifers with these characteristics are best suited for lower-yielding domestic water supply wells (SDCWA 2018). The San Diego region lacks large groundwater basins suitable for large-scale groundwater replenishment projects. Currently, less than 1% of the City's water supply is produced from groundwater resources (City of San Diego 2014a).

Although groundwater supplies are less plentiful in the San Diego region than in some other areas of California, these supplies have been identified as a potential source to help meet a greater portion of the region's future water supply and storage needs. The City is presently assessing the development potential of all its groundwater resources through various suitable water quality control and sustainable groundwater management plans. Groundwater basins within the City's jurisdiction include the San Pasqual Valley Basin, San Dieguito Basin, Santee/El Monte Basin, Mission Valley Basin, San Diego Formation, and the Tijuana Basin. The basins are relatively small in area and typically shallow (City of San Diego 2018e).

MWMP facilities generally occupy minor portions of watershed drainage areas that serve as part of surface storm water conveyance in the semi-arid San Diego region. Additionally, nearly all MWMP facilities are situated in second- or third-order streams that convey intermittent and low flows and contribute little to no recharge via leakage to groundwater. Finally, MWMP FMPs do not propose work in any areas of standing surface water or designed infiltration and/or spreading basins. Therefore, MWMP activities would not substantially decrease groundwater supplies or interfere with groundwater recharge because the MWMP involves facilities with no significantly established connection to underlying aquifer systems. MWMP activities would not significantly impede or obstruct the implementation of sustainable groundwater management plans for underlying principal aquifers.

2.6 SUMMARY OF EXISTING WATER QUALITY MONITORING EFFORTS

Extensive water quality monitoring is being conducted within the MWMP program area through WQIPs and other compliance and special study efforts and stored in a regional clearinghouse (Responsible Agencies San Diego County 2018). The WQIP Monitoring and Assessment Programs have three major components: receiving water monitoring, MS4 outlet discharge monitoring, and special studies. Receiving waters and MS4 outlets/drain structures are monitored in both wet and

dry weather. Collected samples are analyzed for a variety of parameters, including indicator bacteria, suspended solids, pH, metals, nutrients, pesticides, and organics.

Receiving water monitoring also includes bioassessment and sediment quality monitoring. A regional study conducted by the Southern California Stormwater Monitoring Coalition provides regional bioassessment monitoring data related to stream conditions (SMC 2018). Sediment quality monitoring in San Diego Bay and Mission Bay is also being performed (Responsible Agencies San Diego County 2018). Special studies include a regional study to evaluate HPWQCs for the entire San Diego region that is in progress (Responsible Agencies San Diego County 2018). The City and other local agencies also partner with the Southern California Coastal Waters Research Project to collect data for the Southern California Bight Program (SCCWRP 2018). The Southern California Bight Program is a cyclical set of special studies focused on coastal waters and their tributaries from Ventura to San Diego.

Additional monitoring is completed to meet TMDL requirements, where applicable. TMDL monitoring includes bacteria testing in the San Dieguito River, Los Peñasquitos, Mission Bay, San Diego River, and San Diego Bay WMAs. Heavy metals and diazinon monitoring is conducted in the San Diego Bay WMA. Sediment and vegetation monitoring occurs in Los Peñasquitos WMA. A summary of TMDL-related monitoring effort and results are available as part of Water Quality Report Cards produced by the RWQCB (RWQCB 2018a).

A suite of environmental monitoring data is available through public and private sources. The Surface Water Ambient Monitoring Program (SWAMP) compiles statewide water quality monitoring data (SWRCB 2018a). Environmental groups such as San Diego Coastkeeper also regularly monitor local water bodies (San Diego Coastkeeper 2018). Data from the SWAMP, environmental groups, and the City and other Copermittees are uploaded to the California Environmental Data Exchange Network, where it is available to the public (SWRCB 2018b).

In early 2018, the RWQCB requested that Copermittees, including the City, submit all current geographic information system (GIS) layers and files used to maintain their MS4 maps to a regional clearinghouse (Responsible Agencies San Diego County 2018). The information was requested to ensure compliance with the provisions of the Regional MS4 Permit and to increase the RWQCB's understanding of the connectivity between pollutant sources and receiving water quality in the San Diego region. Watershed-based GIS information was compiled and submitted to the RWQCB in March 2018.

3 TECHNICAL METHODOLOGY

This section summarizes the technical methodology used to evaluate existing water quality conditions within the context of MWMP maintenance activities.

3.1 WATER QUALITY EVALUATION APPROACH

Existing water quality and facility conditions for MWMP facilities were evaluated by assessing available facility-specific water quality information. Assessed information included available water quality existing conditions (see Chapter 2), the MWMP *Hydrology and Hydraulics Technical Report* (City of San Diego 2019b), *Biological Resources Technical Report* (City of San Diego 2019c), and MWMP facility-specific information (City of San Diego 2019a). MWMP facility-specific information consisted of the following:

- Field survey information
- Presence/location of facilities proposed for maintenance relative to ESAs and/or Environmentally Sensitive Lands
- Presence of sensitive species and habitat
- Presence of wetland vegetation
- Proposed impact area, including staging and access areas
- Proposed maintenance methods
- Previous mitigation by compensatory wetlands mitigation
- Location of proposed compensatory wetland mitigation

The compiled data and information were used to characterize MWMP facility-specific water quality conditions as a basis to evaluate potential impacts to water quality from maintenance activities. In addition to existing conditions in the facilities to be maintained, existing water quality conditions downstream of the facilities were also evaluated.

WQIPs were used as the primary source of water quality information in the analysis. Water quality conditions identified in the WMA-specific WQIPs informed the analysis of potential maintenance impacts. Field survey information, presence of sensitive species and habitat, presence of wetland vegetation, previous compensatory wetlands mitigation, and the location of proposed compensatory wetland mitigation areas were derived from the *Biological Resources Technical Report* (City of San Diego 2019c). Information regarding proposed impacts and proposed maintenance

methods were derived from the *Facility Maintenance Plan* prepared as part of the MWMP (see Appendix A to City of San Diego 2019a).

Water quality conditions were evaluated within the context of the proposed maintenance activities to assess the potential for short- and long-term impacts to water quality, as described in the following sections. Within the context of the MWMP, project activities that forego adherence to the City's Storm Water Standards Manual are considered a short-term impact. MWMP project activities that potentially otherwise degrade water quality are considered long-term impacts.

3.2 POTENTIAL SHORT-TERM IMPACTS

Maintenance activities proposed under the MWMP were assessed to evaluate potential impacts to existing water quality conditions during maintenance. Maintenance impacts may have the potential to cause temporary increases in pollutant discharge to surface water and/or groundwater, primarily associated with sediment discharge, trash, and/or vehicle-related pollutants. Where applicable and during dry conditions where no vegetation is present and appropriate permits are in place, concrete, shotcrete, gunite, and/or riprap to repair or replace existing hardscape structures and bank repair may occur. These potential impacts would generally be short-term and infrequent, and confined primarily to immediate area of the individual maintenance activities being performed. Maintenance activities include both ground disturbance and potential pollutant discharge components.

Ground Disturbance

MWMP maintenance activities include ground disturbance, use of heavy equipment, handling and disposal of sediment and vegetation, application and handling of herbicides, temporary flow diversion, and permitted repairs to infrastructure (City of San Diego 2019a). MWMP maintenance activities that involve ground disturbance and associated exposed soils may potentially increase sediment levels in storm water runoff by eroding soils that have been loosened or newly exposed by maintenance activities. Increased sediment levels in storm water runoff could exacerbate existing water quality problems in sediment-impaired waters and/or ESAs. General categories of ground disturbance and associated activities resulting in exposed soil include the following:

- Sediment/debris removal
- Vegetation management
- Bank repair
- Invasive plant species management

Pollutant Discharge

MWMP activities would involve various activities that may potentially cause or contribute to short-term discharge of pollutants. Increased pollutants related to maintenance activities such as vehicular fluids or herbicides could exacerbate existing water quality problems in impaired waters. General categories of MWMP activities that may result in short-term discharge of pollutants include the following:

- Spills and leaks
- Application and handling of herbicides
- Temporary flow diversions
- Permitted infrastructure repair and replacement

Accidental spills and leaks, inadvertent herbicide releases, flow diversion activities, and use of materials and methods associated with permitted infrastructure repair and replacement each have specific potential pollution prevention, source control, and operational BMPs that may be used to reduce or eliminate pollutant discharge.

Existing facility and water quality conditions and proposed maintenance activities were evaluated to determine the specific potential pollutant sources that may have the potential to impact water quality during maintenance. The MWMP process requires site-specific WPCP development using the MWMP's *Water Pollution Control Plan Guidance Document* (Appendix B of the MWMP (City of San Diego 2019a)). The site-specific WPCP will identify facility-specific plans for BMPs and pollution prevention measures that will be implemented.

