APPENDIX A

Municipal Waterways Maintenance Plan

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Municipal Waterways Maintenance Plan

Transportation & Storm Water Department
Storm Water Division – Operations & Maintenance Section
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APPENDICES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
BLA	Boundary Line Adjustment
BMP	best management practice
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CIP	Capital Improvement Program
City	City of San Diego
County	County of San Diego
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DSD	Development Services Department
EIR	Environmental Impact Report
EP	Environmental Protocol
ESL	Environmentally Sensitive Lands
FMP	Facility Maintenance Plan
H&H	hydrologic and hydraulic
HU	Hydrologic Unit
I-	Interstate
LCP	Local Coastal Program
LDC	Land Development Code (Chapters 11–14 of San Diego Municipal Code)
MBHS	Mission Bay High School
MHPA	Multi-Habitat Planning Area
MMP	Master Storm Water System Maintenance Program
MND	Mitigated Negative Declaration
MS4	municipal separate storm sewer system
MSCP	Multiple Species Conservation Program
MWMP	Municipal Waterways Maintenance Plan
NPDES	National Pollutant Discharge Elimination System
PB	Pacific Beach
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SCR	Substantial Conformance Review
SDMC	San Diego Municipal Code

Acronym/Abbreviation	Definition
SDP	Site Development Permit
SR-	State Route
TSW	Transportation & Storm Water Department
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WMA	Watershed Management Area
WPCP	Water Pollution Control Plan
WQIP	Water Quality Improvement Plan

GLOSSARY

Access Area

An access area is necessary for equipment to enter, exit, or load material to/from the maintenance areas. The access area may be combined with a staging area or may be separate. It may include temporary access ramps and/or loading pads.

Bank Repair

Bank repair involves the repair and stabilization of banks to its as-built or original condition when a weakened, unstable, or failing bank causes or threatens damage to an adjacent property; increases the flood risk; threatens public safety; impacts roads, transportation, or access; generates erosion; increases downstream sediment yields; or impacts riparian habitat and/or other natural resource values. Methods for bank repair include bank regrading (both involving equipment within or outside the channel); installation of engineered backfilled soils; use of erosion-control fabric; planting of native vegetation; and where existing riprap is damaged, replacement of riprap.

Brow Ditch

Brow ditches generally refer to small concrete or gunite-lined drainages that are installed to convey runoff from developed areas and typically do not replace or redirect natural stream courses.

Capital Improvement Program

For purposes of this *Municipal Waterways Maintenance Plan* (MWMP), Capital Improvement Program (CIP) projects include a variety of storm water infrastructure projects that result in improving, expanding, upgrading, or widening of an existing City of San Diego (City) asset, or projects that result in a new asset to the City. CIP projects are currently designed and implemented by the City's Public Works Department, on behalf of the City's Transportation & Storm Water Department.

Concrete Repair (Major and Minor)

Concrete repair activities refer to developed concrete-lined channels where the lining has been identified as damaged or eroded. The lining material may be concrete, gunite, slurry, asphalt, or other similar materials. Concrete repair (minor damage) involves spot repairs to damaged concrete panels (channel lining), barrier walls, or headwall structures. These activities require the minimal amount of impact necessary to fix the damaged concrete so the facility does not sustain further damage. Concrete repair (major damage) includes the replacement of large sections of the concrete channel lining, barrier walls, or headwall structures that have been severely damaged and need to be reconstructed to their existing constructed or as-built conditions.

Desilting Basin

A basin designed to detain sediment laden runoff and allow sediment to settle out before runoff is discharged.

Detention Basin

A basin designed to temporarily store storm runoff and release it in a controlled manner to reduce or eliminate flooding or other adverse effects downstream.

Drainage Channel

An open graded or lined channel that is wider than 8 feet across the bottom.

Drainage Ditch

An open graded or lined ditch that is 8 feet or less in width across the bottom. Drainage ditches include brow ditches. Infrastructure such as a channel, ditch, basin, or structure that conveys surface runoff from a drainage area. Drainage facilities constructed on private property and maintained by the property owners are considered to be private drainage facilities. They normally convey surface runoff on private property, but may, in some instances, be designed to intercept and convey seepage water. Occasionally, such facilities may be installed in a public right-of-way with an encroachment permit.

Drainage Facility

See “Public Drainage Facilities” and “Private Drainage Facilities.”

Drainage (Runoff) Area

A drainage or runoff area is a geographical area comprising the limits of contributory surface runoff to a storm drain system.

Drainage Structures

For purposes of this MWMP, drainage structures refer to storm drain inlet, outlet, headwalls, and cleanout structures.

Emergency Maintenance

Emergency maintenance results from a sudden unexpected occurrence, involving a clear and imminent danger, demanding immediate maintenance or repair action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services.

Facility Group

Drainage facilities that are located in the same drainage area and in proximity to one another and/or have been maintained concurrently are placed in a facility group. Each facility group consists of one or more facility segments. For example, the Mission Bay – Mission Bay High School (MBHS) facility group includes the Pacific Beach (PB)-Olney 1 and MBHS 1 segments.

Facility Maintenance Plan

A Facility Maintenance Plan (FMP) is a proposed project-level maintenance plan pertaining to a facility group and/or segment identifying the limits of authorized work, a summary of the facility location and environmental conditions, and a summary of the proposed maintenance and repair methods. See Appendix A for FMPs.

Facility Segment

Drainage facilities are divided into segments generally based on a change in channel substrate (earthen-bottom versus concrete-lined), Coastal Zone boundary, and/or a four-lane or larger roadway.

Flow Diversion

Temporary diversion of low-flow runoff typically captured via a pump immediately upstream of the maintenance area, diverted through a highline bypass or open channel area separate from the active maintenance areas, and returned to the channel via a highline outlet or channel opening, with appropriate best management practices to dissipate potentially erosive discharge flow rates. Such diversions are not considered to be dewatering. Alternative forms of diversions include pumping flowing or standing water to a settling tank prior to discharge downstream of the work area or pumping flows to the sanitary sewer, with appropriate approvals.

Hydrology and Hydraulics

The evaluation of flow and geomorphological processes such as aggradation (sedimentation) and degradation (erosion). Within the context of the MWMP, this evaluation is conducted primarily to assess facility conveyance capacity, flood risk, and the potential for erosion.

Hydrologic Unit

A unit of watershed division classified by California that is smaller than hydrologic regions and larger than hydrologic areas. Hydrologic units represent major rivers and are similar to the U.S. Geological Survey's eight-digit hydrologic unit code. There are seven hydrologic units within the City of San

Diego; from north to south: San Dieguito, Peñasquitos, San Diego, Pueblo San Diego, Sweetwater, Otay, and Tijuana.

Hydrologic Area

A unit of watershed division classified by California that is smaller than a hydrologic region and hydrologic unit, but larger than a hydrologic subarea. Hydrologic areas represent major tributaries and are similar to the U.S. Geological Survey's 10-digit hydrologic unit code.

Invasive Plant Species Treatment/Removal

Where substantial stands of invasive plant species are documented, invasive plant treatment/removal will be identified. Removal and eradication of these invasive vegetation communities may be performed during proposed maintenance activities or as a restoration activity using mechanized, hand, and/or herbicide treatment methods per the biological recommendations.

Minor Maintenance

Maintenance or repair activities that do not result in impacts to Environmentally Sensitive Lands, as defined by the City of San Diego Land Development Code, do not require other regulatory permits, including a Coastal Development Permit or authorizations under Section 401/404 of the federal Clean Water Act, the California Fish and Game Code, or the state Porter-Cologne Act.

Maintenance Activities

Maintenance activities are construction activities intended to manage sediment, vegetation, and/or debris to restore the as-built/original design capacity of a drainage facility.

Maintenance Area

A maintenance area is a project-defined, authorized area in a drainage facility, such as a channel, ditch, detention basin, or outlet/inlet maintenance or repair.

Municipal Waterways Maintenance Plan

A *Municipal Waterways Maintenance Plan* (MWMP) is a document that provides guidance and parameters for maintenance and repair of the storm water conveyance system in areas where potential local, state, and federally regulated impacts may be necessary to provide flood control.

Permanent Best Management Practice Facilities

For purposes of this MWMP, permanent best management practice (BMP) facilities refer to bioretention basins, vegetated swales, and other permanent water quality improvement drainage facilities.

Post-Maintenance Erosion Control Measures

These measures are intended to reduce the potential for erosion following removal of vegetation. Post-maintenance erosion control measures reduce scour and channel erosion by reducing flow velocity and increasing residence time within the channel, allowing sediment to settle. Examples include small barriers constructed of rock, riprap, gravel bags, sandbags, fiber rolls, or other proprietary products placed across a constructed swale or drainage ditch.

Project-Level Activity

Activities identified in the MWMP and analyzed at a project level under the City of San Diego *California Environmental Quality Act Significance Determination Thresholds* (2016) to include analysis of a project's potential environmental impacts and identification of appropriate site-specific measures to avoid, minimize, and mitigate those impacts to the extent feasible. These activities are identified in Appendices A-1, A-2, A-3, and A-4 for site-specific and generic FMPs.

Program-Level Activity

Activities identified in the MWMP and analyzed at a program level under the City's *California Environmental Quality Act Significance Determination Thresholds* (2016) to include analysis of the MWMP's potential environmental impacts and identification of a mitigation framework to avoid, minimize, and mitigation impacts to the extent feasible. These programmatic activities are identified as including changed conditions, compensatory mitigation sites, and emergency maintenance or repairs.

Private Drainage Facilities

Drainage facilities constructed on private property and maintained by the property owners are considered to be private drainage facilities. They normally convey surface runoff on private property but may, in some instances, be designed to intercept and convey seepage water. Occasionally, such facilities may be installed in a public right-of-way with an encroachment permit.

Public Drainage Facilities

Public drainage facilities are natural or built facilities (or a combination of the two) that may be constructed to City standards and convey drainage through public street rights-of-way and public drainage easements, except for private facilities installed by encroachment permit.

Repair Activities

Construction activities intended to repair damaged infrastructure, including concrete-lining, headwalls, culverts, trash fences, and slopes, to restore as-built/original design features and function of a drainage facility.

Riprap Repair/Replacement

Riprap repair/replacement involves the repair of riprap where damage is observed and the replacement of the riprap section in locations where as-built drawings indicate the use of riprap.

Routine Maintenance

Defined in General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ [as amended by 2010-0014-DWQ and 2012-006-DWQ], National Pollutant Discharge Elimination System [NPDES] No. CAS000002) as "maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility." For purposes of this MWMP, the most common routine maintenance activities are described in site-specific and generic FMPs (see Appendices A-1, A-2, A-3, and A-4).

Sediment/Debris Removal

Removal of excess accumulated sediment and/or debris, which may include native and non-native vegetation, up to the as-built/original design or established maintenance baseline of the facility. Does not include expansion of the facility capacity beyond the original design.

Staging Area

A staging area is an area necessary for equipment and materials staging, storage, and minor equipment maintenance.

Stockpiling Area

A stockpiling area is an area used to temporarily stockpile excavated materials prior to permanent disposal.

Storm Drain

A storm drain is a system of closed drainage conduits connected by cleanouts, inlets, pipes/culverts, box culverts, catch basins, and other structures and appurtenances.

Vegetation Management

Vegetation management refers to the trimming, grubbing, blading, mowing, and/or removal of vegetation. Grubbing, blading, and mowing include the removal of aboveground vegetation leaving

root systems mostly intact. Grubbing typically involves the removal or destruction of vegetation by disturbance to the root system or soil surface by mechanical, chemical, or other means such as cutting and/or driving over aboveground vegetation. Blading is the removal of aboveground vegetation with a straight-blade bulldozer. Mowing is the removal of aboveground vegetation with a machine (hand-held or driven). Trimming is the removal of select vegetation that is generally above waist height and limited to woody vegetation or cutting overhanging vegetation or limited to overhanging vegetation that encroaches on a facility from adjacent areas. Removal is grubbing and/or the complete removal of aboveground vegetation and roots, up to the as-built sediment depth. Removal could be conducted through a variety of methods, including mechanized removal, hand removal, and/or herbicide application. Vegetation management may include handling invasive, native, and/or non-native plant species.

Water Quality Improvement Plan

A Water Quality Improvement Plan (WQIP) provides a watershed-based regulatory evaluation of water quality conditions and requires efforts by municipal storm water permittees to improve these water quality conditions.

Watershed

For purposes of this report, watershed is used interchangeably with watershed management area (WMA), Hydrologic Unit (HU), or Hydrologic Area.

Watershed Management Area

Watershed management areas (WMAs) are identified in the City's WQIPs pursuant to the current Municipal Separate Storm Sewer System (MS4) Permit issued for the San Diego Region and generally coincide with either an HU or Hydrologic Area, as identified by the U.S. Geological Survey. The Mission Bay WMA is separate from the Los Peñasquitos WMA; both occur within the Los Peñasquitos HU. The San Diego Bay WMA includes the Pueblo, Sweetwater, and Otay HUs.

Watershed Master Plan

A *Watershed Master Plan* provides an evaluation of the storm water conveyance system within each watershed or drainage area within the City to determine conveyance capacity, infrastructure longevity, and opportunities for multi-benefit infrastructure improvements that achieve as many of the following goals as possible:

- Reduce flood risk.
- Improve water quality.
- Restore streams and waterways with native habitat.

Water Pollution Control Plan

A written plan submitted to the City for projects that do not require coverage under the Construction General Permit and have no Construction General Permit *Storm Water Pollution Prevention Plan*. The *Water Pollution Control Plan* (WPCP) documents the series of phases and activities that characterize the construction site and describes actions that prevent the pollution of storm water discharges from the site. This MWMP includes a WPCP guidance document as Appendix B that serves as the basis for site-specific WPCPs.

1 INTRODUCTION

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, and environmentally and aesthetically acceptable manner for the protection of property and life (see Figure 1, Regional Map). 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. The City's storm water conveyance system serves to convey storm water flows to protect the life and property of its citizens from potential flooding within the six watershed management areas (WMAs) and seven hydrologic units (HUs) within the City (see Table 1 and Figure 2, Vicinity Map). For purposes of this *Municipal Waterways Maintenance Plan* (MWMP), a combination of these WMAs and HUs are used throughout this document to organize lists and figures of facilities and compensatory mitigation sites into eight watersheds. The City's storm water conveyance system also serves to convey urban runoff from pervious and impervious surfaces and development, such as irrigated landscape areas, driveways, and streets that flow into drainage facilities and, ultimately, to the ocean. Additionally, the City's storm water conveyance system helps to protect water quality, and open facilities, such as channels, can support natural resources, including wetland habitat.

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 (TSW) is responsible for evaluating and conducting maintenance and repair of the public municipal storm water conveyance system throughout much of the City. To maintain the system's effectiveness, this MWMP identifies specific activities, methods, and procedures that will guide ongoing maintenance and repair of facilities. This MWMP provides a comprehensive approach to identify and regulate maintenance and repair activities, primarily within open storm water facilities (i.e., those facilities located above ground and not within closed systems, such as pipes).

Subsequent to distribution of the Draft EIR, the City removed one facility group, Murphy Canyon Creek – Stadium 1 and 2 (two segments: 4-04-000 and 4-04-002) from the MWMP. As such, these two segments, which are located on City-owned property that is planned to be sold to California State University as part of the SDSU West redevelopment, are no longer proposed as Facility Maintenance Plans (FMPs) (i.e., maintenance covered at a project level) in this MWMP, and/or covered at a project or program level in the associated Final EIR. Upon completion of the property sale, the City will no longer be responsible for conducting maintenance at this facility. It should be noted however, that the Murphy Canyon Creek facility group will still exist as an A-1 FMP but will only contain Murphy Canyon 1 and 2 segments. In summary, the removal of these two segments as shown in ~~strikeout~~/underline has a negligible effect to the project as a whole, as described below:

- Total facility groups evaluated for FMP/project-level analysis remain at 69
- Total segments evaluated for FMP/project-level analysis are reduced from 129 to 127 segments
- Total miles of facilities evaluated for FMP/project-level analysis remain at 26 miles
- Total facility groups with a FMP/project-level analysis remain at 66
- Total segments with a FMP/project-level analysis are reduced from 113 to 111 segments
- Total miles of maintenance under a FMP/project-level analysis remain at approximately 18 miles

Revisions and additional editorial changes made to the updated MWMP (March 2020) are shown in strikeout (i.e., ~~strikeout~~) where text is removed and underlined (i.e., underline) where text is added for clarification.

1.1 STORM WATER SYSTEM

The City's storm water system conveys drainage flows from pervious and impervious surfaces to provide predictable flood inundation areas so that other areas can have human-oriented land uses that are relatively safe from flood damage. Storm water facilities include, but are not limited to, a network of underground storm drain pipes, culverts, outlet/inlet structures (e.g., headwalls), detention basins, ditches, and channels (as defined by City Council Policy 800-04) (see the Glossary, above). In most cases, these facilities were existing naturally and/or designed and installed concurrently with land development of the area. In a few locations, no previous design or as-built plans for the facility exist. At these locations, storm water is generally conveyed between a storm drain outlet and another storm drain inlet or receiving water via undeveloped land that often forms a natural channel or drainage pattern.