3.3 POTENTIAL LONG-TERM IMPACTS

Proposed MWMP facility maintenance activities include vegetation management, invasive plant species management, sediment/debris removal, and structural clearing/trash fence clearing. Activities may be performed within and adjacent to earthen and concrete-lined channels, and have potential for impacts to water quality and downstream receiving water conditions. Potential long-term direct and indirect impacts may occur if MWMP activities result in substantial degradation of water quality. In watershed systems, wetland vegetation, channel configuration, and biological conditions contribute to water quality and downstream receiving water condition.

In undisturbed watersheds, wetland vegetation, channel configuration, and biological conditions can have positive impacts on water quality by spreading out and slowing down flows, providing shade, allowing for nutrient uptake, and reducing potential for anthropogenic sources of erosion and

sediment transport. Certain wetland vegetation species and plant density types can function to trap and prevent sediment from affecting downstream environments. Wetland vegetation may also provide flow attenuation and pollutant uptake capability under certain hydrologic, soil, and chemical conditions. The relative importance of these factors may shift in disturbed watershed areas. Combined, the presence and interaction of certain vegetation and soils within appropriately configured channels and healthy biological communities potentially provide for long-term water quality benefits. These benefits are estimated to be deminimus in situations where only unvegetated wetlands occur (e.g., natural flood channel) or wetlands are non-jurisdictional, as determined by the U.S. Army Corps of Engineers (e.g., isolated basins).

Quantification of potential long-term water quality impacts resulting from channel maintenance activities in undisturbed and disturbed watersheds requires evaluation of multiple site-specific factors. Site-specific condition evaluation of hydrology, soil, and vegetation composition is needed to assess potential facility water quality and pollutant removal benefits. Hydrology characteristics include residence time of stream flow within a defined channel area, hydroperiod or the seasonal pattern of water level, and water depth. Soil characteristics—including the presence of hydric soils (i.e., soils that are permanently or seasonally saturated by water), grain size, compaction, soil inorganic chemistry, redox potential, ion exchange capacity, pH, conductivity, composition of organic matter, microbial community composition, soil biological organism concentration, and function—all can potentially impact site-specific pollutant removal capacity. Wetland vegetation composition characteristics, such as species diversity, density, and age, may all independently or collectively impact water quality. Watershed-scale factors such as urbanization and associated hydromodification and pollutant loading may also influence the capacity of wetland vegetation to uptake pollutants and provide for pre-maintenance water quality benefits in MWMP facilities.

3.4 MWMP WATER QUALITY PROTECTION MEASURES

This section describes the MWMP approach to address short- and long-term impacts to water quality.

Short-Term Water Quality Impact Protection Measures

The City's Storm Water Standards Manual (City of San Diego 2018a) was designed to ensure that projects are developed and conducted in a manner that avoids increases in pollutant discharge to receiving waters and groundwater, including downstream sedimentation, including discharges to already impaired waters or ESAs. Implementation of BMPs consistent with the MWMP's *Water Pollution Control Plan Guidance Document* would ensure that proposed MWMP maintenance activities are properly implemented to protect surface water quality and groundwater (if present), and adhere to the City's Storm Water Standards (City of San Diego 2018a) water quality standards and WDRs. Compliance with the City's current Storm Water Standards Manual is ensured through permit conditions, and, for public

projects, is the responsibility of the department implementing the project (in this case, the City's Transportation & Storm Water Department). Adherence to the City's Storm Water Standards Manual is the water quality threshold, and is considered to preclude water quality impacts, unless substantial evidence supports a fair argument that a significant impact will still occur (City of San Diego 2016).

As described in Section 2.2, the City's Storm Water Standards Manual requires development of a WPCP that outlines the BMPs and pollution prevention measures (hereafter referred to as "facility water quality protection BMPs") that would be implemented for each project. Facility water quality protection BMPs include project planning, good site management "housekeeping," non-storm-water management, erosion control, sediment control, and run-on and runoff control.

A facility-specific WPCP would be developed for each MWMP facility prior to maintenance. An MWMP-focused WPCP working document for preparing facility-specific WPCPs was developed by the City (*Water Pollution Control Plan Guidance Document*; Appendix B of City of San Diego 2019a), and facility-specific WPCPs will be tailored to address facility-specific water quality conditions and BMP requirements based on the actual maintenance procedures that will be performed. The MWMP *Water Pollution Control Plan Guidance Document* is tailored to incorporate BMPs as appropriate for maintenance. In addition, the WPCPs will incorporate water quality protection measures required as conditions of the various resource agency permits (Appendix B of City of San Diego 2019a).

Table 4-1 in Chapter 4 lists the MWMP facilities proposed for maintenance. Site-specific facility water quality protection BMPs for these facilities would be prepared as part of the WPCP. As part of the site-specific WPCP process, site-specific facility map(s) would be prepared to assess current conditions and applicable BMPs. Exhibit 2 shows an example of a BMP for an MWMP facility.

Exhibit 2. Example of WPCP BMP

Long-Term Water Quality Impact Approach

The MWMP applies a multi-faceted approach to address potential long-term water quality impacts related to maintenance activities. The proposed MWMP maintenance areas incorporate avoidance and minimization by using hydrology-based data to minimize maintenance to only those areas where maintenance provides a reduction in flood risk. This approach is also coordinated with the City's Watershed Master Plans and WQIPs to plan for integrated flood management and water quality improvements. Where maintenance results in unavoidable wetland impacts, the City would implement stream restoration/biological compensatory wetlands mitigation at established ratios, pursuant to the City of San Diego Biology Guidelines. Wetlands mitigation would provide compensation for the loss of wetland functions and values that may result from maintenance activities. The established ratios account for the multiple functions that wetlands can support, including those associated with pollutant assimilative capacity losses and temporal loss (e.g., time between impact and establishment of functioning habitat). The established ratios are also sufficient to mitigate wetland area and function in typical development scenarios where wetlands are fully removed and constructed over (e.g., development over a previous wetland area and storm water is then conveyed in an underground piped system). In the case of the MWMP, the underlying conditions that can support wetlands (e.g., drainage topography, water source, buffer conditions) still remain after maintenance/repair occur and, therefore, the area maintained will likely continue

to provide wetland functions. Nonetheless, the MWMP includes compensatory biological mitigation at the full ratios used for all types of development.

In addition, the MWMP includes water quality measures that provide mitigation to address the temporal loss of wetlands and associated significant and unavoidable long-term water quality impacts resulting from facility maintenance when compensatory biological mitigation has not been constructed by the time that maintenance has been completed.

Maintenance proposed at the 10 structural facility group FMPs and non-jurisdictional (i.e., isolated) basins that do not flow directly to downstream waters (e.g., Miramar-Engineer and Tijuana River-Siempre Viva facility groups) would have limited long-term water quality impacts due to limited wetlands vegetation loss and/or limited capacity for adverse downstream effects, and therefore would not require implementation of water quality mitigation measures.

In addition to the wetland mitigation that would still be provided, proposed MWMP water quality mitigation includes three, equally suitable activities: (1) maintenance-specific outreach and enhanced catch basin cleaning, (2) enhanced street sweeping, and/or (3) select “green” infrastructure (GI) (Table 3-1). Within the context of the MWMP, GI can potentially include low-impact-development type BMPs, multi-use treatment areas (MUTA), or stream rehabilitation projects. The proposed water quality activities were selected based on multiple criteria, including pollutant removal efficiency, implementation-time schedule and level of complexity, and City operational capacity. A model-based methodology was used to derive the activity type and quantity of proposed water quality mitigation measure.

Table 3-1
Municipal Waterways Maintenance Plan Additional Beneficial Water Quality Activities

Item[1]	Activity[2]	Implementation Quantity[3]	Implementation Detail
1	Maintenance-specific outreach	250 units[4]	Per maintenance event
	Enhanced in-watershed catch basin inspection and cleaning	25 locations[5]	Quarterly inspection and cleaning for 1 year per maintenance event
2	Enhanced street sweeping	1 mile[6]	Per 5 linear feet of wetland impact
3	GI-MUTA-stream rehabilitation	1 project[7]	Per facility maintained

GI = green infrastructure; MUTA = multi-use treatment area

1 Under the MWMP, the City's Transportation & Storm Water Department (TSW) would implement one of three, equally suitable water-quality activities for each facility group maintained where mitigation is not yet constructed. Items 1 or 2 would be implemented each fiscal year that maintenance occurs. Item 3 would be implemented once, and no additional water-quality-benefit features would be required.

2 Beneficial water-quality-activity implementation is specific to the MWMP program. Activities are not included as part of the City *Water Quality Improvement Plan* or other compliance efforts.

3 Calculation-based methodology applied to derive beneficial water-quality-activity implementation quantities.

4 250 in-watershed parcels.

5 25 in-watershed catch basin locations inspected and cleaned quarterly for one fiscal year.