TSW has adopted a holistic management approach that seeks to maintain and improve the storm water conveyance systems simultaneously (see Exhibit 1, TSW Holistic Storm Water Strategy) by having complementary programs that provide information to managers that allow for effective decision making regarding City funding and implementation of studies, designs, plans, and maintenance activities.

Currently, TSW operates the following three concurrent and complementary planning processes:

- **Municipal Waterways Maintenance Plan (MWMP)** – Provides guidance and parameters for maintenance and repair of the storm water conveyance system in areas where potential local, state, and federally regulated impacts may be necessary to provide flood risk reduction.

- **Water Quality Improvement Plans (WQIPs)** – Provide a watershed-based regulatory evaluation of water quality conditions and required efforts by municipal storm water permittees to improve these water quality conditions.
- **Watershed Master Plans** (**WMPs)** – Provide an evaluation of the storm water conveyance system within each watershed or drainage area within the City to determine conveyance capacity, infrastructure longevity, and opportunities for multi-benefit infrastructure improvements that achieve as many of the following goals as possible:
    - Reduce flood risk.
    - Improve water quality.
    - Restore streams and waterways with native habitat.

Exhibit 1
TSW Holistic Storm Water Strategy

Based on this approach, information will be provided to the *Watershed Master Plan* and WQIP teams for facilities where maintenance will be proposed under the MWMP and the engineering evaluation or field observations indicate that an improvement may be required. Similarly, information from the *Watershed Master Plans* or WQIPs will be used in the MWMP. For example, a more limited maintenance approach may be used as an interim as-needed measure in areas where larger system improvements are planned in the near future.

It is the intent of the City that effective integration of these programs will facilitate improvements to drainage conditions throughout the City. Each program alone cannot fully address current and future maintenance and improvement needs or regulatory requirements. However, when implemented in an integrated fashion, the overall strategy allows the City to meet all regulatory requirements and effectively plan for future improvements that are expected to reduce the need and frequency of maintenance.

TSW also conducts planning and public outreach to ensure that decision makers and the public have information regarding the costs for long-term improvements and the potential benefits in terms of flood risk reduction, stream restoration, water quality protection, and overall quality of life.

1.2 WATERWAYS MAINTENANCE AND REPAIRS

Maintenance and repairs are an important component of operating the storm water conveyance system and providing reliable flood risk reduction throughout the City. Many storm water facilities were originally designed to require ongoing maintenance and repair. For example, concrete-lined trapezoidal channels are often designed to convey the 100-year storm event. However, if sediment accumulates in the channels, and vegetation establishes within the sediment, the conveyance capacity is often reduced, and adjacent developed properties are at greater risk of flooding. In other cases, storm water facilities damaged during large storm events require repair (e.g., replacement of broken concrete lining or dislodged riprap) to continue to provide safe storm water conveyance according to the original facility design. Finally, there are areas of the City where development or conditions have changed within the watershed, resulting in greater or faster storm water flows than predicted during the facility design, or the original design does not meet current standards. In these cases, a Capital Improvement Program (CIP) project is often needed to address the potential flood risk that exists or erosion potential due to a design that no longer meets the needs of the surrounding area; however, maintenance (removal of accumulated vegetation and sediment) may help alleviate the flood risk on an interim basis until a CIP project is designed and constructed.

Council Policy 800-04 states that the City will generally only accept responsibility for maintenance or repair of public drainage facilities that are designed and constructed to City standards and are located within a public street or drainage easement dedicated to the City (City of San Diego 2012). The MWMP is intended to only include storm water facilities, specifically open channels, detention basins, and drain structures that TSW has the responsibility to maintain. However, this responsibility is subject to verification at the time of maintenance and has not been verified for all facilities in this MWMP. In addition, Council Policy 700-44 encourages and establishes the responsibility for private property owners to implement flood control measures, such as the use of sandbags, to prevent and protect their property from flood damage (City of San Diego 1984).

1.2.1 BACKGROUND

Historically, maintenance of storm water conveyance system facilities occurred on an as-needed basis as a part of normal City operations without public review or regulatory permits. In September 2004, the County of San Diego (County), and all 18 cities within the County, received a letter titled "Directive Regarding Channel Maintenance Activities" from the Regional Water Quality Control Board (RWQCB) San Diego Region that mandated the submittal of a required technical report pertaining to channel maintenance activities and practices (RCMG 2008).

In 2013, the City adopted the Master Storm Water System Maintenance Program (MMP) to govern channel operation and maintenance activities based on a certified final recirculated Program Environmental Impact Report (PEIR). A lawsuit was filed regarding the MMP (*San Diegans for Open*

Government et al. v. City of San Diego, San Diego Superior Court Case No. 37-2011-00101571), and the City entered into a settlement agreement in 2013 that required, among other things, that the Program EIR be considered null and void as of September 2018 (*SDOG v. City of San Diego* 2013).

This MWMP is intended to replace the MMP and was developed through a collaborative and iterative process involving City staff and multiple stakeholders, including nonprofit organizations, community groups, resource agencies, and the public at large. This MWMP is intended to be adopted upon certification of a California Environmental Quality Act (CEQA) document for the MWMP, and, therefore, is subject to revisions during the CEQA process. Following CEQA certification of the MWMP's associated project-level EIR, TSW will seek several regulatory permits that may rely on the analysis contained in the certified CEQA document and require additional conditions of approval.

1.2.2 LOCATION

This MWMP addresses regulated maintenance and repair activities throughout the City. The City boundaries include six WMAs and seven HUs (Table 1 and Figure 2, Vicinity Map). For purposes of this MWMP, a combination of these WMAs and HUs are used throughout this document to organize lists and figures of facilities and compensatory mitigation sites into eight watersheds (Table 1).

Table 1
Watershed Management Areas and Hydrologic Units in the City of San Diego and MWMP Watersheds

Watershed Management Areas	Hydrologic Units	Watersheds Used in the MWMP
San Dieguito River	San Dieguito	San Dieguito River Watershed
Los Peñasquitos	Peñasquitos	Los Peñasquitos Watershed
Mission Bay		Mission Bay Watershed
San Diego River	San Diego River	San Diego River Watershed
San Diego Bay	Pueblo San Diego	Pueblo San Diego Watershed
	Sweetwater	Sweetwater Watershed
	Otay	Otay Watershed
Tijuana River	Tijuana	Tijuana River Watershed

Facilities covered within the MWMP would be distributed throughout the eight watersheds, with the highest concentration of facilities in the San Diego River and Pueblo San Diego watersheds. Flood risk in these watersheds is higher due to lower or non-existent flood protection standards required at the time of development, as well as increase in runoff from the addition of impervious area from new development.

The following plan-wide facilities comprise the City's storm water system:

- Approximately 50 miles of channels, ditches, and basins
- 48,561 drainage conveyance facilities (including storm drain pipes and channels)
- 55,334 structures (including inlets, outlets, cleanouts, and connectors)
- 3,724 drainage best management practice (BMP) facilities
- 85 CIP facilities (outlets, BMPs, and stream restoration)

1.3 PLAN OBJECTIVES

The following are the primary objectives of the MWMP:

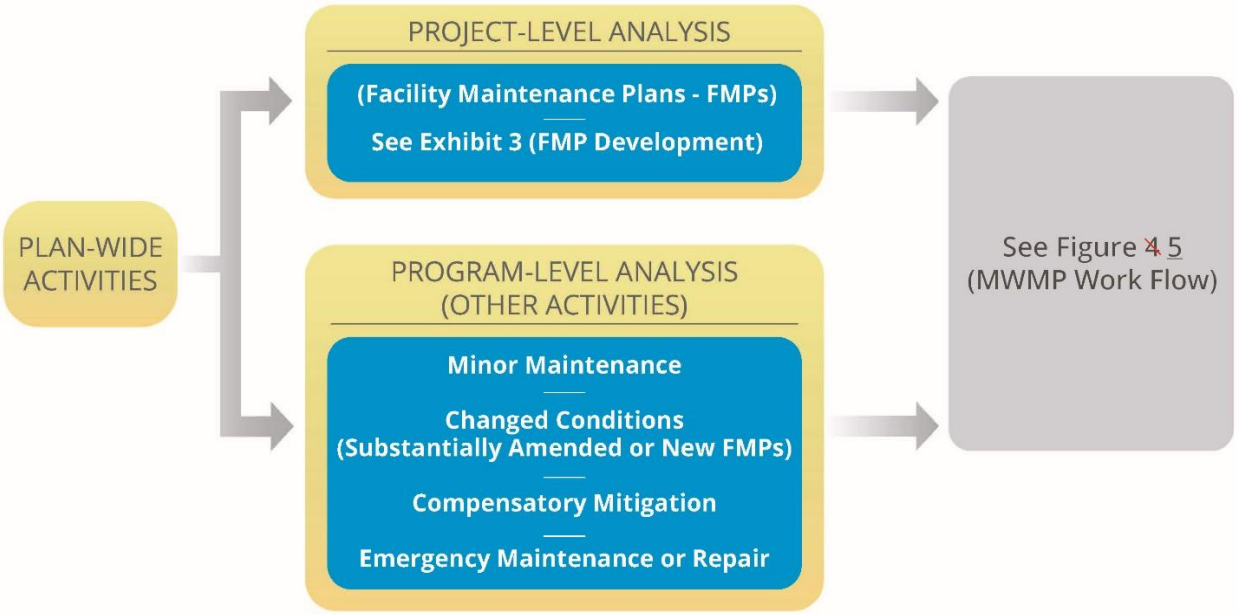
1. **Public safety and flood risk reduction**
    - Protect life and property adjacent to, downstream, and upstream of affected channels from flooding and environmental degradation.
2. **Responsiveness to reduce flood risk**
    - Provide for timely and consistent routine operations and maintenance in the affected channels and associated storm water conveyance infrastructure.
3. **Avoid, minimize, and/or mitigate potential effects to environmental resources**
    - Avoid, minimize, and/or mitigate significant adverse environmental effects resulting from routine maintenance of storm water facilities.
    - Incorporate and adapt to water quality management strategies intended to protect water quality and address flooding impacts.
4. **Proactive and timely approval process**
    - Provide project-level analysis up front to expedite subsequent authorizations for routine and preventive maintenance activities within storm water facilities.
    - Identify a review-and-approval process to include additional storm water facilities and maintenance activities that follow the protocols and requirements of the MWMP.
    - Reduce the need to conduct emergency maintenance during significant storm events by implementing preventive maintenance activities.

As previously stated, the objectives of the MWMP require the ability for TSW 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 will 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 (see Exhibit 2, Municipal Waterways Maintenance Plan Components).

Exhibit 2
Municipal Waterways Maintenance Plan Components



A summary of the sections below is as follows:

- Section 2, Maintenance and Repair Activities and Methods, provides a description of MWMP maintenance and repair activities, methods, and environmental protection measures.
- Sections 3.1 and 3.2 provide a brief summary of how facilities were selected for evaluation, how specific FMPs that incorporated avoidance and minimization of impacts were developed, and a summary of proposed FMPs.

- Section 3.3, Program-Level Analysis (Other Plan-Wide Activities), provides a list of additional plan-wide activities not captured under the project FMPs that could occur and are analyzed at a program level.

The proposed FMPs are included as Appendices A-1 through A-4. Appendix A-5 includes technical summaries of facilities analyzed at the project level that do not have proposed FMP because maintenance is not currently needed at this time. Appendix A-6 includes a list of additional facilities that are currently inspected but were not included for technical analysis as part of the MWMP.

Implementation of this MWMP requires approval by the City and resource agencies through issuance of the following:

Local

- Site Development Permit (SDP) and Coastal Development Permit (CDP) by the City under Land Development Code (LDC) Sections 126.0502 and 126.0702, respectively. An Ordinance is also required to permit a subsequent approval process that is not currently required by the City of San Diego Municipal Code (SDMC).

State

- 401 Water Quality Certification by California RWQCB San Diego Region, under Section 401 of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act.
- Master Streambed Alteration Agreement by California Department of Fish and Wildlife (CDFW), under Section 1602 of the California Fish and Game Code.
- CDP by California Coastal Commission (CCC), under Section 30601 of the California Coastal Act.

Federal

- Regional General Permit by the U.S. Army Corps of Engineers (USACE) under Section 404 of CWA.
- U.S. Fish and Wildlife Service (USFWS) – Section 7 Consultation.
- State Historic Preservation Office – Section 106 Consultation.

This MWMP outlines the submittal and approval process for the SDP/CDP (Section 4.2, Resource Agency Permits and Authorizations). Subsequent authorizations by USACE, USFWS, the State Historic Preservation Office, RWQCB, CDFW, and CCC will include similar processes.

2 MAINTENANCE AND REPAIR ACTIVITIES AND METHODS

The following is a description of MWMP routine maintenance activities that may occur within a specific FMP or plan-wide within the City. Although these activities may occur anywhere within the City's storm water system, the majority of routine maintenance and repairs are anticipated to occur within the facilities with identified FMPs (see Section 3.2.6, Proposed FMPs) and will require permits. Limited maintenance that often provides only partial improvement to flood risks can occur throughout much of the remainder of the system. The scope of work for this limited maintenance is such that it can be done without permits (see Section 3.3.1, Minor Maintenance or Repair). Any additional routine maintenance activities that require permits and are not consistent with identified FMPs (e.g., changed conditions) will require subsequent review, consistent with the MWMP framework (see Section 3.3, Program-Level Analysis).

The activities listed below provide the purpose of the routine maintenance or repair (e.g., manage vegetation, remove sediment, clear outlet/inlet drain structures, repair infrastructure). Various methods are used to accomplish these activities; these methods are listed in Section 2.3, Methods, and are grouped by those that pertain to facility maintenance; facility repair; and associated activities such as access, staging, loading, and BMPs.

2.1 MAINTENANCE ACTIVITIES

Based on evaluation of flood risk, with consideration of water quality, native habitat, regulatory requirements, and community concerns, a number of routine and minor maintenance activities may be proposed to reduce flood risk and extend the serviceable life of a facility/structure. These activities are described below.

Vegetation Management

Vegetation management refers to the grubbing, blading, mowing, trimming, and removal of vegetation. Vegetation management activities include vegetation removal and vegetation control activities, such as mowing and/or herbicide application. Grubbing and mowing include the removal of aboveground vegetation leaving root systems mostly intact. Trimming is the removal of limbs or branches from select vegetation that is generally above waist height and limited to woody vegetation or cutting overhanging vegetation. Removal is the complete removal of aboveground vegetation and belowground roots, up to the as-built sediment depth. Removal could be conducted through a variety of methods, including mechanized removal, hand removal, and/or herbicide application.

Where feasible, vegetation management focuses on the removal and eradication of non-native invasive species only; such focused efforts are described separately below under, "Invasive Plant Species Management." Areas subject to vegetation management generally require removal of any

species found to substantially reduce flood conveyance capacity. The Fire Department may also determine that vegetation removal or management is required if it poses a safety or fire hazard. The City will assess the conditions of the site and determine if vegetation removal may create an unsafe condition. Direct methods used for vegetation management include excavation (both with equipment in the channel and equipment staged outside the channel), mowing, and hand removal/trimming/herbicide application. Depending on the vegetation management method and the type of vegetation affected, such activities may be considered minor maintenance (see Section 3.3.1, Minor Maintenance or Repair) or may be considered routine maintenance and require an approved FMP. Methods that may be required to support vegetation management include temporary access/loading, temporary staging, stockpiling, temporary diversion, and BMPs.

Invasive Plant Species Management

In channels or facilities that contain substantial stands of invasive plant species, efforts will be made to remove and eradicate these invasive vegetation communities using mechanized, hand, or herbicide treatment methods within the limits of the permitted work area. Varied methods may be used to accomplish invasive species management, including mechanized removal that involves removal of root structures and sediment, mechanized grubbing or mowing that leaves roots and sediment intact, and/or hand removal. These methods are discussed in Sections 2.3.1, Facility Maintenance, and 3.3.1, Minor Maintenance or Repair.

Sediment/Debris Removal

Sediment and debris removal involves the removal of excess accumulated sediment and/or debris (i.e., trash and other waste materials). Accumulated sediment can reduce the flow capacity of a facility and increase the potential for flooding. Sediment removal, under this MWMP, is only allowed up to the as-built/original design or established maintenance baseline of the facility and does not include expansion of the facility capacity beyond the original design. In cases where an as-built drawing is not located, the engineering team uses the features of the channel and surrounding infrastructure combined with the knowledge of standard engineering design practices to determine the current design or natural condition of the facility/feature. This includes reviewing the elevation of culverts, extents of any riprap or concrete lining, and dimensions of headwalls/culverts. Direct methods used for sediment removal include excavation (both with equipment in the channel and equipment staged outside the channel) and dredging. Methods that may be required to support sediment and debris removal include temporary access/loading, temporary staging, stockpiling, temporary diversion, and BMPs.

Structural and/or Debris/Trash-Fence Clearing

Structural clearing involves the removal of built-up debris and vegetation from within or areas directly adjacent to an outlet/inlet structure and/or debris/trash-fence. Channels/ditches often occur directly adjacent to the outlet/inlet structure. Direct methods used for structural clearing include excavation (both with equipment in the channel/ditch adjacent to the outlet/inlet structure and equipment staged outside the channel/ditch adjacent to the outlet/inlet structure) and Vactor trucks staged outside the channel/ditch adjacent to the outlet/inlet, which can vacuum small amounts of sediment or standing water from within the outlet/inlet structure.

Culvert Clearing

Culvert maintenance includes the removal of sediment, trash, and other debris from existing culverts, which are storm water conduits typically under roads. Direct methods used for culvert clearing include excavation with equipment or hand tools in the culvert, and/or Vactor trucks staged outside the culvert that can vacuum small amounts of sediment or standing water from within the culvert structure.

2.2 REPAIR ACTIVITIES

Repair activities include those described below.

Concrete Repair (Minor and Major)

Concrete, including shotcrete or gunite, repair and replacement activities involve maintenance within developed concrete-lined channels or structures where the concrete lining or structure's form is damaged, cracked, or eroded based on existing constructed or original as-built conditions. Typical minor concrete repair activities include spot repairs to damaged concrete panels (channel lining), barrier walls, or headwall structures. Typical major concrete repair activities include reconstructing the channel lining, barrier walls, or headwall structures because they are missing or damaged enough that they need to be removed and replaced entirely. The terms "repair" and "replacement" are often referenced interchangeably; however, the extent to which the lining or form is damaged or compromised will determine whether the activity is considered a (1) minor or (2) major repair.

Bank Repair

Bank repair activities occur in channels along stream banks. Bank repair involves the repair and stabilization of banks to its as-built or original condition when a weakened, unstable, or failing bank causes or threatens damage to an adjacent property; increases the flood risk; threatens public safety; impacts roads, transportation, or access; generates erosion; increases downstream sediment yields; or impacts riparian habitat and/or other natural resource values. Methods for bank repair include bank regrading (both involving equipment within or outside the channel); installation of

engineered backfilled soils; use of erosion-control fabric; planting of native vegetation; and, where existing riprap is damaged, replacement of riprap. For earthen channels, additional bank repairs outside of authorized maintenance and access/loading/staging/stockpiling areas identified in the FMPs will require further evaluation depending on where bank failures occur in the future.

Structural and/or Debris/Trash-Fence Repair

Structures, such as inlets/outlets and debris/trash fences often need to be repaired if the structure is being undermined, or the debris/trash-fence has been destroyed and is not working properly. Repairs may require clearing debris and vegetation from within or from areas directly adjacent to an outlet/inlet structure and/or debris/trash-fence. In addition, concrete repairs, such as replacement of concrete footings for debris/trash fences or repairs to concrete wing-walls, involve reconstruction to as-built conditions. Outlet/inlet structures often are adjacent to, and discharge to/from channels/ditches, and debris/trash fences are within channel/ditches to catch debris before entering into a pipe or inlet/outlet structure. Direct methods used for structural clearing include excavation (with equipment in the channel/ditch adjacent to the outlet/inlet structure and with equipment staged outside the channel/ditch adjacent to the outlet/inlet structure) and Vactor trucks staged outside the channel/ditch, adjacent to the outlet/inlet that vacuum small amounts of sediment or standing water from within the outlet/inlet structure. Repair activities may also involve concrete repairs to the structure itself, or the footings for the debris/trash-fence.

2.3 METHODS

This section generally describes the methods and equipment expected to be used to maintain facilities included as part of the MWMP. These include earthen-bottom and concrete-lined channels/ditches, basins, and outlet/inlet structures.

2.3.1 FACILITY MAINTENANCE

Facility maintenance involves excavation (equipment in the channel and/or equipment outside of the channel), dredging, mowing, and hand removal of vegetation, trash, and debris.

Excavation (Equipment In Facility)

Equipment will enter/exit the maintenance area via an access point that will be selected to minimize direct and indirect, and short-term (e.g., removal of native vegetation) and long-term (e.g., destabilization of channel banks) impacts. A majority of concrete channels have existing paved access ramps that allow equipment to enter/exit directly in/out of the channel. When a ramp is not available, smaller equipment can be attached to a crane or Gradall/excavator to be lowered into the channel or facility from an adjacent bank or staging area, or a temporary ramp can be created using a portion of the sediment from within the channel or facility that was planned for removal.

Earth-moving equipment is used to remove and/or push the accumulated materials (vegetation, sediment, trash, debris) to the closest access point where materials can be removed from the facility. Material can then be scooped up with a loader excavator so that spoils can be deposited into a waiting dump truck or taken to a stockpile. When a dump truck is used, the materials are transported to an approved off-site disposal area, such as the landfill, or a temporary stockpile area. Typically, maintenance activities will be conducted in smaller sections/areas within the channel or facility itself to accommodate equipment moving short distances to excavate and transport material.

Depending on the conditions associated with each channel or facility, different types of mechanized equipment can be used so operations can run effectively. The decision about which mechanized equipment to use will be based on the following:

- Crew supervisor's discretion/institutional knowledge.
- The density and volume of accumulated material.
- The authorizations or permits necessary for the work to occur.
- Vegetation growth.
- The size (width and depth) of the channel or facility.
- Access and loading areas.
- The flow characteristics of the channel or facility.
- Any repairs to BMPs determined to be necessary.
- The timing or need to complete maintenance activities as safely and efficiently as possible to avoid equipment operation during sensitive bird and animal breeding season(s).

Equipment can range in size, from 4 feet wide for the smallest skid-steer to 14.5 feet wide for a large bulldozer. Smaller equipment, such as skid-steers, will typically be used for narrow, shorter (in distance) channels, while larger equipment will be used for wider, longer channels. Small channels are typically less than 8 feet in width and less than 1,000 feet in length. City Council Policy 800-04 defines a drainage ditch as an open graded or lined ditch that is 8 feet or less in width across the bottom, and a channel is an open graded or lined ditch that is wider than 8 feet across the bottom. Equipment that will be used to perform excavation includes bulldozers, excavators, loaders, extended-arm Gradall, rock trucks, bobcats, Vactor, and backhoes.

Excavation (Equipment Outside of the Facility)

Where feasible, equipment is staged outside of the channel, and vegetation, sediment, trash, or debris is removed without placing equipment within the channel. The main feasibility factors include the existence of a disturbed or developed access area along the entire length of the facility that is

sufficiently wide enough to allow equipment to reach the full facility, the condition of the material within the channel (e.g., excessively deep and saturated soils may not be suitable for equipment to operate within the channel), and the time needed to complete the work. Where it is feasible, Gradall or excavators will be stationed above the channel bank and will directly reach into the channel or facility to remove accumulated material. Each bucket of material will be loaded directly into a waiting dump truck to be transported to an approved off-site disposal area.

Dredging

Dredging equipment may include settling/storage tanks, geotubes, a hydraulic dredger, or other similarly functioning equipment. The first steps in the process involve testing and calibration to ensure all equipment is working together. A hydraulic dredger can be placed in the facility, using a floating barge, or on mechanized equipment. Outside of the channel, a settling/storage tank system and geotubes are used to remove all material dredged from the channel to allow clean water to re-enter. Dredging material is dewatered, loaded, and hauled to an approved off-site disposal location.

Hand Removal of Vegetation/Trash/Debris

Where equipment access is limited, site conditions prohibit the use of heavy equipment, or the methodology recommends vegetation trimming or removal, maintenance can be performed manually by crews using hand tools (e.g., mowers, string trimmers, tri-blades, loppers, chainsaws, and shears). As a result, non-mechanical maintenance will be limited to removal of aboveground vegetation, trash and debris, and minor amounts of sediment. Vegetation will be cut at its base or to the high-water mark, leaving the plant roots in the streambed. In this event, the cut vegetation will be collected, hauled out by hand, and disposed in a suitable, pre-approved, off-site location.

The methods described are general and could be used for any type of vegetation, trash, or debris removal. When invasive plants are to be removed, specialized methods will be used. Determination as to the invasiveness of a plant species will be based on the most current California Invasive Plant Council's Invasive Plant Inventory. In most cases, care will be taken to avoid the spread of seeds and propagules (e.g., bagging cut vegetation prior to removing from the channel). Chemical treatments may also be applied by a licensed applicator according to applicable regulations.

2.3.2 FACILITY REPAIR

Bank Grading and Stabilization

Where bank grading is necessary to recontour an earthen channel to its as-built or original design, equipment may conduct the grading work from within the channel or from outside the channel limits on the bank of the channel. This method is typically conducted as part of channel excavation,

but may also be conducted in areas of bank erosion that are not necessarily subject to vegetation or sediment removal.

Equipment that could be used to perform bank-grading activities includes a bulldozer, excavator, extended-arm Gradall, loader, bobcat, backhoe, or scraper. The type and location of equipment will depend on several factors, including the following:

- Size of bank grading area
- Channel access and loading
- The authorizations or permits necessary for the work to occur
- Channel bottom conditions (dry or saturated)
- Presence of native vegetation within or surrounding the channel
- The reach of equipment available for use during work
- The need to complete grading activities in a timely, safe, and efficient manner

During bank repair activities, earth-moving equipment will grade the channel bank to the as-built or to an approved, stable condition. When needed, an evaluation will be conducted to determine bank stability, and necessary stabilization will be implemented in locations where bank or channel erosion is documented during the site assessments, and the condition was deemed by the engineering team to need additional evaluations. These methods include installation of engineered backfilled soils and erosion-control fabric and planting of native vegetation. When earthen bank repair is needed, a geotechnical report will be required and prepared in accordance with LDC Section 142.0131 and the City's Guidelines for Geotechnical Reports (City of San Diego 2018). The earthen bank repair design will incorporate the recommendations of the geotechnical report. Replacement of existing riprap bank stabilization is discussed separately herein, and installation, maintenance, and post-maintenance erosion control measures are discussed in Section 2.3.3, Associated Activities and BMPs.

Concrete Repair (Minor and Major)

Concrete, including shotcrete or gunite, repair and replacement activities involve maintenance within developed concrete-lined channels or structures where the concrete lining or structure's form is damaged, cracked, or eroded based on existing constructed or original as-built conditions. The extent to which the lining or form is damaged or compromised will determine whether the concrete will need to be repaired (minor damage) or replaced (major damage).

Minor concrete repair requires the minimal amount of impact necessary to fix the damaged concrete so the facility does not sustain further damage. This type of maintenance may take a few days or several weeks and is usually completed by City crews. Minor concrete repair may require

minimal surficial recontouring of existing soils or imported aggregate to provide a suitable substrate to pour concrete.

Major concrete repair involves the reconstruction of large sections of the concrete channel lining, barrier walls, or headwall structures that have been severely damaged and need to be reconstructed to its existing constructed or as-built conditions. This type of maintenance may take several weeks to a few months and could require specialized contractors to complete. Major concrete repair may also require the underlying soil to be excavated approximately 1–2 feet to provide a suitable substrate to pour concrete.

Both minor and major concrete repair activities can be carried out in the same manner or methodology. However, the majority of minor repair activities can be done by hand when crews can remove cracked or deteriorated concrete, clean the surface, and then apply a bonding agent (concrete, shotcrete, gunite) as needed. For both minor and major repair activities that require mechanized equipment; crews may use an excavator, Gradall, and/or skid-steer (bobcat), with corresponding attachments (e.g., impulse or jackhammer) to regrade any underlying surficial soils or lift concrete that is too large/heavy to be removed by hand. Only major repair activities will require excavation greater than 1–2 feet below surficial soils. This type of major concrete repair may also be engineered to meet original construction, as-built construction, or standard construction specifications.

Both major and minor concrete repair activities will involve preparing the surface and work area. Vactors or bypass diversion pumps and/or berms may be used to remove standing water or divert flows to prepare a relatively dry work area. Depending on the area that needs to be repaired or replaced, a wire-mesh lining or rebar could be installed per as-built conditions or standard specifications over the exposed area to structurally tie into the existing concrete lining or form. If needed, crews can use a wheelbarrow or dump truck and bobcat to transfer existing in-channel or imported material/aggregate to backfill the work area to the appropriate grade. A concrete truck, typically stationed outside the channel, will then pump or spray concrete via hoses to the repair/replacement location. The concrete material used will be applied to meet standard specifications and formed to match the existing concrete lining or to match its original as-built condition. Any material removed will be loaded into dump trucks and taken to an approved off-site disposal location.

Riprap Replacement

Where existing channel riprap has been compromised and needs replacement, as shown on the as-built drawing or current design condition, the equipment used will include an excavator (with compaction wheel and/or bucket), loader, bobcats, dump trucks, and geofabric. The excavator or loader will begin by removing the existing riprap from the replacement location. Any material from the original riprap that could be reused will be set aside, and the rest of the material will be loaded

into dump trucks, along with any sediment removed from the bank or channel bottom to prepare the replacement area, and taken to the approved off-site disposal location. A geofabric may be installed over the entire area prior to the excavator or loader installing the new riprap over the replacement area to the approved as-built condition or original design standard.

2.3.3 ASSOCIATED ACTIVITIES AND BMPS

Associated activities and BMPs will be conducted in conjunction with the activities and methods listed previously, as needed. Most activities will require access and loading. Some activities may require stockpiling, but for most, loading may occur directly onto trucks that are driven off site. Temporary flow diversions will be required any time water flows preclude maintenance activities.

Existing and Temporary Access/Loading

Each FMP includes specific access points, routes, and loading areas for each of the facilities included in the MWMP. Access and loading locations were determined by using previous access routes selected to limit disturbance to adjacent properties, minimize impacts to biologically sensitive areas, and provide safe access for maintenance crews. In most cases, access will occur directly from existing ramps, adjacent streets/rights-of-way, or paved areas because of the urban locations of these facilities. In other cases, access will be taken from short dirt or paved driveways from nearby public streets. Access areas are also used as loading points where material is pushed, and equipment scoops and loads it into a dump truck or bin, or onto a stockpile area. Loading areas can be a centralized location or run the length of a facility (typically within the public right-of-way). Access and loading areas through properties not owned by the City requires appropriate permissions (see Section 4.1.4, Access Permissions and Notifications).

Access into the facilities for maintenance may occur in several ways depending on the maintenance methodology and type of equipment used. Primary access for equipment will be taken from concrete-lined or earthen ramps into the channel. When equipment is lowered into a facility from an adjacent staging area or public right-of-way (street), an access point may be used.

Where an existing ramp is not present or greater impacts will result using the ramp to access the maintenance area, a temporary ramp may be built for channel access using either approved fill material brought from off site or by collecting and contouring sediment from the channel itself. To build the temporary earthen ramp, a Gradall/excavator will be staged on the bank above the channel. The equipment will then be used to collect material from dump trucks to create the ramp in the channel (if using approved fill material brought from off site), or the arm of the excavator will be used to reach into the channel and the bucket used to shape the sediment already present in the channel into a suitable ramp for access. Note that the temporary ramp will only be created using existing channel sediment/spoils that will already have been removed through maintenance so that

no material below the as-built grade of the facility will be disturbed using this method. If there is not sufficient excess sediment present in the channel, approved fill material may be used to build the temporary ramp.

For the public's safety, many facilities will be secured by a chain-link fence with locked gates that typically lead to a ramp and into a channel. When there is no gate for access, crews may cut a portion of a chain-link fence for equipment access. When maintenance is complete, TSW crews will repair the fence or install a new secured gate as necessary. When there is no fence or obstruction adjacent to the channel, equipment may occasionally operate outside the channel or facility along existing access routes or paved/developed areas at the top of channel banks. All access points and routes will incorporate BMPs as identified in the *Water Pollution Control Plan* (WPCP).

Temporary Staging

Each FMP includes designated staging areas for storage of equipment and materials required for maintenance. Typically, staging areas are needed when equipment and/or materials cannot be easily transported to the project location daily. In these cases, equipment and/or materials could be kept at a designated staging area location overnight or for the duration of maintenance. Where feasible, existing disturbed or developed areas (i.e., street rights-of-way) are used for staging. Depending on the location of the staging area, it may be used for minor equipment maintenance (e.g., re-fueling). BMPs will be installed, inspected, and maintained as identified in the WPCP.

Temporary Stockpiling

If necessary, maintenance operations that will remove a large volume of soil or other materials will use temporary stockpile sites. The MWMP includes pre-identified stockpile areas, if one is required for an FMP. Stockpile sites are used to maximize the efficiency of channel excavation/vegetation removal or where materials need to be dewatered or processed (e.g., trash separation or solarization to kill pest species) prior to transport. BMPs will be installed, inspected, and maintained as identified in the WPCP. Appropriate permits from RWQCB and other regulatory agencies will be acquired for stockpile areas that could limit the duration and use of stockpile areas from a couple of days to several months.