6 1 mile additional in-watershed vacuum-assisted and/or median street sweeping effort per 5 linear feet of wetland impact within the fiscal year when maintenance occurs.

7 One in-watershed GI-MUTA-stream rehabilitation project 500 square feet or greater as implemented by the TSW. GI-MUTA-stream rehabilitation projects greater than 1,000 square feet may be used for multiple facilities and maintenance events.

When applicable, items 1 or 2 shall be implemented each fiscal year that maintenance occurs. Item 3 shall be implemented once, and no additional water quality mitigation would be required. Implementation of Items 1, 2, or 3 is independent of required compensatory habitat mitigation to be performed as part of MM-BIO-1a.

Beneficial Water Quality Activity Quantitative Information

The objective of this section is to present scientific and factual evidence to support the proposed beneficial water quality activities to address significant and unavoidable water quality impacts. The level of implementation and additional water quality benefit of the proposed activities were developed using an impact-based approach and modeled pollutant load reductions for selected

beneficial water quality activities to estimate pollutant reductions based on available data. A summary of supporting quantitative information is presented below.

Representative Facilities. Four representative MWMP facilities distributed in the Mission Bay WMA (two facilities), San Diego Bay WMA, and Los Peñasquitos WMA were used to estimate water quality activity effectiveness. Drainage area size for the four representative facilities ranged from 124 to 1,700 acres. Estimated wetland impact in the facilities resulting from MWMP maintenance activities ranged from 450 to 1,050 linear feet.

Baseline Drainage Area Pollutant Load. A watershed model was used to estimate potential pollutant load to the representative facilities from upstream drainage areas (RWQCB 2013). The model used site-specific hydrology and hydraulic information derived from the MWMP *Hydrology and Hydraulics Technical Report* (City of San Diego 2019b) for the four representative locations. The model method includes land-use based runoff coefficients, representative pollutant concentrations, and annual rainfall data. Baseline pollutant load estimates were based an annual wet-season storm volume.

Activity – Maintenance-Specific Outreach. Available research indicates that nonstructural strategies may be anticipated to produce a wide range of pollutant load reduction (City of San Diego 2014b). Factors influencing nonstructural strategy results include the level of control the City has over the strategy, and the behavioral constructs that are affected by the outreach campaigns (e.g., guilt, social norms). For the purposes of the MWMP, maintenance-specific outreach is assumed to result in a 10% load removal of certain constituents, including bacteria, metals, organics, sediment, pesticides, nutrients, oil and grease, dissolved minerals, and trash (City of San Diego 2014b).

Activity – Enhanced In-Watershed Catch Basin Inspection and Cleaning. A combination of City ongoing maintenance and pilot study data was used to model the relative water quality benefit of enhanced catch basin inspection and cleaning. Model assumptions included approximately 50 pounds of debris removed per catch basin cleaning event, measured pilot study pollutant concentrations, trash comprises approximately 25% to 50% of removed debris (City of San Diego 2012a, 2012b). Model results indicated that implementation of 25 enhanced in-watershed catch basin inspection and cleaning events would provide pollutant reductions that range from less than 1% to 6% of representative facility calculated baseline metals constituent (copper, lead, and zinc) loads. Additional benefits to water quality resulting from removal of trash pollutants is assumed but was not calculated based on available data limitations. The MWMP water quality mitigation measure includes 25 enhanced in-watershed catch basin inspection and cleaning events implemented quarterly for one fiscal year for each maintained channel.

Activity – Enhanced In-Watershed Street Sweeping. A combination of City ongoing maintenance and pilot study data was used to model the relative water quality benefit of enhanced street

sweeping. Model assumptions included approximately 130 pounds of debris removed per broom mile of sweeping, measured pilot study metals pollutant concentrations are representative, and trash comprises approximately 25% to 50% of removed debris (City of San Diego 2015). Model results indicated that implementation of enhanced in-watershed street sweeping at a frequency of 1 mile per 5 linear feet of wetland impact would equate to between 90 and 210 miles of additional annual sweeping for the representative facilities. Associated metals constituent (copper, lead, and zinc) load reductions were modeled to range from 3% to 10%, with isolated greater potential load reductions, of representative facility baseline loads. In areas with greater wetland impacts but smaller watersheds, model results indicated that the relative benefit of the enhanced in-watershed street sweeping may provide 60% to 100% reduction of representative facility baseline loads for metals constituents (copper, lead, and zinc).

Activity – GI-MUTA-Stream Rehabilitation. A combination of regulatory requirement information, peer-reviewed literature, and ongoing City comprehensive master planning efforts was used to estimate pollutant load reductions associated with GI-MUTA-stream rehabilitation project implementation (RWQCB 2013; San Diego Regional Copermittees 2018; Water Research Foundation 2019). GI-MUTA-stream rehabilitation projects may use interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged to and from the MS4. Dynamic variables, including inflow concentrations and flow rates, media properties, and configuration, can account for significant variability in percent pollutant reduction and performance. Representative literature indicates that distributed GI-MUTA-stream rehabilitation projects may provide approximately 10% to 70% removal of influent pollutant constituents (TSS, nutrients, copper, lead, and zinc) loads (San Diego Regional Copermittees 2018).

Quantitative information was used to develop the proposed level of implementation of water quality activities. For channel/ditch and basin facilities where maintenance activities result in jurisdictional vegetated wetlands loss, and compensatory mitigation has yet to be constructed at the time maintenance has been completed, one of three, equally suitable beneficial water quality activities would be implemented for each facility group maintained (Table 3-1). Items 1 or 2 would be implemented each fiscal year that maintenance occurs. Item 3 would be implemented once, and no additional water quality activities would be required. GI projects require detailed planning, design, and construction, limiting implementation feasibility within the anticipated MWMP term. However, where opportunities for implementation of GI, MUTA, or stream rehabilitation projects exist, they would be prioritized in coordination with City Watershed Master Plans and WQIPs.

In deriving the proposed beneficial water quality activities, a suite of other potential water quality enhancement features was evaluated to determine applicability to the MWMP and feasibility to

provide quantitative estimation of pollutant load reductions. Examples of evaluated potential water quality enhancement features include municipal and private property erosion and slope stabilization, proactive storm drain asset repairs, landscape retrofits, and California Rapid Assessment Method (CRAM) monitoring. In general, activities with limited available data to allow for quantitative information to evaluate potential pollutant load reductions were not selected as part of the MWMP. The City continues to perform these water quality enhancement features and other activities that were not selected as MWMP additional beneficial water quality activities as part of its JRMP (City of San Diego 2018c) and other associated programs.

Water Quality Impact Approach Summary

The City's MWMP approach to address water quality impacts includes avoidance as a primary component by providing project-level analysis. Where required based on biological resource mitigation measures and/or regulatory permits, compensatory wetlands mitigation would provide replacement of wetlands areas and function at established ratios to offset unavoidable wetland impacts, including associated assimilative capacity losses. For those projects that have wetlands loss, and compensatory mitigation has yet to be constructed at the time maintenance has been completed, the City is proposing water quality activities that provide quantitative estimates of pollutant load reductions. The long-term City approach is to equitably balance short-term application of proposed additional water quality activities that provide quantitative estimates of pollutant load reductions with long-term compensatory mitigation and completion of GI, MUTA, and/or stream rehabilitation projects to help offset potentially significant long-term water quality impacts.

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4 RESULTS

The results of the water quality evaluation of MWMP channel/ditch and basin facilities FMPs proposed for maintenance and related water quality protections are summarized in Table 4-1. The water quality evaluation includes facility-specific analysis outcomes for adherence to the City's Storm Water Standards Manual (City of San Diego 2018a) and application of water quality mitigation.