Temporary Flow Diversion

When channel maintenance or other approved activity is planned within a facility carrying active flows, one of two temporary diversion methods may be implemented to prevent these flows from entering the maintenance area during work and impacting downstream water quality.

The first method will be to use sand bags, gravel bag berms, earthen berms, water-filled dam, or another type of check dam to passively isolate and direct flows around the maintenance area. This

method will contain flows within the channel limits and will not require the use of equipment. Once maintenance is completed within a particular section of the channel, the gravel bag berms, earthen berms, or check dams will be reoriented to allow work to occur in additional channel sections requiring maintenance while continuing to prevent flows from entering the maintenance area. This method requires that the channel be wide enough to allow for both downstream flow diversion and channel maintenance to occur simultaneously and without overlap.

In facilities where the first method is not practicable because of limited channel area, a high-line pump system may be installed to divert flows around the maintenance area. Using this method, downstream flows will be blocked at a location upstream of the maintenance area using a sand bag or gravel bag berm, earthen berm, water-filled dam, or another type of check dam. A gas-powered pump staged above the channel bank, where feasible, will be used to push flows through a high-line hose system, around the maintenance area, and downstream. An additional temporary berm may be placed at the downstream end of the work area to prevent flows from intruding into the work area from downstream (e.g., where a "backwater effect" is present). Where pumps are temporarily required to divert flows within the channel, appropriate BMPs will be installed and monitoring will be conducted for pollution prevention.

The sand/gravel bag berms will be installed across the width of the channel bottom, perpendicular to the flow of water. The sand/gravel bags will typically be stacked no higher than 2.5 feet, and no wider than 3 sand/gravel bag rows across (in depth). Impermeable bags or similar type of covering may also be installed with the sand/gravel bag berms to prevent flows from entering the work area. All diversion berms will be removed from the channel if rains or heavy flows, which could overwhelm the diversion system, are expected.

Post-Maintenance Erosion Control Measures

In some cases, erosion control measures may be required to mitigate erosive velocities flowing through areas where vegetation prior to maintenance provided some erosion protection that will be lost (either temporarily or longer) due to maintenance. The hydrology and hydraulic analysis identified areas where potentially erosive velocities occur. Where removal of vegetation is unavoidable to reduce flood risk, implementation of post-maintenance erosion control measures may be required. The *Hydrology and Hydraulics Technical Report for the MWMP* (Geosyntec, DMax, and Dudek 2019) identifies potential erosion control measures, including turf reinforced matting, coir mat, riprap, anchored brush wood fence and wooden check dam, chain-link fence or woven wire fence, or rock dam. The *Hydrology and Hydraulics Technical Report* also identifies a process for final selection of measures and site-specific design. It is anticipated that regulatory permits will be required prior to installation of new measures, and final selection/design will be approved through such permits.

Water Pollution Control Plan

The San Diego RWQCB adopted Order No. R9-2013-0001 (as amended by R9-2015-0001 and R9-2015-0100), NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, on May 8, 2013 (MS4 Permit). The MS4 Permit requires the City to implement effective BMPs to reduce discharges of pollutants in storm water from soil-disturbing activities originating from any maintenance or construction sites to the maximum extent practicable and effectively prohibit non-storm-water discharges into the MS4.

In January 2016, the City initiated updates to the 2012 Storm Water Standards Manual to comply with requirements under the MS4 and NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ [as amended by 2010-0014-DWQ and 2012-006-DWQ], NPDES Permit No. CAS000002) (Construction General Permit). The updated Storm Water Standards Manual became effective on October 1, 2018. As Section I.C.24 of the Construction General Permit states, "routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility" is not considered an activity covered under the Construction General Permit; therefore, the Storm Water Standards Manual is used as a reference to prepare a WPCP prior to implementation of an FMP or other MWMP maintenance to ensure that water quality is protected to the maximum extent practicable (SWRCB 2012).

The WPCP allows the City to systematically identify potential pollutants, including, but not limited to, disturbed or exposed bare soils, and the sensitivity of potential receiving waters (e.g., downstream 303[d]-listed impaired water bodies). Based on this assessment, BMPs are identified and located within the maintenance area, and responsibility is assigned to City staff for review and inspection of installation and ongoing effectiveness. BMPs may be required in the following categories (typical BMPs used during maintenance are listed in parentheses for each category):

- Erosion control (scheduling, stockpile management, soil binders, vegetation establishment, temporary check dams)
- Sediment control (gravel bags, fiber rolls, vegetation avoidance, street sweeping)
- Run-on and site storm water management (diversions, check dams, baker tanks, energy dissipators)
- Materials management (spill prevention, waste management, material storage, equipment maintenance)
- Non-storm-water management (equipment cleaning, spoils dewatering)
- Particulate and dust control (water truck)
- Final stabilization

For most FMPs, the working reference document WPCP (Appendix B) will be updated at the time of maintenance to provide a project-specific guide to control pollution. In addition to the City's Storm Water Standards Manual and working reference document WPCP, the California Storm Water Quality Association Construction BMP Handbook portal and California Department of Transportation's Construction Site Best Management Practices (BMPs) Manual are used as references. For structural maintenance and other minor activities involving less than 5,000 square feet of ground disturbance and a less than 5-foot elevation change over the entire activity area, a Minor WPCP may be prepared using Development Services Department (DSD) Form DS-570.

2.4 ENVIRONMENTAL PROTOCOLS

The following Environmental Protocols (EPs) have been identified as part of the proposed MWMP to specifically avoid, minimize, and/or reduce potential environmental impacts. Many of these have been previously described, but are called out below as they relate to each environmental resource area. EPs may include compliance with the SDMC or may have been developed as part of the environmental analysis and generally are applicable to all maintenance and repair activities, unless specific applicability is discussed in the protocol. The full text of the EPs is provided as Appendix C and will be attached to the Resolution approving the SDP/CDP. These EPs may also be incorporated into future regulatory permits.

Biology and Land Use

Biological and land use protocols provide compliance with the Multiple Species Conservation Program (MSCP) and include avoidance of direct disturbance of active nests during the bird breeding season; avoidance of indirect disturbance of active bird breeding behavior during the breeding season (e.g., noise attenuation and buffers); limitations on the use of lighting; environmental awareness training; demarcation of work limits to protect adjacent resources; and biological monitoring of vegetation removal, including specific requirements in areas supporting invasive plants species and/or shot-hole borer beetle.

Geologic Conditions

A protocol is included that requires preparation of a geotechnical report for maintenance and repair activities that involve earthen bank repair, in compliance with the LDC Section 142.0131.

Health and Safety/Hazards

A set of three protocols, including the *Hazardous Material Contingency Plan* prepared for the MWMP, provide specifications for where hazardous materials monitoring is required and the methods for monitoring; procedures for the identification and handling of soil or groundwater contaminants encountered during maintenance, including field screening and monitoring procedures; procedures

for managing contaminated or potentially contaminated soil stockpiles; waste characterization sampling procedures; and a description of potential soil recycling and reuse or disposal options.

Hydrology

As described in Section 2.3.3, Associated Activities and BMPs, hydrologic and hydraulic (H&H) analysis of proposed maintenance indicates that some locations may experience an increased potential for erosive velocities or other destabilizing effects. For these situations, the MWMP includes several post-maintenance erosion control measures (installation and maintenance methods are included in Appendix A-4) that will be used based on the design selection process outlined in the *Hydrology and Hydraulic Technical Report* (Appendix I of the MWMP EIR). Following the design selection process and any regulatory permit requirements, City crews or contractor(s) would install one or more of the measures, and the City would conduct monitoring.

Paleontological Resources

Paleontological resource protection includes monitoring by a qualified paleontologist in areas with a potential for encountering fossil resources during maintenance activities. Procedures for handling recovered fossil resources would be followed in accordance with the LDC Section 142.0151.

Solid Waste

A set of eight protocols, including the *Waste Management Plan* prepared for the MWMP, provide evaluation and methods to implement separation of recyclable materials, including tires, vegetation, and concrete debris, and diversion of these materials from the landfill.

Water Quality

Water quality protection measures are described in a WPCP, a working reference document that is provided as Appendix B to the MWMP. Water pollution control activities are outlined in Section 2.3.3, Associated Activities and BMPs. TSW and Development Services Department staff would determine if the WPCP, together with the FMP, provide sufficient detail to ensure adequate installation and maintenance of BMPs. This is expected to be the case for routine maintenance activities of a short duration (e.g., less than 1 month). On a case-by-case basis for larger maintenance efforts, project-specific WPCPs may be developed to better ensure that appropriate BMPs are installed and maintained during each round of maintenance.

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3 FACILITY EVALUATION AND DEVELOPMENT OF PROJECT AND PROGRAM ANALYSIS

As part of development of this MWMP, facilities and associated maintenance and repair activities were categorized based on two types of analysis: (1) a broad plan-wide or "programmatic-level" evaluation, or (2) a detailed, site-specific or "project-level" evaluation.

The programmatic or plan-wide analysis identifies potential impacts that could result from maintenance and repair activities for all storm water facilities City-wide, but that will require subsequent review for certain activities where the significance of an impact, as disclosed in the MWMP EIR, is not analyzed at the project or site-specific level. The programmatic or plan-wide analysis helps to address the goal of providing a comprehensive review of potential TSW operation and maintenance activities. It is also consistent with a permitting approach preferred by the regulatory agencies.

However, one of the principal goals of the MWMP is to identify, evaluate, and permit maintenance and repair activities for priority facilities so that these activities can be conducted on an as-needed basis through a streamlined environmental review and approval process. A project-level analysis at these site-specific facilities supports this goal. Therefore, this MWMP includes site-specific evaluations for a group of facilities where specific maintenance and repair activities are necessary to provide flood risk reduction and/or to ensure infrastructure longevity.

Appendix A is a compilation of FMPs, maintenance methods, and technical summaries that resulted from that analysis. Appendix A also includes a more detailed description of the facility selection and FMP design process, which is summarized in Section 3.1, Facility Selection.

3.1 FACILITY SELECTION

The 2016 and 2017 *Annual Drainage Channel Field Assessment and Maintenance Prioritization Projects* (Rick Engineering 2016, 2017) were used to determine which facilities would be analyzed for project-level and program-level activities. The field assessment ranked 187 channel segments (approximately 50 linear miles) for potential maintenance needs. The 187 channel segments were then reviewed by TSW field crews, engineering teams, and consultants. Following is a summary of the channel facilities selected for evaluation to determine if an FMP should be proposed.

Facilities are divided into three groups: (1) channels and ditches, (2) basins, and (3) structures. Each facility is assigned a facility group name that includes a reference to the drainage area (e.g., Green Valley Creek) and location (e.g., Pomerado). Where a facility has a change in channel substrate (earthen-bottom versus concrete-lined), crosses the Coastal Overlay Zone boundary, and/or crosses a four-lane or larger roadway, the facility is generally divided into segments (although some exceptions are made, especially

where substrate is mixed). Each segment is assigned a six-digit facility number that consists of three parts: a watershed number, drainage area number, and facility number.

A total of 69 facility groups (~~129~~ 127 segments) were identified for evaluation: channels and ditches (53 facility groups comprising ~~112~~ 110 segments) are listed in Table 2, and basins (6 facility groups comprising 7 segments) are listed in Table 3. The remaining 10 facility groups consist of 10 outlet/inlet structures. Appendix A provides more details regarding the facilities and activities considered for evaluation.

Channel/ditch facilities (26 miles total) (Table 2; Figure 3, City-Wide Overview/Index Map) were selected from the following three categories for the MWMP initial coverage:

1. All channels that have been maintained since 2010 and will continue to need maintenance (approximately 11 miles of channels)
2. Additional channels that are current high priorities for maintenance
3. Additional channels that are added based on one or more of the following:
    - Rick Engineering 2016 and 2017 assessments indicating moderate flood risk
    - TSW field staff experience/judgment, including review of service requests

Table 2
Channel and Ditch Facilities Evaluated for Potential Facility Maintenance Plan

Facility Number	Facility Group Name	Segment Name	Segment Number
San Dieguito River Watershed			
1-04-030	Green Valley Creek – Pomerado	Pomerado	1
1-04-033			2
Los Peñasquitos Watershed			
2-01-000	Los Peñasquitos Canyon Creek – Sorrento	Sorrento Valley	1
2-01-120	Los Peñasquitos Lagoon – Industrial	Industrial	1
2-01-122		Industrial	2
2-01-130	Los Peñasquitos Lagoon – Tripp	Tripp	1
2-01-200	Los Peñasquitos Canyon Creek – Black Mountain	Black Mountain	1
2-01-210			2
2-03-000	Soledad Canyon Creek – Sorrento	Roselle	1
2-03-002			2
2-03-004		SorValRd	1
2-03-006			2

Table 2
Channel and Ditch Facilities Evaluated for Potential Facility Maintenance Plan

Facility Number	Facility Group Name	Segment Name	Segment Number
2-03-012	Carroll Canyon Creek – Carroll	Carroll Canyon	1
2-03-100	Soledad Canyon Creek – Flintkote	Flintkote	1
2-03-150	Soledad Canyon Creek – Dunhill	Dunhill	1
2-05-140	Chicarita Creek – Via San Marco	Via San Marco	1
Mission Bay Watershed			
3-00-120	Torrey Pines – Torrey	Torrey Pines	1
3-02-101	Mission Bay – Mission Bay High School (MBHS)	Pacific Beach (PB)-Olney	1
3-02-103		MBHS	1
3-02-130	Mission Bay – Mission Bay Drive	Mission Bay Drive	1
3-03-901	Miramar – Engineer	Engineer	1
3-04-055	Tecolote Creek – Chateau	Chateau	1
3-04-250			2
3-04-101	Tecolote Creek – Morena	Morena	1
3-04-160	Tecolote Creek – Genesee	Genesee	1
San Diego River Watershed			
4-01-103	San Diego River – Nimitz	Nimitz	1
4-01-105			2
4-01-107			3
4-01-120	San Diego River – Valeta	Valeta	1
4-03-101	San Diego River – Camino del Rio	Camino del Arroyo	1
4-03-103		Camino del Rio	1
~~4-04-000~~	Murphy Canyon Creek – ~~Stadium~~Murphy Canyon	~~Stadium~~	~~1~~
~~4-04-002~~			~~2~~
4-04-006		Murphy Canyon	1
4-04-008			2
4-07-002	Alvarado Canyon Creek – Mission Gorge	Mission Gorge	1
4-07-004			2
4-07-009			3
4-07-011			4
4-07-021	Alvarado Canyon Creek – Alvarado	Alvarado	1
4-07-023			2
4-07-250			3
4-07-901	Murray Reservoir – Cowles Mountain	Cowles Mountain	1

Table 2
Channel and Ditch Facilities Evaluated for Potential Facility Maintenance Plan

Facility Number	Facility Group Name	Segment Name	Segment Number
4-07-911			2
4-08-008	Norfolk Canyon Creek – Fairmount	Fairmount	1
4-08-011			2
4-08-014			3
4-08-017			4
4-08-105		Baja	1
4-08-150		Aldine	1
Pueblo San Diego Watershed			
5-02-151	Washington Canyon Creek – Washington	Washington	1
5-02-153			2
5-02-162	Mission Hill Canyon Creek – Titus	Titus	1
5-03-011	Powerhouse Canyon Creek – Pershing	Pershing	1
5-03-100			2
5-03-901	San Diego Bay– 28th St	28th St	1
5-04-004	Chollas Creek – National	National	1
5-04-006			2
5-04-044	Chollas Creek – Rolando	Cartagena	1
5-04-046		Rolando	1
5-04-048			2
5-04-101	Chollas Creek– Martin	Martin	1
5-04-163	Chollas Creek – J St	J St	1
5-04-220	Auburn Creek – Home	Home	1
5-04-224			2
5-04-227			3
5-04-229			4
5-04-231			5
5-04-239	Auburn Creek – Wightman	Wightman	1
5-04-241			2
5-04-245	Auburn Creek – Oakcrest	Oakcrest	1
5-04-260	Chollas Creek– Megan	Megan	1
5-04-262			2
5-04-280	Chollas Creek – 54th St	54th St	1
5-05-006	South Chollas Creek – Southcrest	Alpha	1

Table 2
Channel and Ditch Facilities Evaluated for Potential Facility Maintenance Plan

Facility Number	Facility Group Name	Segment Name	Segment Number
5-05-008		Ocean View	1
5-05-019	South Chollas Creek – Euclid	Euclid	1
5-05-021			2
5-05-035	South Chollas Creek – Federal	Federal	1
5-05-037			2
5-05-205	South Chollas Creek Encanto Branch – Castana	Castana	1
5-05-304	South Chollas Creek Encanto Branch – Imperial	Imperial	1
5-05-306			2
5-05-603	South Chollas Creek Encanto Branch – Jamacha	Jamacha	1
5-05-606			2
5-05-610			3
5-05-702		Lobrico	1
5-05-802		Cadman	1
5-06-005	Paleta Creek – Cottonwood	Cottonwood	1
5-06-008			2
5-06-020	Paleta Creek – Solola	Solola	1
5-06-023			2
5-06-025		Cervantes	1
Sweetwater Watershed			
5-11-003	Sweetwater River – Parkside	Parkside	1
Otay Watershed			
5-22-008	Nestor Creek – Nestor	Cedar	1
5-22-010			2
5-22-013		Dahlia	1
5-22-016		Cerissa	1
5-22-023		Grove	1
5-22-028		30th St	1
5-22-110	Nestor Creek – Outer	Outer	1
5-22-112			2
Tijuana River Watershed			
6-01-020	Tijuana River – Pilot and Smuggler's	Pilot Channel	1
6-01-100		Smuggler's Gulch	1

Table 2
Channel and Ditch Facilities Evaluated for Potential Facility Maintenance Plan

Facility Number	Facility Group Name	Segment Name	Segment Number
6-02-115	Tijuana River – Tocayo	Tocayo	1
6-02-118			2
6-03-135	Tijuana River – Smythe	Via Encantadoras	1
6-03-138			2
6-03-143			3
6-03-147		Smythe	1
6-03-150		Via de la Bandola	1
6-06-011	Tijuana River – La Media	La Media	1

Table 3
Basin Facilities Evaluated for Potential Facility Maintenance Plan

Facility Number	Watershed	Facility Group Name	Segment Name	Segment Number
1-04-200	San Dieguito River	Green Valley Creek – Paseo del Verano	Paseo del Verano	1
2-01-900	Los Peñasquitos	Los Peñasquitos Canyon Creek – 5-805 Basin	5-805 Fwy	1
3-00-150	Mission Bay	Alta La Jolla – Vickie	Vickie	1
5-02-140	Pueblo San Diego	Maple Canyon Creek – Maple	Maple	1
6-04-251	Tijuana River	Spring Canyon Creek – Cactus	Cactus	1
6-04-253				2
6-05-110		Tijuana River – Siempre Viva	Siempre Viva	1

Table 4 provides a summary of the number of facility groups and segments analyzed within each watershed.

Table 4
Number of Channel/Ditch/Basin Facility Groups and Segments Evaluated per Watershed

Watersheds	Facility Groups	Segments
Channels and Ditches		
San Dieguito River	1	2

Table 4
Number of Channel/Ditch/Basin Facility Groups and Segments Evaluated per Watershed

Watersheds	Facility Groups	Segments
Los Peñasquitos	9	14
Mission Bay	7	9
San Diego River	8	~~25~~23
Pueblo San Diego	21	43
Sweetwater	1	1
Otay	2	8
Tijuana River	4	10
Total	**53**	**~~112~~110**
Basins		
San Dieguito River	1	1
Los Peñasquitos	1	1
Mission Bay	1	1
Pueblo San Diego	1	1
Tijuana River	2	3
Total	**6**	**7**

In addition, 10 outlet/inlet drain structures located within environmentally sensitive areas were evaluated to determine if an FMP should be proposed (Table 5). Those facilities were identified through the TSW staff evaluation of maintenance backlog, identified clogged outlet/inlet drain structures from the Canyon Sewer Outfall Assessment, and staff knowledge of historical or recent service calls/problem areas. This evaluation was completed in a qualitative fashion by Dudek and City staff reviewing the need for maintenance, City ability to conduct maintenance in terms of easements/ownership, ability to perform maintenance within minor maintenance thresholds, and the potential consequence of failure/flood risk.

Table 5
Structural Facilities Evaluated for Potential Facility Maintenance Plan

Infrastructure Asset Management Functional Location (IAMFLOC)	Watershed	Structure Name
HW04220	Los Peñasquitos	10405 Sorrento Valley Road
OT03537	San Diego River	1331 Washington
IN10399		1277 Camino Del Rio South
OT05573		5505 Friars Road

Table 5
Structural Facilities Evaluated for Potential Facility Maintenance Plan

Infrastructure Asset Management Functional Location (IAMFLOC)	Watershed	Structure Name
OT03321		1660 Hotel Circle North
HW02440		901 Hotel Circle South
HW02437		2087 Hotel Circle South
OT03694	Pueblo San Diego	3644 Roselawn
HW04013		4202 J Street
OT04671		1206 Goodyear

TSW also has an inventory of the following existing structures as defined by City Council Policy 800-004, storm drain pipes, brow ditches, box culverts, drainage structures (e.g., storm drain outlets, inlets, headwalls, cleanouts) within the public right-of-way, and permanent best management practice (BMP) facilities (e.g., bioretention basins, vegetated swales). Based on TSW staff experience and review of example facilities, maintenance of storm drain pipes, brow ditches, box culverts, and permanent BMPs (e.g., catch basin inserts, biofiltration areas) were not evaluated as potential FMPs because these facilities rarely support Environmentally Sensitive Lands (ESL), or maintenance of these facilities is generally not regulated by USACE, CDFW, RWQCB, CCC, or the City's DSD.

Appendix A of the MWMP provides more details regarding the facilities and activities considered for evaluation. In summary, a broad list of potential facilities with varying ranges of information on potential maintenance needs and history were first considered. It was determined that the majority of these facilities (e.g., outlets/inlets, storm drain pipes, BMPs, CIP projects) would not be carried forward for evaluation, primarily based on the following factors:

1. Maintenance and repair is not likely to result in an environmental impact (e.g., facilities within existing developed rights-of-way, such as storm drain pipes).
2. Maintenance and repair is already covered under a separate environmental document (e.g., environmental documents for CIP projects that cover construction and operation and maintenance).
3. Maintenance and repair is not likely to be needed based on lack of previous maintenance and infrequent occurrence of infrastructure failure, flooding, or other adverse conditions.

3.2 PROJECT-LEVEL ANALYSIS (FACILITY MAINTENANCE PLANS)

3.2.1 FMP DEVELOPMENT

Those facilities that were carried forward for a site-specific evaluation included a subset of the current MMP inventory of channels and basins that represent the highest priorities for maintenance and repair. Once a facility is determined to have the potential need for project-level maintenance, an internal design review is conducted to determine the potential for maintenance to achieve the following:

- Reducing flood risk.
- Avoiding and minimizing adverse hydraulic impacts (e.g., erosive velocities) within the maintenance areas and in the vicinity.

These determinations are made using varied H&H analyses and result in a maintenance recommendation. The results of the H&H analysis indicate if a flood risk reduction benefit can be obtained from implementation of maintenance activities, and what, if any, is the potential added risk for erosion. Additionally, the H&H analysis identifies facilities where potential infrastructure repair needs (e.g., repair of concrete lining) could occur, even if flood risk reduction benefits are not expected from maintenance. The maintenance recommendation is then evaluated through a collaborative process that consists of the following:

- TSW Planning staff and consultants provide an evaluation of regulatory requirements for each facility, taking into account current and past evaluations, permits, and mitigation under CEQA; local ordinances; and other laws and regulations, including the California Fish and Game Code, the California Endangered Species Act, the Porter-Cologne Water Quality Control Act, the California Coastal Act, the federal Endangered Species Act, and the Clean Water Act.
- TSW Engineering staff and consultants provide an evaluation of flood risk, including the consequence of flooding, erosion potential, and water quality conditions.
- TSW crews provide logistical and maintenance methodology details, an evaluation of feasibility, and costs.

This team of experts reviews a set of design considerations for each facility, which typically includes the following:

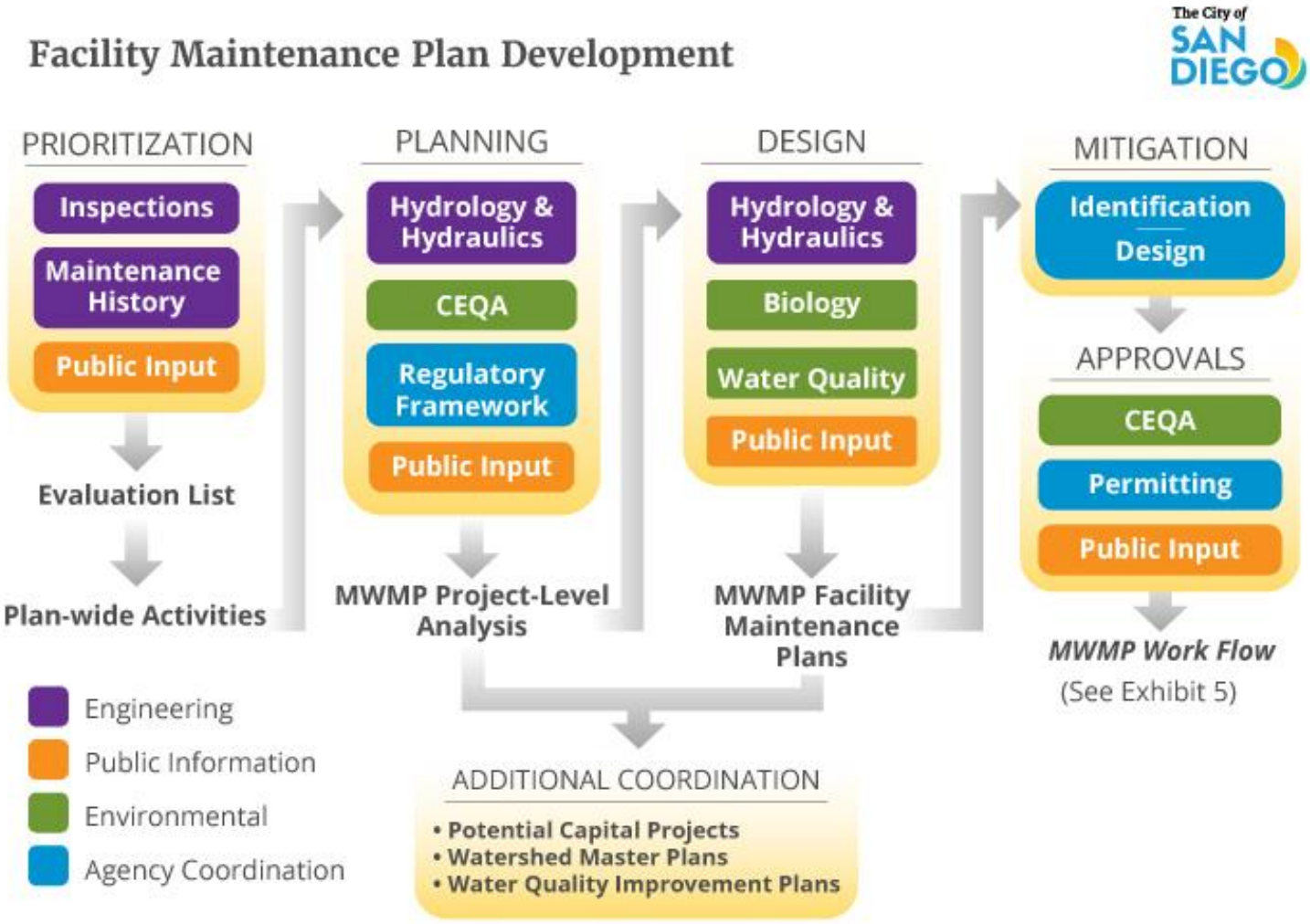
- No maintenance (i.e., current conveyance capacity and infrastructure stability is adequate).
- Recommended maintenance (i.e., engineering recommendations for improving conveyance capacity).

- Proposed maintenance (i.e., the proposed FMP, which takes into account environmental impacts and potential long-term infrastructure repair needs).

The proposed FMPs are based on the City's facility-specific evaluation of the benefits from maintenance in terms of flood risk reduction and environmental impacts. Each FMP includes a technical summary, maintenance methodology table, and FMP map. Each technical summary provides a description of the facility in terms of location; characteristics; maintenance history; regulatory history; and current H&H, biological, water quality, and historical conditions. Based on this evaluation, the City identifies a set of project activities and methods. An FMP map is developed to identify the location of these activities. A maintenance method table is provided to detail the methods used by City crews or the contractor to implement routine maintenance and repair (MWMP Appendices A-1 through A-3). In addition, generic FMPs provide details regarding methods to conduct concrete repair and post-maintenance erosion control measures, and can be used in conjunction with a site-specific FMP (MWMP Appendix A-4).

Since the FMPs include activities and methods that require evaluation under CEQA and, typically, several local, state, and federal regulations, the FMPs are modified to reflect the requirements of each regulatory approval. In addition, each round of maintenance conducted includes a verification process that may result in modifications to the current FMPs (see Chapter 4, Implementation Procedures). Exhibit 3 provides an overview of FMP development and post-FMP implementation, including identification of required mitigation, obtaining required approvals, and reference to an implementation process that is described in Chapter 4.

Exhibit 3
Facility Maintenance Plan Development



3.2.2 FACILITY RESEARCH

The following research was completed to better understand past construction and maintenance activities/designs, the current legal requirements, and the ability to conduct maintenance:

- Review of existing as-built drawings that depict the facility area or associated infrastructure
- Review of previous maintenance plans and/or regulatory permits/approval documents
- Assessment of current parcel ownership
- Review of title reports ordered to determine the potential existence of drainage (or similar) easements for areas not owned by the City that were identified to create run-off and that do not have drainage easements indicated on as-built drawings (not completed for all segments)
- Review of existing storm drains, sewers, and other utilities

Each of these items is subject to further verification prior to maintenance (see Section 4.1, Pre-Maintenance Planning).

3.2.3 CHANNEL/DITCH ANALYSIS

3.2.3.1 Hydrology Analysis

The hydrology analysis (Geosyntec, DMax, and Dudek 2019) provides an estimate of the peak flow (i.e., amount/volume of water per second) that is expected during 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year frequency storm events for each facility segment. This flow rate, combined with the channel dimensions and existing sediment/vegetation conditions, helps to determine the conveyance capacity of the channel.

Previously completed studies were reviewed to compile peak flows, where available. The studies reviewed included the Federal Emergency Management Agency's *Flood Insurance Studies* from 2016 and 2012, *Annual Drainage Channel Field Assessment and Maintenance Prioritization Projects* (Rick Engineering 2016, 2017), and *Individual Hydrologic and Hydraulic Assessment Reports* prepared as part of the MMP process.

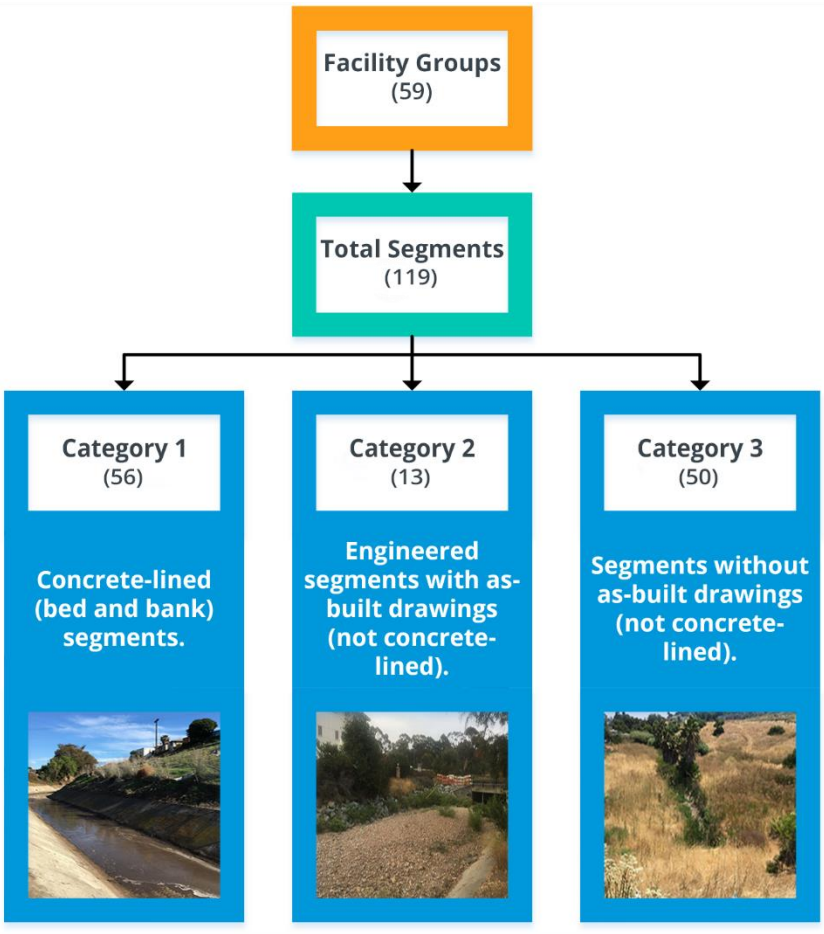
Where previous studies are not available, various methods of calculating hydrology based on the City of San Diego Drainage Design Manual, dated 2017 were used, with the most common methods being the rational/modified method and unit area method. In each of these cases, a 6-hour precipitation duration is used as part of the estimation.