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Table 4-1
MWMP Facilities Water Quality Evaluation Summary

Facility Number	Facility Group Name[1]	Segment Name	Segment Number	303(d) Listed (Facility or 1st Downstream Reach)	Adopted TMDL	Sediment/ Related Condition HPWQC for WMA	Environmentally/ Water Quality Sensitive Area, including Environmentally Sensitive Lands	Compensatory Wetlands Mitigation Constructed[2]	Expected to Result in Vegetation, Jurisdictional Wetland Loss[2]	Water Quality Mitigation (1 of 3 Beneficial Activities) May Apply
1-04-030	Green Valley Creek - Pomerado	Pomerado	1	Yes	Yes	No	Yes	No	Yes	Yes
1-04-033	Green Valley Creek - Pomerado	Pomerado	2	Yes	Yes	No	Yes	No	Yes	Yes
1-04-200	Green Valley Creek - Paseo del Verano	Paseo del Verano	1	Yes	Yes	No	Yes	No	Yes	Yes
2-01-120	Los Peñasquitos Lagoon - Industrial	Industrial	1	Yes	Yes	Yes	Yes	No	Yes	Yes
2-01-122	Los Peñasquitos Lagoon - Industrial	Industrial	2	Yes	Yes	Yes	Yes	Yes	N/A	No
2-01-130	Los Peñasquitos Lagoon - Tripp	Tripp	1	Yes	Yes	Yes	Yes	Yes	N/A	No
2-01-200	Los Peñasquitos Canyon Creek - Black Mountain	Black Mountain	1	Yes	Yes	Yes	Yes	No	Yes	Yes
2-01-210	Los Peñasquitos Canyon Creek - Black Mountain	Black Mountain	2	Yes	Yes	Yes	Yes	No	Yes	Yes
2-01-900	Los Peñasquitos Canyon Creek - 5-805 Basin	5-805 Fwys	1	Yes	Yes	Yes	Yes	Yes	N/A	No
2-03-000	Soledad Canyon Creek - Sorrento	Roselle	1	Yes	Yes	Yes	Yes	Yes	N/A	No
2-03-002	Soledad Canyon Creek - Sorrento	Roselle	2	Yes	Yes	Yes	Yes	Yes	N/A	No
2-03-012	Carroll Canyon Creek - Carroll	Carroll Canyon	1	Yes	Yes	Yes	Yes	No	No	No
2-03-100	Soledad Canyon Creek - Flintkote	Flintkote	1	Yes	Yes	Yes	Yes	Yes	N/A	No
2-03-150	Soledad Canyon Creek - Dunhill	Dunhill	1	Yes	Yes	Yes	Yes	No	Yes	Yes
2-05-140	Chicarita Creek - Via San Marco	Via San Marco	1	No	Yes	Yes	No	No	No	No
3-00-120	Torrey Pines - Torrey	Torrey Pines	1	No	No	No	No	No	No	No

Table 4-1
MWMP Facilities Water Quality Evaluation Summary

Facility Number	Facility Group Name[1]	Segment Name	Segment Number	303(d) Listed (Facility or 1st Downstream Reach)	Adopted TMDL	Sediment/ Related Condition HPWQC for WMA	Environmentally/ Water Quality Sensitive Area, including Environmentally Sensitive Lands	Compensatory Wetlands Mitigation Constructed[2]	Expected to Result in Vegetation, Jurisdictional Wetland Loss[2]	Water Quality Mitigation (1 of 3 Beneficial Activities) May Apply
3-00-150	Alta La Jolla - Vickie	Vickie	1	No	Yes	No	No	Yes	N/A	No
3-02-101	Mission Bay - MBHS	PB-Olney	1	Yes	No	No	Yes	Yes	N/A	No
3-02-103	Mission Bay - MBHS	MBHS	1	Yes	No	No	Yes	Yes	N/A	No
3-02-130	Mission Bay - Mission Bay Drive	Mission Bay Drive	1	Yes	No	No	Yes	No	Yes	Yes
3-03-901	Miramar - Engineer	Engineer	1	Yes	Yes	No	Yes	No	No	No
3-04-055	Tecolote Creek - Chateau	Chateau	1	Yes	Yes	No	Yes	No	No	No
3-04-250	Tecolote Creek - Chateau	Chateau	2	Yes	Yes	No	Yes	No	No	No
3-04-160	Tecolote Creek - Genesee	Genesee	1	Yes	Yes	No	Yes	No	Yes	Yes
4-01-103	San Diego River - Nimitz	Nimitz	1	Yes	Yes	No	Yes	No	No	No
4-01-105	San Diego River - Nimitz	Nimitz	2	Yes	Yes	No	Yes	No	No	No
4-01-107	San Diego River - Nimitz	Nimitz	3	Yes	Yes	No	Yes	No	No	No
4-01-120	San Diego River - Valeta	Valeta	1	Yes	Yes	No	Yes	No	Yes	Yes
4-03-101	San Diego River - Camino del Rio	Camino del Arroyo	1	Yes	Yes	No	Yes	No	Yes	Yes
4-03-103	San Diego River - Camino del Rio	Camino del Rio	1	Yes	Yes	No	Yes	No	Yes	Yes
4-04-000	Murphy Canyon Creek - Stadium	Stadium	1	Yes	Yes	No	Yes	Yes	N/A	No
4-04-002	Murphy Canyon Creek - Stadium	Stadium	2	Yes	Yes	No	Yes	Yes	N/A	No
4-04-006	Murphy Canyon Creek - Stadium	Murphy Canyon	1	Yes	Yes	No	Yes	No	No	No
4-07-002	Alvarado Canyon Creek - Mission Gorge	Mission Gorge	1	Yes	Yes	No	Yes	Yes	N/A	No
4-07-004	Alvarado Canyon Creek - Mission Gorge	Mission Gorge	2	Yes	Yes	No	Yes	Yes	N/A	No

Table 4-1
MWMP Facilities Water Quality Evaluation Summary

Facility Number	Facility Group Name[1]	Segment Name	Segment Number	303(d) Listed (Facility or 1st Downstream Reach)	Adopted TMDL	Sediment/ Related Condition HPWQC for WMA	Environmentally/ Water Quality Sensitive Area, including Environmentally Sensitive Lands	Compensatory Wetlands Mitigation Constructed[2]	Expected to Result in Vegetation, Jurisdictional Wetland Loss[2]	Water Quality Mitigation (1 of 3 Beneficial Activities) May Apply
4-07-009	Alvarado Canyon Creek - Mission Gorge	Mission Gorge	3	Yes	Yes	No	Yes	No	Yes	Yes
4-07-011	Alvarado Canyon Creek - Mission Gorge	Mission Gorge	4	Yes	Yes	No	Yes	No	No	No
4-07-021	Alvarado Canyon Creek - Alvarado	Alvarado	1	Yes	Yes	No	Yes	Yes	N/A	No
4-07-023	Alvarado Canyon Creek - Alvarado	Alvarado	2	Yes	Yes	No	Yes	No	No	No
4-07-250	Alvarado Canyon Creek - Alvarado	Alvarado	3	Yes	Yes	No	Yes	No	No	No
4-07-901	Murray Reservoir - Cowles Mountain	Cowles Mountain	1	Yes	Yes	No	Yes	No	Yes	Yes
4-07-911	Murray Reservoir - Cowles Mountain	Cowles Mountain	2	Yes	Yes	No	Yes	No	No	No
4-08-008	Norfolk Canyon Creek - Fairmount	Fairmount	1	Yes	Yes	No	Yes	No	No	No
4-08-011	Norfolk Canyon Creek - Fairmount	Fairmount	2	Yes	Yes	No	Yes	No	No	No
4-08-014	Norfolk Canyon Creek - Fairmount	Fairmount	3	Yes	Yes	No	Yes	No	No	No
4-08-017	Norfolk Canyon Creek - Fairmount	Fairmount	4	Yes	Yes	No	Yes	No	Yes	Yes
4-08-150	Norfolk Canyon Creek - Fairmount	Baja	1	Yes	Yes	No	Yes	Yes	N/A	No
5-02-140	Maple Canyon Creek - Maple	Maple	1	No	No	No	Yes	No	No	No
5-02-151	Washington Canyon Creek - Washington	Washington	1	Yes	No	No	Yes	No	No	No
5-02-153	Washington Canyon Creek - Washington	Washington	2	Yes	No	No	Yes	No	No	No

Table 4-1
MWMP Facilities Water Quality Evaluation Summary

Facility Number	Facility Group Name[1]	Segment Name	Segment Number	303(d) Listed (Facility or 1st Downstream Reach)	Adopted TMDL	Sediment/ Related Condition HPWQC for WMA	Environmentally/ Water Quality Sensitive Area, including Environmentally Sensitive Lands	Compensatory Wetlands Mitigation Constructed[2]	Expected to Result in Vegetation, Jurisdictional Wetland Loss[2]	Water Quality Mitigation (1 of 3 Beneficial Activities) May Apply
5-02-162	Mission Hills Canyon Creek - Titus	Titus	1	Yes	No	No	Yes	No	No	No
5-03-011	Powerhouse Canyon Creek - Pershing	Pershing	1	No	Yes	No	Yes	No	Yes	Yes
5-03-100	Powerhouse Canyon Creek - Pershing	Pershing	2	No	Yes	No	Yes	No	Yes	Yes
5-03-901	San Diego Bay - 28th St	28th St	1	Yes	Yes	No	Yes	No	Yes	Yes
5-04-004	Chollas Creek - National	National	1	Yes	Yes	No	Yes	No	No	No
5-04-006	Chollas Creek - National	National	2	Yes	Yes	No	Yes	No	No	No
5-04-044	Chollas Creek - Rolando	Cartagena	1	Yes	Yes	No	Yes	No	No	No
5-04-046	Chollas Creek - Rolando	Rolando	1	No	Yes	No	No	No	No	No
5-04-048	Chollas Creek - Rolando	Rolando	2	No	Yes	No	No	No	Yes	Yes
5-04-101	Chollas Creek - Martin	Martin	1	Yes	Yes	No	Yes	No	Yes	Yes
5-04-163	Chollas Creek - J St	J St	1	Yes	Yes	No	Yes	No	No	No
5-04-220	Auburn Creek - Home	Home	1	Yes	Yes	No	Yes	No	Yes	Yes
5-04-224	Auburn Creek - Home	Home	2	Yes	Yes	No	Yes	No	No	No
5-04-227	Auburn Creek - Home	Home	3	Yes	Yes	No	Yes	No	No	No
5-04-231	Auburn Creek - Home	Home	5	Yes	Yes	No	Yes	No	No	No
5-04-239	Auburn Creek - Wightman	Wightman	1	No	Yes	No	No	No	No	No
5-04-241	Auburn Creek - Wightman	Wightman	2	No	Yes	No	No	No	No	No
5-04-260	Chollas Creek - Megan	Megan	1	Yes	Yes	No	Yes	No	Yes	Yes
5-04-262	Chollas Creek - Megan	Megan	2	Yes	Yes	No	Yes	No	No	No
5-04-280	Chollas Creek - 54th St	54th St	1	Yes	Yes	No	Yes	No	Yes	Yes
5-05-006	South Chollas Creek - Southcrest	Alpha	1	Yes	Yes	No	Yes	No	Yes	Yes
5-05-008	South Chollas Creek - Southcrest	Ocean View	1	Yes	Yes	No	Yes	No	Yes	Yes