3.2.3.2 Hydraulic Analysis

The hydraulic analysis provides an estimate of the velocity of water during 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year frequency storm events. These velocity and water surface elevations, combined with channel substrate conditions, helps determine the potential for erosion within the channels, and within upstream and downstream reaches, within the domain of analysis. The hydraulic analysis methods use the Manning's equation for open channel based on the City of San Diego Drainage Design Manual, dated 2017, and guidance from the *Southern California Coastal Water Research Project's Hydromodification Screening Tools* technical report (SCCWR 2010).

To determine the appropriate type of hydraulic analysis for each facility, each facility segment was placed into one of three categories. For this MWMP, the results are summarized in Exhibit 4.

Exhibit 4
Hydraulic Analysis Method Categorization



Category 1

This category includes concrete-lined channel segments and detention basins. These facilities have the lowest likelihood for erosion, given the hardened substrate within concrete-lined channel segments and controlled outlet/storage characteristics of detention basins. For these channels, a normal depth or simple Hydrologic Engineering Center–River Analysis System model is developed. With the hydraulic analysis, each Category 1 segment is analyzed to evaluate if current, pre-maintenance, or expected ultimate vegetation growth and sediment deposition has increased flood risk to surrounding properties and roadways compared with the original design capacity.

Category 2

This category includes engineered channel segments (which are not concrete lined) for which a recorded as-built drawing is available. The existence of a recorded as-built drawing indicates that the original design dimensions are likely to provide adequate conveyance capacity with adequately minimized risk of erosion. With the hydrology analysis, each Category 2 segment is analyzed to evaluate if current or expected ultimate vegetation growth and sediment deposition increased flood risk to surrounding properties and roadways compared with the design capacity.

Category 3

This category includes natural or created earthen-bottom channels without available as-built drawings. In these cases, no previous information exists for capacity or channel design. Detailed Hydrologic Engineering Center–River Analysis System models are developed for these channels to determine capacity, velocity, and resistance to erosive sheer stress.

3.2.4 BASIN ANALYSIS

San Diego Region Model BMP Design Manual (San Diego Copermittees 2018) states that the normal expected maintenance for storm water detention basins is to remove accumulated materials such as sediment, trash or debris; maintain vegetation health; and maintain integrity of side slopes, inlets, energy dissipators, and outlets. Based on this requirement it was established that the basin facilities need to be maintained. Maintenance of the basin facilities restores the basin to the original as-built condition, restores capacity, and in certain storm scenarios, reduces the potential for flooding.

The frequency of the maintenance is dependent on the capacity of the basin facilities. The two key features of the basin that determine its capacity are the volume of the basin and the performance of the outlet structure. Basin capacity decreases as sediment accumulates within it and vegetation growth increases. The outlet structure's performance is impacted by the amount of sediment and/or vegetation that accumulates around it, clogging the holes in the outlet structure. Therefore, analysis

of potential maintenance and repair for basins involved review of as-built information and current conditions to determine an appropriate threshold when maintenance or repair will be required.

3.2.5 HYDROLOGIC AND HYDRAULIC EVALUATION

The evaluation methodology to determine recommended maintenance, based on H&H analysis, is provided below for channels/ditches and basins. As part of the evaluation, but separate from the H&H maintenance and repair recommendations, a preliminary assessment of the need for a CIP project is also provided.

The H&H recommendations are based on available information at the time of the evaluation. Since most facilities evaluated occur in built-out, urban settings, the H&H analysis is not expected to change substantially over time. The existing, historical, expected future (e.g., ultimate vegetation condition), and recommended maintained conditions are considered, where appropriate. In general, where no recent maintenance has occurred, existing conditions represent an ultimate vegetation condition and provide a "worst-case scenario" for assessing potential maximum maintenance needs. Where recent maintenance was conducted, the pre-maintenance condition is used to determine potential maximum maintenance needs. Where the pre-maintenance condition was assessed prior to 2015, a current condition verification, based on recent site visit data, was conducted to ensure that the previous assessment adequately accounted for current and expected ultimate vegetation conditions. Factors that may result in a need for H&H re-evaluation include change in the facility site conditions (e.g., substantially more sediment deposition and/or vegetation growth above and beyond that anticipated under the MWMP H&H analysis, CIP implementation, development in the area) or change in watershed conditions/assumptions (e.g., land use, Federal Emergency Management Agency Flood Insurance Study).

3.2.5.1 Channel/Ditch Evaluation

An H&H recommendation is made for channels and ditches based on the potential for each channel/ditch facility to convey the expected storm water flow rates (i.e., level of service in terms of frequency storm event) and the potential for erosion. The level of service, or conveyance capacity, is evaluated under baseline, recommended, and ultimate conditions to determine if maintenance will reduce flood risk to surrounding properties. The baseline condition (i.e., the state of the facility before any maintenance is conducted) and the recommended maintenance condition were modeled for each segment. Depending on the category, the ultimate vegetation condition scenario was also modeled.

3.2.5.2 Basin Evaluation

An H&H recommendation for basins is made based on the location of the basin, basin type, and available as-built maintenance information. In general, the percentage of storage volume occupied

by sediment was measured by the sediment depth observed in the facility relative to an allowable sediment depth determined on a basin by basin basis. The allowable sediment depth was determined based on review of the as-built plans and other basin characteristics such as the height of the emergency spillway and/or outlet works above the bottom of the basin or the height of the sediment storage as designed. If the ratio of sediment depth to allowable sediment depth exceeds these thresholds, maintenance is recommended to reestablish the as-built conditions of the facility. The thresholds are as follows:

- For basins with maintenance thresholds documented in the as-built information, the determination of when maintenance needs to be performed will be based on the as-built maintenance requirements.
- For a desilting basin without a forebay, sediment/debris removal (and bottom re-grade) is recommended when the accumulated sediment volume reaches 50% of the designated sediment storage volume.
- For a desilting basin with a forebay, sediment/debris removal (and bottom re-grade) is recommended when the accumulated sediment volume reaches 25% of the designated sediment storage volume.
- For detention basins, sediment/debris removal (and bottom re-grade) is recommended approximately every 10 years or when the accumulated sediment volume reaches 10% of the detention basin storage volume.

The maintenance thresholds follow the *California Stormwater Quality Association's California Stormwater BMP Handbooks* (CASQA 2003, 2012) for permanent desilting basins and permanent detention basins for basins without as-built maintenance information.

3.2.6 PROPOSED FMPS

If the results of the H&H analysis indicate a flood risk reduction benefit from implementation of maintenance activities and the avoidance of significant potential for erosion, an FMP is developed. Additionally, some FMPs were developed to address potential infrastructure repair needs (e.g., repair of concrete lining), even if flood risk reduction benefits are not expected from maintenance.

For the project-level evaluation, the MWMP includes 66 FMPs (covering ~~113~~ 111 segments and approximately 18 linear miles) that were developed and include the following:

- 50 channel/ditch groups – ~~96~~ 94 segments (selected from Table 2 and provided as Appendix A-1)
- 6 basin groups – 7 segments (includes all facilities listed in Table 3 and provided as Appendix A-2)

- 10 structure groups covering 10 structures (includes all facilities listed in Table 5 and provided as Appendix A-3)

These facilities are listed and described in Chapter 5, Summary of Maintenance Facilities. The FMPs for these facilities focus on routine sediment and vegetation maintenance methods and requirements; in addition, separate general FMPs were prepared to specifically address concrete repairs and post-maintenance erosion control installation and maintenance and these can be "added on" to a specific facility FMP where these additional activities/measures are required (Appendix A-4).

Within the remaining 16 segments, based on analysis at this time, maintenance is not expected to appreciably reduce flood risk, there is no significant infrastructure at risk, and/or environmental impacts associated with maintenance cannot be mitigated (Appendix A-5). Therefore, no project maintenance (i.e., FMP) is proposed based on the project-level analysis conducted to date. These facilities may still be subject to plan-wide activities that will be evaluated under a program-level analysis (e.g., see Section 3.3, Program-Level Analysis). This program-level analysis also addresses potential activities within additional facilities that were not evaluated under the MWMP but that are included in the City's current annual inspection (Appendix A-6).

3.3 PROGRAM-LEVEL ANALYSIS (OTHER PLAN-WIDE ACTIVITIES)

The program-level analysis focuses on the potential that activities could occur in all storm water facilities City-wide. The following sections discuss these activities:

- Section 3.3.1, Minor Maintenance or Repair – minor maintenance activities
- Section 3.3.2, Changed Conditions for New or Substantially Amended FMPs – routine maintenance and repair activities not identified in an FMP that are required due to changed conditions or new information and will require an amendment to the MWMP or permits
- Section 3.3.3, Compensatory Mitigation Sites
- Section 3.3.4, Emergency Maintenance or Repair

FMPs have been prepared for most anticipated maintenance and repair locations. These FMPs provide detailed information regarding planned activities and methods so that a project-level review can be conducted in accordance with CEQA and the City's SDP and CDP requirements. However, given the unpredictable nature of flooding, erosion, and drainage infrastructure failures, maintenance and repair activities and methods may be required in areas not identified in the FMPs. Figure 3 identifies the areas where most of the facilities that may be subject to these additional plan-wide activities occur. However, these activities may occur anywhere within the City limits.

3.3.1 MINOR MAINTENANCE OR REPAIR

Minor maintenance or repair activities may occur throughout the City but will not affect ESL (as defined by the LDC and as regulated by the City) or result in a regulated impact to resources under the jurisdiction of USACE, CDFW, RWQCB, or CCC. These activities may include maintenance of facilities such as storm water pipes, inlet/outlet structures, ditches, channels, brow ditches, basins, and permanent BMPs. These facilities are most often within the public right-of-way or developed areas. A variety of other activities may also be considered minor maintenance, including, trash and debris removal by hand, homeless encampment removal, graffiti removal, vegetation management, non-mechanized sediment removal, erosion control maintenance, and concrete repair (minor damage). However, all minor maintenance must meet the following criteria:

- No ESL impact (including wetland vegetation and covered species habitat) or otherwise exempt from an SDP
- Typically, no regulated impacts to jurisdictional resources (discharge of dredge/fill to waters of the United States/state or significant alteration of lake or streambed)
- Development activities do not impact coastal resources or are otherwise exempt from a CDP

3.3.2 CHANGED CONDITIONS FOR NEW OR SUBSTANTIALLY AMENDED FMPS

New FMPs may be prepared for facilities where no current FMP is included in Appendix A. FMP preparation is expected to be similar to the methodology outlined in this MWMP, including H&H analysis to determine flood risk reduction and erosion potential, followed by collaborative FMP development considering biological, water quality, and other potential environmental impacts.

Similarly, existing FMPs may require amendments to incorporate additional activities such as additional channel segments, bank repair, relocated staging or stockpile areas, or modified methods. Where these amendments have the potential to result in new or substantially more severe environmental impacts than what was anticipated, these FMPs will be considered substantially amended.

Section 4.2.1 provides further detail on the environmental review that will be required for each new FMP, including those substantially amended.

3.3.3 COMPENSATORY MITIGATION SITES

Compensatory mitigation sites are discussed in Section 4.3.2, Compensatory Mitigation Areas, and include those previously approved, those pending approvals, and potential future sites. Approvals of compensatory mitigation sites may be completed through amendments to this MWMP provided that the CEQA analysis for the MWMP adequately identified potential significant impacts and mitigation or the proposed mitigation is exempt from CEQA review.

3.3.4 EMERGENCY MAINTENANCE OR REPAIR

An emergency is defined as a sudden unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. Emergency maintenance activities may occur at any time throughout the City and may or may not affect ESL or result in a regulated impact to resources under the jurisdiction of USACE, CDFW, RWQCB, or CCC, depending on the location and nature of the emergency. Emergency maintenance is an activity that may be conducted any time the conditions within a particular facility pose a threat to life or property. Emergency authorizations will allow TSW to conduct the necessary maintenance or repair to the facility (not extending year to year, although limited exceptions may occur) and will be limited to the minimum activity necessary to alleviate the threat to life or property. Activities may include the removal of sediment, vegetation, debris, or other material from a facility to reduce or mitigate the immediate flood risk to life and property.

When emergency maintenance involves activities within wetlands and/or waters of the United States/state, appropriate notifications to regulatory agencies, according to the current procedures published by each agency, will be provided by TSW staff or their consultants. Email notifications are typically sent to agencies before the emergency activity occurs, and additional emergency notifications are sent to agencies using their notification procedures shortly after the emergency maintenance begins. The City has the option of taking unilateral action in proceeding with emergency maintenance or repair, but is encouraged to wait as long as possible to allow the agencies to provide input on the proposed emergency activities. If the maintenance start time can be delayed for more than 2 weeks, the imminent threat of impending loss may have diminished in magnitude and immediacy, and generally do not meet the definition of an “emergency.” Procedures outlined in this MWMP and typical for an FMP will be followed to the extent practicable (e.g., identifying the limits of work, environmental awareness training, biological monitoring, water quality BMP installation and inspection, archaeological/Native American monitoring).

Following maintenance, a post-maintenance report will be prepared to document the results of emergency maintenance activities and to determine the need for compensatory mitigation. After-the-fact permits and/or required documentation for the emergency may be required. The after-the-fact permit could be processed through the City via Substantial Conformance Review (SCR) Process One if the facility/activity is covered at the project-level and consistent with the MWMP EIR, SDP, and CDP; or SCR Process Two when the facility/activity is covered at the programmatic level and consistent with the MWMP EIR, SDP, and CDP. If the activity and/or facility is not covered by the MWMP EIR, SDP, or CDP, a subsequent environmental review and/or new or amended permits could be processed in accordance with LDC Section(s) 126.0113, 126.0504, and 126.0707. The after-the-fact permitting will therefore follow Table 7, DSD Subsequent MWMP Process Flow Chart, in Section 4, Implementation Procedures.

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4 IMPLEMENTATION PROCEDURES

Maintenance needs are identified through an annual inspection and prioritization process. The results of these inspections are reviewed against existing FMPs to determine if required maintenance can be performed consistent with existing FMPs or if a program-level analysis is required. Environmental protocols and mitigation measures are evaluated along with access permissions and required regulatory approvals and public outreach. If all required regulatory approvals and access permissions are obtained, maintenance is conducted in accordance with required implementation of mitigation measures. This section provides more details on procedures implemented prior to, during, and following maintenance. Please refer to Exhibit 5 for an outline of operations and maintenance procedures.

4.1 PRE-MAINTENANCE PLANNING

4.1.1 INSPECTIONS AND PRIORITIZATION

Routine maintenance and repair activities for MWMP program and project-level channels and ditches, basins, and structures are prioritized through a maintenance benefit analysis that includes annual inspections, public input, and a desktop H&H analysis. The following is a description of the City's proposed inspection and prioritization process.

Step 1: Annual Inspections

Typically, starting at the end of the rainy season (in April), the City and consultants visually inspect storm water facilities to determine the probability and consequence of flooding (see Table 6). The probability of flooding is determined from assessing factors such as the substrate's Manning's "n" value (roughness coefficient – channels and ditches only), structural damage and overall condition; as well as environmental factors such as erosion, ponded water and percentage of vegetation, trash and debris, and sediment deposition. Facilities with a large amount of vegetation, trash and debris, sediment deposition, ponded water, structural damage, and erosion have a higher probability of flooding due to the decrease in the facility's conveyance capacity or level of service. Although, native wetland vegetation and sediment filter many pollutants in our waterways, the removal of invasive vegetation, trash and debris, pollutant saturated sediment, and ponded water may benefit water quality. These secondary water quality benefits considered during the annual inspections are depicted in Table 6. Out of a total inspection score of 80 points, water quality factors account for a possible 14 points for channels, 20 points for basins, and 28 points for structures.

The consequence of flooding is determined from the potential impact of flooding to the surrounding land uses and infrastructure. Factors including the surrounding buildings and land uses (roadway, open space), housing density, and available freeboard are assessed during the annual inspection. Facilities

where flooding would impact high density areas, homes, major roadways, and critical buildings such as police stations, fire stations and hospitals would have a higher consequence of flooding than adjacent land uses such as parking lots, temporary uses, or open space.

Table 6
Inspection Score Factors

Channels	Basins	Structures	Points
Probability of Flooding Substrate type Erosion Trash/debris* Vegetation* Sediment deposition* Standing Water/Ponding* Noticeable Odors* Algae* Transients/ Encampments* Structural Issues Culvert conditions Flooding potential	**Probability of Flooding** Basin type Erosion Trash/debris* Vegetation* Sediment deposition* Standing Water/Ponding* Noticeable Odors* Algae* Transients/ Encampments* Structural Issues Outlet condition Flooding potential	**Probability of Flooding** Clogging Percentage Erosion Trash/debris* Sediment deposition* Structural Issues Flooding potential	40 pts
Consequence of Flooding Surrounding Infrastructure/Land Uses Freeboard Culvert/Channel Overflow Infrastructure Damage	**Consequence of Flooding** Surrounding Infrastructure/Land Uses Freeboard Culvert/Channel Overflow Infrastructure Damage	**Consequence of Flooding** Surrounding Infrastructure/Land Uses Freeboard Culvert/Channel Overflow Infrastructure Damage	40 pts

* Potential water quality benefit from removal.