Table 4-1
MWMP Facilities Water Quality Evaluation Summary

Facility Number	Facility Group Name[1]	Segment Name	Segment Number	303(d) Listed (Facility or 1st Downstream Reach)	Adopted TMDL	Sediment/ Related Condition HPWQC for WMA	Environmentally/ Water Quality Sensitive Area, including Environmentally Sensitive Lands	Compensatory Wetlands Mitigation Constructed[2]	Expected to Result in Vegetation, Jurisdictional Wetland Loss[2]	Water Quality Mitigation (1 of 3 Beneficial Activities) May Apply
5-05-021	South Chollas Creek - Euclid	Euclid	2	Yes	Yes	No	Yes	No	No	No
5-05-035	South Chollas Creek - Federal	Federal	1	Yes	Yes	No	Yes	Yes	N/A	No
5-05-037	South Chollas Creek - Federal	Federal	2	Yes	Yes	No	Yes	Yes	N/A	No
5-05-205	South Chollas Creek Encanto Branch - Castana	Castana	1	No	Yes	No	Yes	No	No	No
5-05-306	South Chollas Creek Encanto Branch - Imperial	Imperial	2	Yes	Yes	No	Yes	No	No	No
5-05-603	South Chollas Creek Encanto Branch - Jamacha	Jamacha	1	Yes	Yes	No	Yes	No	No	No
5-06-005	Paleta Creek - Cottonwood	Cottonwood	1	Yes	No	No	Yes	No	No	No
5-06-008	Paleta Creek - Cottonwood	Cottonwood	2	Yes	No	No	Yes	No	No	No
5-06-020	Paleta Creek - Solola	Solola	1	Yes	No	No	Yes	No	No	No
5-06-023	Paleta Creek - Solola	Solola	2	Yes	No	No	Yes	No	No	No
5-11-003	Sweetwater River - Parkside	Parkside	1	Yes	No	No	Yes	No	No	No
5-22-008	Nestor Creek - Nestor	Cedar	1	No	No	No	No	No	No	No
5-22-010	Nestor Creek - Nestor	Cedar	2	No	No	No	No	No	Yes	Yes
5-22-013	Nestor Creek - Nestor	Dahlia	1	No	No	No	No	No	No	No
5-22-016	Nestor Creek - Nestor	Cerissa	1	No	No	No	No	No	Yes	Yes
5-22-023	Nestor Creek - Nestor	Grove	1	No	No	No	No	No	Yes	Yes
5-22-028	Nestor Creek - Nestor	30th St	1	No	No	No	No	No	Yes	Yes
5-22-110	Nestor Creek - Outer	Outer	1	No	No	No	No	No	Yes	Yes
5-22-112	Nestor Creek - Outer	Outer	2	No	No	No	No	No	No	No

Table 4-1
MWMP Facilities Water Quality Evaluation Summary

Facility Number	Facility Group Name[1]	Segment Name	Segment Number	303(d) Listed (Facility or 1st Downstream Reach)	Adopted TMDL	Sediment/ Related Condition HPWQC for WMA	Environmentally/ Water Quality Sensitive Area, including Environmentally Sensitive Lands	Compensatory Wetlands Mitigation Constructed[2]	Expected to Result in Vegetation, Jurisdictional Wetland Loss[2]	Water Quality Mitigation (1 of 3 Beneficial Activities) May Apply
6-01-020	Tijuana River - Pilot & Smuggler's	Pilot Channel	1	Yes	No	Yes	Yes	Yes	N/A	No
6-01-100	Tijuana River - Pilot & Smuggler's	Smuggler's Gulch	1	Yes	No	Yes	Yes	Yes	N/A	No
6-02-118	Tijuana River - Tocayo	Tocayo	2	Yes	No	Yes	Yes	No	Yes	Yes
6-03-138	Tijuana River - Smythe	Via Encantadoras	1	Yes	No	Yes	Yes	No	Yes	Yes
6-03-138	Tijuana River - Smythe	Via Encantadoras	2	Yes	No	Yes	Yes	No	No	No
6-03-143	Tijuana River - Smythe	Via Encantadoras	3	Yes	No	Yes	Yes	No	Yes	Yes
6-03-147	Tijuana River - Smythe	Smythe	1	Yes	No	Yes	Yes	No	Yes	Yes
6-03-150	Tijuana River - Smythe	Via de la Bandola	1	Yes	No	Yes	Yes	No	Yes	Yes
6-04-251	Spring Canyon Creek – Cactus	Cactus	1	Yes	No	Yes	Yes	No	No	No
6-04-253	Spring Canyon Creek - Cactus	Cactus	2	Yes	No	Yes	Yes	No	No	No
6-05-110	Tijuana River - Siempre Viva	Siempre Viva	1	Yes	No	Yes	Yes	No	No	No
6-06-011	Tijuana River - La Media	La Media	1	Yes	No	Yes	Yes	No	Yes	Yes

1. Structures are not included in this table because maintenance is not anticipated to have significant water quality impacts.
2. Information based on latest *Biological Resources Technical Report* and excludes non-jurisdictional wetlands (e.g., isolated basins).

TMDL = total maximum daily load; HPWQC = Highest Priority Water Quality Conditions; MBHS = Mission Bay High School; PB = Pacific Beach

5 USE OF WATER QUALITY EVALUATION RESULTS

This section describes how results of the water quality evaluation may be used to support environmental impacts analysis associated with MWMP. In general, potential significant impacts to water quality may occur if facility maintenance activities would result in a substantial, or potentially substantial, adverse change in the water quality conditions within the area affected by maintenance. Potential significant impacts to water quality may occur if maintenance would result in a violation of water quality standards or substantial degradation of water quality or substantial adverse water quality effects. Guidelines used to support water quality environmental impact analysis include the City's California Environmental Quality Act Significance Determination Thresholds (City of San Diego 2016) and Appendix G of California Environmental Quality Act Guidelines (14 CCR 15000 et seq.).

Compiled data and information may be used to address the following:

- Would the project adhere to the City's Storm Water Standards Manual (City of San Diego 2018a)?
- Would the project otherwise substantially degrade water quality?

The results of the facility-specific water quality evaluation presented in this *Water Quality Technical Analysis Report* can be used to support the evaluation of potentially significant impacts related to increased pollutant discharges, violation of water quality standards/WDRs, and substantial degradation of water quality resulting from facility maintenance activities in the environmental impacts analysis. Information related to existing water quality in the MWMP facilities is contained in Sections 2 and 4 of this report. Information related to the methodology used to evaluate the potential for MWMP maintenance activities to significantly impact existing water quality conditions is discussed in Section 3.

Section 4 contains facility-specific water quality information assessed within the context of the specific maintenance activities being performed. Section 4 identifies facilities that meet the criteria for mitigation of long-term water quality impacts under the water quality mitigation framework and require implementation of additional MWMP water quality activities.

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CITY OF SAN DIEGO WATERSHED MANAGEMENT AREA (WMA) SUMMARIES

I. SAN DIEGUITO RIVER WMA

The San Dieguito River WMA encompasses 346 square miles, with approximately 43 square miles in the City's jurisdiction. The San Dieguito River WMA extends from the Volcan Mountains in the east to the San Dieguito Lagoon and Pacific Ocean in the west. It lies in the central western portion of San Diego County, and is the northernmost WMA in the MWMP proposed maintenance area. The San Dieguito WMA neighbors the Los Peñasquitos and San Diego WMAs to the south. Rainfall to the area drains east to west through the San Dieguito River. Runoff discharges into Lake Hodges and San Dieguito Lagoon, which then leads to the Pacific Ocean near the communities of Del Mar and Solana Beach. The San Pasqual Academy Wastewater Treatment Plant contributes to the flow of the main rivers and creeks.