Step 2: Public Input

While the annual inspections are being conducted, City staff will seek public input by reviewing service notification requests received during the year and distributing an online public survey. The Annual Inspections score (80 points) and Public Input score (10 points) will be added together to then rank an initial priority list. Based on this initial screening, only the channel and ditch facilities that pose the greatest flood risk based on the annual inspection and public input will be further analyzed. For basins and structures, conveyance capacity can be determined from the inspection process alone.

Step 3: H&H Analysis and Verification for Channel and Ditch Facilities

Further analysis through H&H modeling will then be conducted on the channels and ditches identified in Step 2 to determine the existing and maintained conveyance capacities (e.g., level of service). Since many channel and ditch facilities in the MWMP already have baseline H&H modeling completed, City staff will verify, from the inspection process, whether conditions are the same or have substantially changed. If the current conditions have substantially changed or if a facility does not have baseline H&H modeling data, a desktop H&H analysis will be conducted. H&H modeling is not performed for the basin or structure facilities since conveyance capacity can be determined from the inspection process. The top channel and ditch facilities are then reprioritized based on the probability of flooding (40 points), the consequence of flooding (40 points), public input (10 points), and maintenance capacity benefits determined from the H&H modeling (10 points).

Step 4: Final Prioritization List

The list of reprioritized facilities is then shared with the Environment Committee of the City Council. The final prioritization list is then published by the City and used as a tool to budget, and plan final engineering and environmental compliance, including identification of compensatory wetlands mitigation. The Environment Committee of the City Council meeting offers another forum for the public to provide input during this process.

This inspection and prioritization process may be modified to adaptively manage the City's needs based on public input; more efficient and comprehensive methodologies gained from the annual inspections; budgetary constraints; City priorities; and operational practices. Such modifications will be presented as part of the annual winter storm preparation briefing presented to the Environment Committee of the City Council.

4.1.2 MAINTENANCE DESIGN VERIFICATION

Based on the results of the annual inspections and prioritization, the City will determine if maintenance or repair can be conducted as minor maintenance, the prioritized facility already has a project-level FMP to conduct proposed maintenance and repair activities, or there is no FMP and one will need to be prepared to conduct work.

If any maintenance or repair can be done through minor maintenance (e.g., hand removal of trash and debris), TSW will conduct the work as needed.

If the prioritized facility has an FMP, TSW will prepare the site-specific maintenance plan and verify that the proposed work is in "substantial conformance" with the approved FMP and environmental analysis disclosed in the certified EIR. Review of existing FMPs will include verification of H&H conditions; project activity footprints (i.e., maintenance, access, loading, staging, and/or stockpiling

areas); current biological, water quality, and historic conditions; and regulatory approvals. This verification may be documented in a checklist or summary to be submitted to the agencies for subsequent authorizations/notifications (i.e., Substantial Conformance Review). If regulatory permits adequately address all proposed project activities, the proposed maintenance will be implemented according to required procedures and permit authorizations. If regulatory permits do not adequately address all proposed project activities, an amended FMP will be prepared.

If a new FMP or amended FMP is required for a prioritized facility, one will be prepared for that facility. FMP development is discussed in Section 3.2, Project-Level Analysis (Facility Maintenance Plans). If the new or amended FMP to be included in the MWMP requires a modification or an amendment to a regulatory permit, those modifications will be processed accordingly. Regulatory approvals will be obtained prior to implementing any of the proposed maintenance and repair activities for the new or amended FMP.

4.1.3 ENVIRONMENTAL PROTOCOLS, MITIGATION MEASURES, AND PERMIT REQUIREMENTS

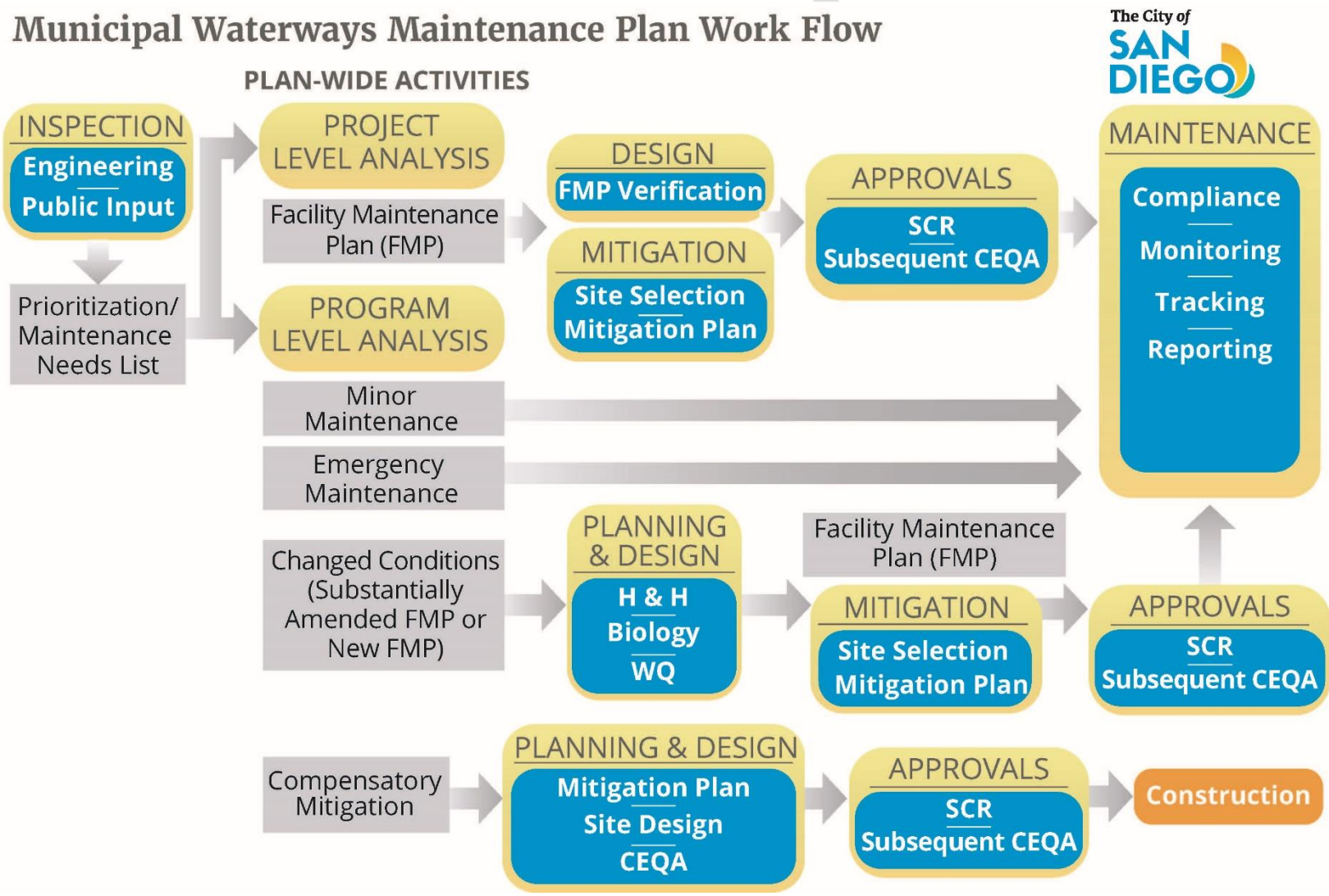
Environmental Protocols (EPs) were developed as part of this MWMP and are discussed in Section 2.4 and included in their entirety in Appendix C. Through the environmental review process, a set of mitigation measures (MM) will also be required. It is anticipated that the complete and final text of both the EPs and MMs will be part certified Final EIR and attached to the associated City Council Resolution. The City is also pursuing programmatic regulatory permits to authorize or streamline future authorization of activities proposed under this MWMP. These regulatory permits would contain additional requirements. Prior to implementation of maintenance or repairs, the City will review and ensure compliance with all application EP, MM, and regulatory permit requirements. These may include notifications, receipt of letters of authorization, approval of compensatory mitigation, and implantation of surveys and monitoring for sensitive resources, as examples.

4.1.4 ACCESS PERMISSIONS AND NOTIFICATIONS

City staff or their consultants will prepare and coordinate necessary right-of-entry permits or similar authorizations to conduct maintenance on lands not owned by the City but where the City may have an easement. An easement verification process will be completed using existing as-built drawings, assessor's maps, and if necessary, title reports. Appropriate notifications will be provided in accordance with easement requirements. Generally, where the City is not the underlying property owner and no drainage easements exist for conducting maintenance, the City will not conduct maintenance. Additionally, the City does not conduct maintenance within flowage easements. However, in some cases a right-of-entry will be requested.

Notifications will be provided in accordance with right-of-entry permit requirements to property owners of parcels within or adjoining proposed activity areas.

Exhibit 5
Municipal Waterways Maintenance Plan Workflow



4.1.5 PUBLIC OUTREACH AND INFORMATION

An annual presentation to the Environment Committee of the San Diego City Council will provide an overview of maintenance activities conducted during the past year and expected future maintenance. TSW will also offer to present this information at the Community Planners Committee.

The City's website will provide ongoing updates regarding the following:

- Preparation and finalization of annual prioritization
- Proposed FMPs (including associated technical reports and permits)
- An annual report of MWMP activities

4.2 RESOURCE AGENCY PERMITS AND AUTHORIZATIONS

The following is a general overview of regulatory requirements and permits expected to be issued by various agencies authorizing some or all of the FMP and related activities. These descriptions and details will be revised and amended, as necessary, during development and approval of the MWMP and subsequent FMPs.

4.2.1 CITY OF SAN DIEGO

As lead agency, the City's Planning Department has the authority to implement CEQA and is responsible for the environmental review and analysis of discretionary projects. Environmental review will be conducted in accordance with the City's adopted *California Environmental Quality Act Significance Determination Thresholds* (City of San Diego 2016). A project-level EIR analyzes the project's potential environmental impacts and includes appropriate site-specific measures and a mitigation framework for the program.

The activities described in the MWMP are subject to the SDMC, which contains administrative, criminal, and regulatory ordinances (or laws) for the City of San Diego. The SDMC is organized by chapters, articles, divisions, and sections.

Specifically, SDMC Chapters 11 through 14 are referred to as the "Land Development Code." These chapters contain the City's planning, zoning, subdivision, and building regulations. The LDC sets forth the procedures used in the application of land use regulations, the types of review of development, and the regulations that apply to the use and development of land in the City. The LDC contains implementing regulations for the City's *General Plan*, Community Plans, and Local Coastal Program (LCP).

The LDC includes ESL and coastal development regulations that require issuance of an SDP for projects located within ESL and/or a CDP for projects located within the City's jurisdictional Coastal Overlay Zone that may otherwise not be exempt.

The City has an approved LCP within its jurisdiction that meets the requirements of the California Coastal Act and implements the California Coastal Act's provisions and policies at the local level. The City's LCP is divided into separate geographic segments, each with separate land use plans. Within segments (or portions of segments) governed by adopted land use plans certified by the CCC, the City can issue CDPs authorizing MWMP activities that are in compliance with the LCP. In addition, the City must make certain findings in accordance with LDC Sections 126.0708(a) and 126.0708(b). A CDP issued by the City may be appealed to the CCC if located within an Appealable Area of the Coastal Zone or within 100 feet of CCC wetlands (California Coastal Act Section 30603[a][1]). Activities located within the CCC's permit jurisdiction or in the Deferred Certification Area shown on Map No. C-730.1 require a CDP from the CCC per the LDC.

In addition, the MWMP will be reviewed for compliance with all applicable City ordinances and adopted regulations and guidelines, including the following:

- SDMC
- LDC and Land Development Manual, including the following:
    - ESL Regulations
    - Coastal Development Permit Procedures
    - Historical Resources Regulations and Guidelines
    - Biology Guidelines
    - Storm Water Standards Manual
- *General Plan*
- Community, Subarea, Land Use, Park/Preserve, and Other City Area Plans
- *MSCP Subarea Plan* and Implementing Agreement
- *Climate Action Plan*
- MS4 NPDES Permit

The Public Facilities, Services, and Safety Element of the *General Plan* (City of San Diego 2015a) addresses specific goals and policies related to storm water infrastructure that can be achieved through implementation of the MWMP. The goals related to storm water include the following (City of San Diego 2015a):

- Protection of beneficial water resources through pollution prevention and interception efforts.

- A storm water conveyance system that effectively reduces pollutants in urban runoff and storm water to the maximum extent practicable.

The General Plan policies applicable to the MWMP include Public Facilities, Services, and Safety Element Policies PF-G.2, PF-G.3, PF-G.4, PF-G.5, and PF-G.6, and Conservation Element Policies CE-B.1.c, CE-B.2, CE-B.4, CE-C.1, CE-C.6, CE-G.1, CE-G.4, CE-G.5, CE-H.1, and CE-H.8 that relate to the preservation of open space, development within ESL, water quality protection measures, and preserving biological diversity, specifically wetlands.

Projects that involve earthen bank repair activities as described in the MWMP are also subject to compliance with LDC Section 142.0131. When earthen bank repair is necessary for a specific project, a geotechnical report will be required and prepared in accordance with the City's Guidelines for Geotechnical Reports (City of San Diego 2018), and the earthen bank repair design will incorporate the recommendations of the geotechnical report. The geotechnical report will also be submitted for review during the subsequent review process described below.

4.2.1.1 Subsequent Reviews and Approvals

The SDP and CDP will allow for implementation of the MWMP using the subsequent review process outlined in Table 7, DSD Subsequent MWMP Process Flow Chart. Subsequent activities outside the Coastal Overlay Zone that are analyzed at the project level will be authorized through SCR Process One. Subsequent review of MWMP activities located inside the Coastal Overlay Zone that are analyzed at the project level will be authorized through SCR Process Two to provide an opportunity for public appeal of the decision to the San Diego City Council and CCC. The SCR approval will be in effect for the duration of the work described in each submittal and would not expire for the activity authorized. TSW will make every effort to complete the maintenance or repair activity within the duration identified; however, environmental limitations, such as bird breeding season and rainy season, could delay completion of the maintenance. If site conditions (e.g., sediment deposition, vegetation/habitat) do not substantially change from the conditions that were described in the SCR, work may continue under the same authorization. However, if site conditions do substantially change (additional sediment deposition, new vegetation growth/habitat to be mitigated) from the time work stopped and work is to begin again, a new SCR will be submitted for re-authorization.

For activities that do not conform with approved FMPs (e.g., changed conditions leading to new or amended FMPs, compensatory mitigation sites, or emergency maintenance) where the environmental impacts of those activities are sufficiently addressed in the MWMP EIR, an SCR Process Two will be required. For activities not addressed in the MWMP EIR or facilities that need to be added to the MWMP, a separate review, likely under a separate or amended SDP/CDP, will be required in accordance with LDC Section(s) 126.0113, 126.0504, and 126.0707.

4.2.1.2 MHPA Boundary Line Adjustment Approvals for Mitigation Sites

The City's *MSCP Subarea Plan* contains the City's portion of the MSCP preserve, also known as the Multi-Habitat Planning Area (MHPA). Under the *MSCP Subarea Plan*, the boundary of the MHPA has been delineated to include areas identified as core biological resource areas and corridors targeted for conservation within the City. Through cooperation and agreements between the City, the resource agencies, and other constituents, future development and activities within the MHPA are limited by the LDC ESL regulations. These regulations and additional management requirements of the MSCP Implementing Agreement provide long-term site protection for lands within the MHPA (City of San Diego 1997).

As part of the MWMP, potential mitigation sites have been identified to provide compensatory mitigation for some or all of the impacts proposed at MWMP facilities (see Section 4.3, Compensatory Mitigation). For the resource agencies to approve these mitigation sites for use as compensatory mitigation, the mitigation sites must have protection in perpetuity to ensure the long-term viability of their resources and functions, in accordance with the San Diego Biology Guidelines. Since any mitigation site proposed under the MWMP would be within the City or County limits, and likely on City-owned land, an MHPA Boundary Line Adjustment (BLA) would be the proposed method to provide required long-term site protection and habitat management, if the mitigation site is not already located within the MHPA.

MWMP facilities proposed for maintenance may occur within the MHPA, but these facilities are essential public facilities that are an allowable and compatible use in the MHPA. Therefore, an MHPA BLA to conduct activities consistent with the MWMP is not required.