Communities within the San Dieguito River WMA receive potable water from several reservoirs including Lake Hodges and Sutherland Reservoir. Approximately 63% of the land is currently undeveloped or designated as open space.

A summary of WMA community and land use information is provided in Table A-1. A summary of the HPWQCs, goals and strategies identified in the WQIP for the San Dieguito River WMA are also included in the table.

Table A-1
San Dieguito River WMA and WQIP Summary Information

San Dieguito River WMA	
WMA Size	346 square miles
Approximate Population	178,000
Communities	• Del Mar • Solana Beach • Fairbanks Ranch • Rancho Peñasquitos • Rancho Bernardo • Del Dios • Poway • San Pasqual • Ramona

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Table A-1
San Dieguito River WMA and WQIP Summary Information

San Dieguito River WMA	
	• Santa Ysabel
Responsible Agencies	• City of Del Mar • City of Escondido • City of Poway • City of San Diego • City of Solana Beach • County of San Diego
Land Use	Vacant or Undeveloped (39%, Open Space or Recreation (24%); Residential (18%); Agriculture (14%); Freeway, Road or Transportation (3%), Water (<1%), Office (<1%), Commercial (<1%), and Industrial (<1%)
WQIP HPWQC	• Indicator bacteria along the Pacific Ocean at the San Dieguito Lagoon Mouth from areas above Lake Hodges when rainfall causes the Lake Hodges dam to overflow. • Indicator bacteria along the Pacific Ocean at the San Dieguito Lagoon Mouth as measured during both wet and dry weather.
WQIP Goals	• Prevent further degradation of water quality in the San Dieguito River WMA and subwatersheds to protect creeks and beaches from pollution. • Reduce bacteria levels at the Pacific Shoreline (by FY 2021 for dry weather and by FY 2031 for wet weather).
WQIP Strategies	Including, but not limited to: • Stream and beach cleanups • Green infrastructure projects • Outreach and education

II. LOS PEÑASQUITOS WMA

The Los Peñasquitos WMA encompasses 94 square miles, with approximately 65 square miles in the City's jurisdiction. The Los Peñasquitos WMA begins near the City of Poway in the east and drains west to the Los Peñasquitos Lagoon and Pacific Ocean. The Los Peñasquitos WMA lies in central San

Diego County with the San Dieguito River WMA to the north and the Mission Bay and San Diego River WMAs to the south. Small finger canyons drain into three main creeks (Carmel Valley Creek, Los Peñasquitos Creek, and Carroll Canyon Creek) that lead into the Los Peñasquitos Lagoon and ultimately the Pacific Ocean near the community of Del Mar. The North City Water Reclamation Plant contributes to the flow of the main rivers and creeks.

Potable water for local use is drawn from the Los Peñasquitos WMA at the Miramar Reservoir. A summary of WMA community and land use information is provided in Table A-2. Approximately 46% of the land is currently undeveloped or designated as open space. A summary of HPWQCs, goals and strategies identified in the WQIP for the Los Peñasquitos WMA are also included in the table.

Table A-2
Los Peñasquitos WMA and WQIP Summary Information

Los Peñasquitos WMA	
Size (square miles)	94 square miles
Approximate Population	260,000
Communities	• Torrey Pines • Del Mar • Carmel Valley • Sorrento Valley • Mira Mesa • Rancho Peñasquitos • Carmel Mountain • Sabre Springs • Poway
Responsible Agencies	• City of Del Mar • City of San Diego • County of San Diego • California Department of Transportation (Caltrans; voluntary participant)
Land Use	Open Space (33%); Residential (27%); Vacant or Undeveloped (13%); Freeways, Roads, or Transportation (12%), Industrial or Office (11%); Commercial (2%), Agriculture (<1%), or Water (<1%)
WQIP HPWQCs	• Freshwater discharges during dry weather into the Los Peñasquitos Lagoon.

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Table A-2
Los Peñasquitos WMA and WQIP Summary Information

Los Peñasquitos WMA	
	• Transport of sediment from upstream sources (current and historical) during rain events into the Los Peñasquitos Lagoon. • Indicator bacteria as measured during both wet and dry weather at Torrey Pines State Beach near the Los Peñasquitos Lagoon mouth.
WQIP Goals	• Maintain water quality in the Los Peñasquitos WMA and subwatersheds to protect creeks and beaches from pollution. • Reduce bacteria levels at the Pacific Shoreline near Torrey Pines State Beach (by FY 2021 for dry weather and by FY 2031 for wet weather). • Reduce sediment inputs and freshwater discharges to the Los Peñasquitos Lagoon by FY 2035, to allow significant restoration of the Los Peñasquitos Lagoon.
WQIP Strategies	Including, but not limited to: • Enhanced street sweeping and catch basin cleaning • Stream and beach cleanups • Green infrastructure projects • Participating in Los Peñasquitos Lagoon restoration efforts.

III. MISSION BAY WMA

The Mission Bay WMA encompasses 64 square miles, with approximately 62 square miles in the City's jurisdiction. The Mission Bay WMA begins east of the I-15 in central San Diego County and drains west to Mission Bay. The Los Peñasquitos WMA lies to the north and San Diego River WMA to the south. Rose Canyon, San Clemente Canyon, Tecolote Creek, and smaller canyons carry runoff downstream to Mission Bay and the Pacific Ocean. Rose Creek was diverted east and channelized in the first half of the 20th century. The San Diego Marine Life Refuge Area of Special Biological Significance (ASBS) is located downstream of this WMA.

A summary of WMA community and land use information is provided in Table A-3. Approximately 38% of the land is currently undeveloped or designated as open space. HPWQCs, goals and strategies identified in the Mission Bay WQIP are also included in the table.

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Table A-3
Mission Bay WMA and WQIP Summary Information

Mission Bay WMA	
Size (square miles)	64 square miles
Approximate Population	232,000
Communities	• La Jolla • Pacific Beach • University City • Clairemont Mesa • Miramar
Responsible Agencies	• City of San Diego • Caltrans (Voluntary participant)
Land Use	Open Space (31%); Residential (28%); Freeways, Roads, or Transportation (16%); Industrial or Office (11%); Vacant or Undeveloped (7%); Industrial (3%); Commercial (3%); Agriculture (<1%), or Water (<1%)
WQIP HPWQCs	• High bacteria levels in creeks, including Tecolote Creek. • Bacteria concentrations as measured during both wet and dry weather at beaches, including La Jolla, Pacific Beach, and Windansea Beach. • Erosion and transport of soil and sediment into the San Diego Marine Life Refuge Area of Special Biological Significance (ASBS) located downstream of this WMA. Per the Basin Plan, discharges of wastewater and/or heat must be sufficiently removed spatially from these areas to assure the maintenance of natural water quality conditions in these areas.
WQIP Goals	• Prevent further degradation of water quality in the Mission Bay WMA and subwatersheds to protect creeks and beaches from pollution. • Reduce bacteria levels in Tecolote Creek (by FY 2021 for dry weather and by FY 2031 for wet weather).
WQIP Strategies	Including, but not limited to: • Performing regular storm water compliance inspections within areas draining to ASBS • Installing dry weather flow diversions • Green infrastructure projects

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IV. SAN DIEGO RIVER WMA

The San Diego River WMA encompasses 434 square miles in central San Diego County, with approximately 73 square miles in the City's jurisdiction. The Los Peñasquitos and San Dieguito WMAs lie to the north, and the San Diego Bay WMA to the south. The San Diego River originates in the Cuyamaca Mountains near Santa Ysabel, over 6,000 feet above sea level along the western border of the Anza Borrego Desert State Park, and extends more than 52 miles across central San Diego County. The river traverses Mission Valley and ultimately discharges into the Pacific Ocean in Ocean Beach, a community within the City of San Diego. The San Diego River was altered to its present course in 1977 by the introduction of a dam and the straightening of the channel to the ocean.

The San Diego River WMA is the most populated of the WMAs, with the majority of the population and development occurring in the lower watershed. Potable water for local use is drawn from Lake Murray, Lake Jennings, San Vicente, El Capitan and Cuyamaca Reservoirs. A summary of WMA community and land use information is provided in Table A-4. Approximately 67% of the land is currently undeveloped or designated as open space. HPWQCs, goals and strategies identified in the San Diego River WQIP are also included in the table.

Table A-4
San Diego River WMA and WQIP Summary Information

San Diego River WMA	
Size (square miles)	434 square miles
Approximate Population	520,000
Responsible Agencies	• City of El Cajon • City of La Mesa • City of San Diego • City of Santee • County of San Diego • Caltrans (Voluntary participant)
Land Use	Vacant or Undeveloped (44%); Open Space or Park and Recreation (23%); Residential and Spaced Rural Residential (19%); Transportation (6%); Agriculture (<2%), Commercial (<2%), Commercial Recreation (<2%), Industrial (<2%), Military (<2%), Public Facility (<2%), or Water (<2%)
WQIP HPWQCs	• Bacteria in the Lower San Diego River Watershed.

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Table A-4
San Diego River WMA and WQIP Summary Information

San Diego River WMA	
WQIP Goals	• Protect human health by implementing programs and practices designed to meet interim and final Bacteria TMDL targets for dry and wet weather (by FY 2021 for dry weather and by FY 2031 for wet weather).
WQIP Strategies	Including, but not limited to: • Installing automatic flow meters in outlets with persistent non-storm-water discharges to help identify sources • Trash cleanups in receiving water bodies • Habitat restoration • Green infrastructure projects • Investigating and eliminating wastewater system discharges to the storm drain system • Participation in Surfer Health Study (Schiff, Griffith, Steele, et al. 2016)

V. SAN DIEGO BAY WMA

The San Diego Bay WMA encompasses 444 square miles, with approximately 60 square miles in the City's jurisdiction. The San Diego Bay WMA begins approximately 6,000 feet above sea level in the Laguna Mountains to the east and draining more than 50 miles west to San Diego Bay and the Pacific Ocean. The San Diego Bay WMA is the largest in San Diego County, and neighbors the San Diego River WMA to the north and the Tijuana River WMA to the south. The San Diego Bay WMA contains three HUs: Pueblo San Diego, Sweetwater River, and Otay River. Though each is a functionally distinct watershed, all discharge to San Diego Bay and thus are grouped as one WMA. Rainfall to the area drains through an assortment of creeks and tributaries that drains to the San Diego Bay. The Point Loma Wastewater Treatment Plant and the Descanso Detention Facility Wastewater Treatment Plant contribute to the flow of the main rivers and creeks.

Potable water for local use is drawn from Chollas Lake, Sweetwater, Loveland, and Upper and Lower Otay Reservoirs. A summary of WMA community and land use information is provided in Table A-5. Approximately 58% of the land is currently undeveloped. HPWQCs, goals and strategies identified in the San Diego Bay WQIP are also included in the table.

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Table A-5
San Diego Bay WMA and WQIP Summary Information

San Diego Bay WMA	
Size (square miles)	444
Approximate Population	1,030,000
Responsible Agencies	• City of Chula Vista • City of Coronado • City of Imperial Beach • City of La Mesa • City of Lemon Grove • City of National City • City of San Diego • San Diego Unified Port District • San Diego County Regional Airport Authority • County of San Diego • Caltrans (Voluntary participant)
Land Use	Vacant or Undeveloped (58%); Residential, Retail or Office, Industrial, Transportation, and Miscellaneous encompass 42% total
WQIP HPWQCs	• Potential impairments in Chollas Creek of water quality by indicator bacteria (contact water recreation beneficial use [REC-1]) and by metals (warm freshwater habitat beneficial use [WARM], for copper, lead, and zinc).
WQIP Goals	• Reduce metals levels in Chollas Creek (by FY 2029 for dry and wet weather). • Reduce bacteria levels in Chollas Creek (by FY 2021 for dry weather and by FY 2031 for wet weather).
WQIP Strategies	Including, but not limited to: • Enhanced street sweeping and catch basin cleaning in the Chollas Creek hydrologic subarea • Wetland and habitat restoration • Public access improvements

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VI. TIJUANA RIVER WMA

The Tijuana River WMA is the furthest south in San Diego County, straddling the international border between California and Mexico and encompassing a total of 1,750 square miles. Approximately 27 % or 467 square miles are in the U.S. portion of the WMA, and approximately 22 square miles are in the City's jurisdiction. Two main tributaries feed the 120 mile long Tijuana River: one beginning in the Laguna Mountains in the U.S., and the other above the Abelardo L. Rodriguez Dam in Mexico. Water originating from the Abelardo L. Rodriguez Dam flows in a concrete-lined channel to the international border. The Tijuana River drains to the Tijuana Estuary and Pacific Ocean through the Tijuana River Valley on the U.S. side of the border. The Tijuana River National Estuarine Research Reserve, a major habitat preserve, is located within the estuary.

The South Bay International Wastewater Treatment Plant, South Bay Water Reclamation Plant, Pine Valley Wastewater Treatment Plant, and the Rancho del Campo Wastewater Treatment Plant contribute to the flow of the main rivers and creeks. Treated and untreated wastewater from Mexico also contributes to the flow of the WMA. In large storm events the wastewater treatment plants do not have sufficient capacity to treat all of the flows that enter the treatment plants.

A summary of WMA community and land use information is provided in Table A-6. Approximately 84% of the land with the U.S. portion is currently undeveloped or designated open space. The WMA is significantly more urbanized in Mexico than in the U.S. portion. HPWQCs, goals and strategies identified in the Tijuana River WQIP are also included in the table.

Table A-6
Tijuana WMA and WQIP Summary Information

Tijuana WMA	
Size (square miles)	1,750 total; 467 in U.S. portion
Approximate U.S. Population	83,000
Responsible Agencies	• City of Imperial Beach • City of San Diego • County of San Diego
Land Use	Vacant or Undeveloped (58%); Open Space, Parks, or Preserve Areas (26%); Residential (10%); Agriculture (2%); Freeway (1%); Commercial (<1%), Industrial (<1%), or Military (<1%)

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Table A-6
Tijuana WMA and WQIP Summary Information

Tijuana WMA	
WQIP HPWQCs	• Sedimentation, siltation, and turbidity during wet weather in portions of the lower Tijuana River and the Tijuana River Estuary.
WQIP Goals	• Reduce sediment loads by FY 2028.
WQIP Strategies	Including, but not limited to: • Enhanced storm drain system maintenance • Amending BMP design manual standards • Performing routine construction site inspections • Low impact development

APPENDIX B

Summaries of Watershed Management Area-Specific Beneficial Uses

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-1
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
San Dieguito River WMA

Beneficial Uses	Green Valley Creek	Lake Hodges	San Dieguito River, HSA 905.11	Pacific Ocean
Municipal and domestic supply (MUN)	X	X	+	
Agricultural supply (AGR)	X	X	P	
Industrial service supply (IND)	X	X	P	X
Industrial Process Supply (PROC)	X	X		
Groundwater recharge (GWR)	P			
Freshwater replenishment (FRSH)				
Hydropower generation (POW)				
Contact water recreation (REC-1)	X	X	X	X
Non-contact recreation (REC-2)	X	X	X	X
Preservation of biological habitats of special significance (BIOL)				X
Warm freshwater habitat (WARM)	X	X	X	
Cold freshwater habitat (COLD)		X	X	
Wildlife habitat (WILD)	X	X	X	X
Rare, threatened, or endangered species (RARE)		X		X
Spawning, reproduction, and/or early development (SPWN)			X	X
Navigation (NAV)				X
Commercial and sport fishing (COMM)				X

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-1
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
San Dieguito River WMA

Beneficial Uses	Green Valley Creek	Lake Hodges	San Dieguito River, HSA 905.11	Pacific Ocean
Estuarine habitat (EST)				
Marine habitat (MAR)				X
Aquaculture (AQUA)				X
Migration of aquatic organisms (MIGR)				X
Shellfish harvesting (SHELL)				X

X = Existing Beneficial Use, P = Potential Beneficial Use, + = Exempted from MUN Beneficial Use, HSA = hydrologic subarea

Table B-2
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
Los Peñasquitos WMA

Beneficial Uses	Beeler Creek	Carmel Valley	Carroll Canyon	Chicarita Creek	Los Peñasquitos Creek, HSA 9	Los Peñasquitos Creek, HSA 906.10	Los Peñasquitos Creek, Unnamed Tributary	Los Peñasquitos Lagoon	Soledad Canyon Creek
Municipal and domestic supply (MUN)	+	+	+	+	+	+	+		+
Agricultural supply (AGR)	X	X	X	X	X	X	X		X

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-2
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
Los Peñasquitos WMA

Beneficial Uses	Beeler Creek	Carmel Valley	Carroll Canyon	Chicarita Creek	Los Peñasquitos Creek, HSA 9	Los Peñasquitos Creek, HSA 906.10	Los Peñasquitos Creek, Unnamed Tributary	Los Peñasquitos Lagoon	Soledad Canyon Creek
Industrial service supply (IND)	P	X	X	P	P	X	X		X
Industrial Process Supply (PROC)									
Groundwater recharge (GWR)									
Freshwater replenishment (FRSH)									
Hydropower generation (POW)									
Contact water recreation (REC-1)	X	P	P	X	X	P	P	X	P
Non-contact recreation (REC-2)	X	X	X	X	X	X	X	X	X
Preservation of biological habitats of						X		X	

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-2
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-Los Peñasquitos WMA

Beneficial Uses	Beeler Creek	Carmel Valley	Carroll Canyon	Chicarita Creek	Los Peñasquitos Creek, HSA 9	Los Peñasquitos Creek, HSA 906.10	Los Peñasquitos Creek, Unnamed Tributary	Los Peñasquitos Lagoon	Soledad Canyon Creek
special significance (BIOL)									
Warm freshwater habitat (WARM)	X	X	X	X	X		X		X
Cold freshwater habitat (COLD)			X						X
Wildlife habitat (WILD)	X	X	X	X	X		X	X	X
Rare, threatened, or endangered species (RARE)			X				X	X	
Spawning, reproduction, and/or early development (SPWN)								X	

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Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-2
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
Los Peñasquitos WMA

Beneficial Uses	Beeler Creek	Carmel Valley	Carroll Canyon	Chicarita Creek	Los Peñasquitos Creek, HSA 9	Los Peñasquitos Creek, HSA 906.10	Los Peñasquitos Creek, Unnamed Tributary	Los Peñasquitos Lagoon	Soledad Canyon Creek
Navigation (NAV)									
Commercial and sport fishing (COMM)									
Estuarine habitat (EST)								X	
Marine habitat (MAR)								X	
Aquaculture (AQUA)									
Migration of aquatic organisms (MIGR)								X	
Shellfish harvesting (SHELL)								X	

X = Existing Beneficial Use, P = Potential Beneficial Use, + = Exempted from MUN Beneficial Use

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-3
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas- Mission Bay WMA

Beneficial Uses	Mission Bay	Pacific Ocean	Rose Canyon	San Diego County Coastal Streams	Tecolote Creek
Municipal and domestic supply (MUN)			+	+	+
Agricultural supply (AGR)					
Industrial service supply (IND)	X	X			
Industrial Process Supply (PROC)					
Groundwater recharge (GWR)					
Freshwater replenishment (FRSH)					
Hydropower generation (POW)					
Contact water recreation (REC-1)	X	X	X		
Non-contact recreation (REC-2)	X	X	X	X	
Preservation of biological habitats of special significance (BIOL)		X			X
Warm freshwater habitat (WARM)			X	X	X
Cold freshwater habitat (COLD)					
Wildlife habitat (WILD)	X	X	X	X	X
Rare, threatened, or endangered species (RARE)	X	X			
Spawning, reproduction, and/or early development (SPWN)	X	X			
Navigation (NAV)	X	X			

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-3
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas- Mission Bay WMA

Beneficial Uses	Mission Bay	Pacific Ocean	Rose Canyon	San Diego County Coastal Streams	Tecolote Creek
Commercial and sport fishing (COMM)	X	X			
Estuarine habitat (EST)	X				
Marine habitat (MAR)	X	X			
Aquaculture (AQUA)		X			
Migration of aquatic organisms (MIGR)	X	X			
Shellfish harvesting (SHELL)	X	X			

X = Existing Beneficial Use, P = Potential Beneficial Use, + = Exempted from MUN Beneficial Use

Table B-4
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas- San Diego River WMA

Beneficial Uses	Alvarado Canyon	Lake Murray	Murphy Canyon	Pacific Ocean	San Diego River	San Diego River, Unnamed Tributary
Municipal and domestic supply (MUN)	+	X	+		+	+
Agricultural supply (AGR)	X		X		X	X
Industrial service supply (IND)	X	X	X	X	X	X
Industrial Process Supply (PROC)						
Groundwater recharge (GWR)						

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-4
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
San Diego River WMA

Beneficial Uses	Alvarado Canyon	Lake Murray	Murphy Canyon	Pacific Ocean	San Diego River	San Diego River, Unnamed Tributary
Freshwater replenishment (FRSH)						
Hydropower generation (POW)		X				
Contact water recreation (REC-1)	X	X	X	X	X	X
Non-contact recreation (REC-2)	X	X	X	X	X	X
Preservation of biological habitats of special significance (BIOL)				X	X	
Warm freshwater habitat (WARM)	X	X	X		X	X
Cold freshwater habitat (COLD)		X				
Wildlife habitat (WILD)	X	X	X	X	X	X
Rare, threatened, or endangered species (RARE)			X	X	X	X
Spawning, reproduction, and/or early development (SPWN)				X		
Navigation (NAV)				X		
Commercial and sport fishing (COMM)				X		
Estuarine habitat (EST)						

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Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-4
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
San Diego River WMA

Beneficial Uses	Alvarado Canyon	Lake Murray	Murphy Canyon	Pacific Ocean	San Diego River	San Diego River, Unnamed Tributary
Marine habitat (MAR)				X		
Aquaculture (AQUA)				X		
Migration of aquatic organisms (MIGR)				X		
Shellfish harvesting (SHELL)				X		

X = Existing Beneficial Use, P = Potential Beneficial Use, + = Exempted from MUN Beneficial Use

Table B-5
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
San Diego Bay WMA

Beneficial Uses	Chollas Creek	Otay River	Powerhouse Canyon	San Diego Bay	Sweetwater River	Unnamed Intermittent Streams, HSA 908.31*
Municipal and domestic supply (MUN)	+	+	+		+	+
Agricultural supply (AGR)		X				
Industrial service supply (IND)				X	X	
Industrial Process Supply (PROC)						
Groundwater recharge (GWR)						

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-5
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas-
San Diego Bay WMA

Beneficial Uses	Chollas Creek	Otay River	Powerhouse Canyon	San Diego Bay	Sweetwater River	Unnamed Intermittent Streams, HSA 908.31*
Freshwater replenishment (FRSH)						
Hydropower generation (POW)						
Contact water recreation (REC-1)				X		
Non-contact recreation (REC-2)	X	X	X	X	X	X
Preservation of biological habitats of special significance (BIOL)				X		
Warm freshwater habitat (WARM)	X	X	X		X	X
Cold freshwater habitat (COLD)						
Wildlife habitat (WILD)	X	X	X	X	X	X
Rare, threatened, or endangered species (RARE)		X		X		
Spawning, reproduction, and/or early development (SPWN)				X		
Navigation (NAV)				X		

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-5
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas- San Diego Bay WMA

Beneficial Uses	Chollas Creek	Otay River	Powerhouse Canyon	San Diego Bay	Sweetwater River	Unnamed Intermittent Streams, HSA 908.31*
Commercial and sport fishing (COMM)				X		
Estuarine habitat (EST)				X		
Marine habitat (MAR)				X		
Aquaculture (AQUA)						
Migration of aquatic organisms (MIGR)				X		
Shellfish harvesting (SHELL)				X		

X = Existing Beneficial Use, P = Potential Beneficial Use, + = Exempted from MUN Beneficial Use, HSA = hydrologic subarea

* Includes Paleta Creek, which is not directly listed in the Basin Plan.

Table B-6
Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas- Tijuana River WMA

Beneficial Uses	Smuggler's Gulch	Tijuana River	Tijuana River Estuary	Tijuana River, Unnamed Intermittent Streams	Wruck Canyon
Municipal and domestic supply (MUN)	+	+		+	+
Agricultural supply (AGR)					X
Industrial service supply (IND)	P				
Industrial Process Supply (PROC)					

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-6

Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas- Tijuana River WMA

Beneficial Uses	Smuggler's Gulch	Tijuana River	Tijuana River Estuary	Tijuana River, Unnamed Intermittent Streams	Wruck Canyon
Groundwater recharge (GWR)					
Freshwater replenishment (FRSH)					
Hydropower generation (POW)					
Contact water recreation (REC-1)	P		X		
Non-contact recreation (REC-2)	X	X	X	X	X
Preservation of biological habitats of special significance (BIOL)		X	X		
Warm freshwater habitat (WARM)	X	X		X	X
Cold freshwater habitat (COLD)					
Wildlife habitat (WILD)	X	X	X	X	X
Rare, threatened, or endangered species (RARE)		X	X		
Spawning, reproduction, and/or early development (SPWN)			X		
Navigation (NAV)					
Commercial and sport fishing (COMM)			X		
Estuarine habitat (EST)			X		
Marine habitat (MAR)			X		

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

Table B-6

Beneficial Uses of Water Bodies in MWMP Proposed Maintenance Areas- Tijuana River WMA

Beneficial Uses	Smuggler's Gulch	Tijuana River	Tijuana River Estuary	Tijuana River, Unnamed Intermittent Streams	Wruck Canyon
Aquaculture (AQUA)					
Migration of aquatic organisms (MIGR)			X		
Shellfish harvesting (SHELL)			X		

X = Existing Beneficial Use, P = Potential Beneficial Use, + = Exempted from MUN Beneficial Use

APPENDIX B
Summaries of Watershed Management Area-Specific Beneficial Uses

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