According to Section 1.1.1, Boundary Adjustments, of the *MSCP Subarea Plan*, proposed adjustments to the MHPA boundary may be approved without amending the *MSCP Subarea Plan* if the boundary change results in an area of "equivalent or higher biological value" being added (City of San Diego 1997). According to Section 5.4.2, Subarea Plan Amendments and Preserve Boundary Adjustment Process, of the County's *MSCP*, this comparison of biological value would be made "by the local jurisdiction [City] and must have the concurrence of the wildlife agencies" (County of San Diego 1998). The comparison of biological value would be based on the following biological factors (County of San Diego 1998):

- Effects on significantly and sufficiently conserved habitats (i.e., the exchange maintains or improves the conservation, configuration, or status of significantly or sufficiently conserved habitats, as defined in Section 4.2.4 [of the County MSCP]);
- Effects to covered species (i.e., the exchange maintains or increases the conservation of covered species);

- Effects on habitat linkages and function of preserve areas (i.e., the exchange maintains or improves a habitat linkage or wildlife corridor);
- Effects on preserve configuration and management (i.e., the exchange results in similar or improved management efficiency and/or protection for biological resources);
- Effects on ecotones or other conditions affecting species diversity (i.e., the exchange maintains topographic and structural diversity and habitat interfaces of the preserve); and/or
- Effects to species of concern not on the covered species list (i.e., the exchange does not significantly increase the likelihood that an uncovered species will meet the criteria for listing under either the federal or state Endangered Species Acts).

Any MHPA BLA associated with a proposed MWMP mitigation site would be considered under an SCR Process Two (see Table 7) and a CEQA Section 15162 Consistency Evaluation. For mitigation sites that cannot be processed through an SCR Process Two decision, the MHPA BLA would follow the current review and process requirements for an MHPA BLA that would impact and deviate from the ESL Regulations. A public notice would also be posted and sent to interested parties to allow the opportunity for comment, as required by the City's MSCP Implementing Agreement. Following the equivalency analysis cited above and receiving wildlife agency (i.e., USFWS and CDFW) concurrence of the MHPA BLA addition, the MHPA BLA would undergo CEQA Section 15162 Consistency Evaluation (or other CEQA documentation) and be noticed for a public comment period. The MHPA BLA approval would be issued through an SCR verification by the Development Services Department Project Manager. However, this approval may still be appealed to City Council, at which time an appeal hearing would be scheduled. A Resolution for the MHPA BLA approval would be prepared and recorded with the San Diego County Recorder/Assessor Office. Since the City's LDC does not explicitly require or define a process of approval for MHPA BLAs, this modified decision process for future MHPA BLAs needed for compensatory mitigation sites for MWMP activities would be codified via an Ordinance to be approved with the MWMP.

4.2.1.3 Other Authorizations

Minor maintenance is described above as being limited to activities that do not require discretionary approval or environmental review, and, therefore, will continue as is current practice. Minor maintenance activities are included in this project description and in the MWMP to comprehensively address storm water infrastructure maintenance and repair activities. Emergency activities may be initially authorized through established emergency procedures but will require after-the-fact approvals in accordance with the appropriate process for that activity/facility.

Local government-issued CDPs do not automatically satisfy federal consistency; therefore, the City will need concurrence with a consistency certification or a staff-issued waiver of the federal consistency

provisions from the CCC. In instances where locally issued CDPs are appealable (e.g., most coastal activities that require a 404 permit), the CCC's federal consistency unit will usually issue a waiver.

Coastal municipalities with approved LCPs that determine that a portion of their storm water and flood control facility maintenance activities are exempt from the need for a permit still need to provide evidence of California Coastal Management Program-compliance to USACE. This can be met by obtaining concurrence with a consistency certification or a staff-issued waiver from the CCC, as noted above.

The CZMA does not include specifications for obtaining CCC concurrence with a consistency certification or CCC staff-issued waivers on a programmatic level. However, the federal consistency unit of the CCC reviews the numerous activities for which a USACE Regional General Permit is being sought and the corresponding CDP(s) or exemption(s), and concur or issue waivers accordingly. USACE cannot issue its 404 Permit for fill in coastal waters until evidence of California Coastal Management Program compliance is provided.

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Table 7
DSD Subsequent MWMP Process Flow Chart

Step 1: Was the subsequent activity analyzed at the project level in the MWMP EIR and covered by associated Permits? If YES, go to Step 2. If NO, go to Step 4.							
Step 2: Does the subsequent activity encroach into ESL? If YES, go to Step 3 for projects outside the Coastal Zone. For projects within the Coastal Zone, go to Step 4. If NO, DSD review is not required but work may be authorized by TSW Environmental Planning & Permitting Group staff.							
Step 3: Determine Activity/Project and Subsequent Review Process.							
Activity/Project Type		**COVERED BY MWMP EIR, SDP, and CDP**			**NOT COVERED UNDER MWMP Program EIR, SDP, and CDP**		
Subsequent DSD Approval Process			SCR Process 1	SCR Process 2	Process 4 SDP/CDP[2]	Process 4 SDP/CDP[2]	Process 4 SDP/CDP[2]
Subsequent CEQA Analysis		No DSD Review	CEQA 15162 Consistency Evaluation	CEQA 15162 Consistency Evaluation/Tiered Environmental Document	NOE (Statutory)	NOE+NORA (Categorical)	MND/EIR
A	Maintenance of drainage conveyance facility (e.g., earthen-bottom and concrete-lined channels, culverts, and brow ditches)		X				
B	Maintenance of structural drainage facilities (e.g., outlets, headwalls, dissipaters, spillway)		X				
C	Maintenance of structural BMPs (e.g., vegetated swales, detention basins)		X				
D	Creation and/or maintenance of habitat-based mitigation (e.g., invasive removal, channel restoration)		X				
E	Approval of a Multiple Species Conservation Program / MHPA Boundary Line Adjustment			X			
F	Creation and/or maintenance of water quality improvement activities (e.g., treatment BMPs, hydromodification BMPs, alternative compliance)		X				
G	Minor Maintenance[1] – Regular maintenance of drainage conveyance facility, structural drainage facility, structural BMP, habitat-based mitigation, or water quality improvement activity and will not permanently impact ESL.	X					

1 Refer to LDC ESL Regulations, Section 143.0110(c), for development activities that do not require an SDP.
2 Or current decision process in accordance with LDC Section(s) 126.0113, 126.0504, and 126.0707.

Notes: BMP = best management practice; CDP = Coastal Development Permit; CEQA = California Environmental Quality Act; DSD = Development Services Department; EIR = Environmental Impact Report; ESL = Environmentally Sensitive Lands; MND = Mitigated Negative Declaration; NOE = Notice of Exemption; NORA = Notice of Right to Appeal; SCR = Substantial Conformance Review; SDP = Site Development Permit; TSW = Transportation & Storm Water Department; MWMP = Municipal Waterways Maintenance Plan.

Table 7
DSD Subsequent MWMP Process Flow Chart

Step 4: Was the subsequent activity included in the MWMP EIR and either (1) occurs within the Coastal Zone; or (2) is covered by associated permits at a programmatic level only? If YES, go to Step 5. If NO, go to Step 7.							
Step 5: Does the subsequent project encroach into ESL? If YES, go to Step 6. If NO, DSD review is not required, but work may be authorized by TSW Environmental Planning & Permitting Group staff.							
Step 6: Determine Activity Type and Process.							
Activity/Project Type		**COVERED BY MWMP EIR, SDP, and CDP**			**NOT COVERED UNDER MWMP Program EIR, SDP, and CDP**		
Subsequent DSD Approval Process			SCR Process 1	SCR Process 2	Process 4 SDP/CDP[2]	Process 4 SDP/CDP[2]	Process 4 SDP/CDP[2]
Subsequent CEQA Analysis		No DSD Review	CEQA 15162 Consistency Evaluation	CEQA 15162 Consistency Evaluation/Tiered Environmental Document	NOE (Statutory)	NOE+NORA (Categorical)	MND/ EIR
A	Maintenance of drainage conveyance facility (e.g., earthen-bottom and concrete-lined channels, culverts, and brow ditches)			X			
B	Maintenance of structural drainage facilities (e.g., outlets, headwalls, dissipaters, spillway)			X			
C	Maintenance of structural BMPs (e.g., vegetated swales, detention basins)			X			
D	Creation and/or maintenance of habitat-based mitigation (e.g., invasive removal, channel restoration); and/or an approval of a Multiple Species Conservation Program / MHPA Boundary Line Adjustment			X			
E	Creation and/or maintenance of water quality improvement activities (e.g., treatment BMPs, hydromodification BMPs, alternative compliance)			X			
F	Minor Maintenance[1] – Regular maintenance of drainage conveyance facility, structural drainage facility, structural BMP, habitat-based mitigation, or water quality improvement activity and will not permanently impact ESL.	X					

[1] Refer to LDC ESL Regulations, Section 143.0110(c), for development activities that do not require an SDP
[2] Or current decision process in accordance with LDC Section(s) 126.0113, 126.0504, and 126.0707.

Notes: BMP = best management practice; CDP = Coastal Development Permit; CEQA = California Environmental Quality Act; DSD = Development Services Department; EIR = Environmental Impact Report; ESL = Environmentally Sensitive Lands; MND = Mitigated Negative Declaration; NOE = Notice of Exemption; NORA = Notice of Right to Appeal; SCR = Substantial Conformance Review; SDP = Site Development Permit; TSW = Transportation & Storm Water Department; MWMP = Municipal Waterways Maintenance Plan.

Table 7
DSD Subsequent MWMP Process Flow Chart

Step 7: Was the subsequent activity or facility NOT included in the MWMP EIR and/or covered by associated permits (i.e., SDP or CDP) at a project or programmatic level; or is NOT covered by another CEQA document and/or permit? If YES, go to Step 8. If NO, a discretionary permit and CEQA evaluation may be required for the project.							
Step 8: Does the subsequent project impact ESL and deviate from ESL Regulations -or- otherwise require a CDP? If YES, go to Step 9. If NO, DSD review is not required but work may be authorized by TSW Environmental Planning & Permitting Group staff.							
Step 9: Determine Activity Type and Process.							
Activity/Project Type		**COVERED BY MWMP EIR, SDP, and CDP**			**NOT COVERED UNDER MWMP Program EIR, SDP, and CDP**		
Subsequent DSD Approval Process			Process 1	Process 2	Process 4 SDP/CDP or Amended SDP/CDP[2]	Process 4 SDP/CDP or Amended SDP/CDP[2]	Process 4 SDP/ CDP or Amended CDP[2]
Subsequent CEQA Analysis		No DSD Review	CEQA 15162 Consistency Evaluation	CEQA 15162 Consistency Evaluation/Tiered Environmental Document	NOE (Statutory)	NOE+NORA (Categorical)	MND/EIR or CEQA 15162 Consistency Evaluation/Tiered Environmental Document
A	Maintenance of drainage conveyance facility (e.g., earthen-bottom and concrete-lined channels, culverts, and brow ditches) using mechanized equipment						X
B	Maintenance of structural drainage facilities (e.g., outlets, headwalls, dissipaters, spillway) using mechanized equipment					X	X
C	Maintenance of structural BMPs (e.g., vegetated swales, detention basins) using mechanized equipment					X	
D	Creation and/or maintenance of habitat-based mitigation (e.g., invasive removal, channel restoration) using mechanized equipment and/or hand tools; and/or an approval of a Multiple Species Conservation Program / MHPA Boundary Line Adjustment					X	X
E	Creation and/or maintenance of water quality improvement activities (e.g., treatment BMPs, hydromodification BMPs, alternative compliance) using mechanized equipment and/or hand tools					X	X
F	Minor Maintenance[1] – Regular maintenance of drainage conveyance facility, structural drainage facility, structural BMP, habitat-based mitigation, or water quality improvement activity and will not permanently impact ESL.	X					

[1] Refer to LDC ESL Regulations, Section 143.0110(c), for development activities that do not require an SDP.
[2] Or current decision process in accordance with LDC Section(s) 126.0113, 126.0504, and 126.0707.

Notes: BMP = best management practice; CDP = Coastal Development Permit; CEQA = California Environmental Quality Act; DSD = Development Services Department; EIR = Environmental Impact Report; ESL = Environmentally Sensitive Lands; MND = Mitigated Negative Declaration; NOE = Notice of Exemption; NORA = Notice of Right to Appeal; SCR = Substantial Conformance Review; SDP = Site Development Permit; TSW = Transportation & Storm Water Department; MWMP = Municipal Waterways Maintenance Plan.

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4.2.2 CALIFORNIA COASTAL COMMISSION

The CCC's mission is the protection and enhancement of California's coast and ocean through regulation of the use of land and water in the Coastal Zone. The CCC retains coastal permit jurisdiction of all areas subject to tidal influence, for development on public trust lands, or for municipalities that have not developed their own LCP. Municipalities with LCPs may issue their own CDPs (or exemptions) for development and maintenance and repair activities that occur within the Coastal Zone but outside of the CCC's permit jurisdiction. However, the CCC may appeal CDPs issued by a municipality if the development will affect an Environmentally Sensitive Habitat Area[1] or wetlands, or it is within an "appealable area." Specific to wetlands, the limits of appeal jurisdiction are specified in the California Coastal Act Section 30603[a][1], as being within 100 feet of any wetland, estuary, or stream. Since the City has an adopted and certified LCP, it can issue its own coastal permits for areas under its jurisdiction. However, areas of deferred certification also exist within LCP segments. The CCC retains permit jurisdiction in areas of deferred certification or Coastal Commission Permit designation and will issue its own permit.

Coastal permits can be obtained individually for each maintenance or repair project. However, maintenance and repair of multiple, similar sites can alternatively be collectively included in one master application package. This state agency may also consider approval of a *Public Works Plan* for more complex, long-range, phased programs.

The MWMP includes proposed FMPs at 13 channel facility groups that occur in the Coastal Zone (see Chapter 5 for more details). These occur within five adopted LCP land use plans that were certified by the CCC (Torrey Pines, Pacific Beach, Peninsula, Otay Mesa-Nestor, and Tijuana River Valley). The CDP approval process will be determined following verification of City versus CCC permit jurisdiction (i.e., deferred certification areas) for each proposed FMP area. Two separate CDPs will be issued—one from the City and one from the CCC—for specific facilities within their respective jurisdictions. The City-issued CDP will be appealable to the CCC for those facilities within appealable areas. The City will also pursue the CCC's concurrence for federal consistency through the 404 Permit process for the activities permitted under the City-issued CDP. Programmatic activities are not planned to be included in the initial City-issued CDP for the MWMP, but could be included in subsequent CDPs or an amended CDP when project-specific information (including location) is identified.

Pursuant to the Coastal Zone Management Act (CZMA), an applicant for a federal license or permit (e.g., a Section 404 permit) to conduct an activity affecting any land or water use or natural resource

[1] Section 30240 of the California Coastal Act provides for the protection of Environmentally Sensitive Habitat Areas and states that these areas shall be protected against significant disruption of habitat values, and only uses dependent on those resources shall be allowed. That policy also states development in adjacent areas shall be sited and designed to prevent impacts, and to be compatible with the continuance of the habitat (California Public Resources Code Section 30240).

of the Coastal Zone, must meet the federal consistency requirements of Section 307(c)(3)(A) of the CZMA. Under the California Coastal Management Program, the requirements of CZMA Section 307(c)(3)(A) can be met by receiving CCC-issued CDPs, which automatically satisfy federal consistency, and no further submittal is needed. The California Coastal Act constitutes California's coastal zone management program for purposes of the CZMA (California Public Resources Code Section 30008).

4.2.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

CDFW's mission is to "manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public" (CDFW 2017). Proposed MWMP activities have the potential to be regulated under the California Fish and Game Code, California Endangered Species Act, and California Natural Communities Conservation Act, all of which are administered by CDFW. Proposed MWMP activities are not anticipated to result in take of any state-listed species that are not also covered species under the MSCP, and, therefore, the MWMP will typically only require a streambed alteration agreement (SAA) from CDFW, pursuant to Section 1602 of the California Fish and Game Code, for any alteration of a lake or streambed. A 5-year SAA (or longer-term master SAA) will likely be used to address requirements for maintenance of facilities that have a history of routine channel maintenance and documented as-built drawings. The removal of minimal vegetation (insufficient to constitute habitat for native species) from a concrete-lined channel, as well as repair and replacement of concrete channel lining, does not typically require an SAA. Activities within earthen-bottom segments and the removal of stands of vegetation large enough to form habitat will require an SAA or master SAA.

The master SAA will also include requirements that provide for compliance with nesting bird regulations within the California Fish and Game Code, as well as California Endangered Species Act and *Natural Community Conservation Plan* compliance (the City's SDP also provides for California Endangered Species Act and *Natural Community Conservation Plan* compliance through compliance with the City's MSCP).

4.2.4 CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

RWQCB oversees several different permits and programs that may influence or have requirements for MWMP activities. RWQCB adopts basin plans that identify beneficial uses, water quality objectives, and implementation plans. The City's maintenance methods must generally be conducted using BMPs to minimize impacts to designated beneficial uses.

RWQCB issues an MS4 Permit every 5 years that guides operation of the MS4 systems in a manner that protects water quality by requiring certain construction BMPs that are also applicable to maintenance activities.

The only project-specific review and permit issuance that RWQCB requires is pursuant to the federal CWA Section 401 certification. For those activities with impacts to waters of the state that are not waters of the United States or are not regulated under the federal CWA, a Waste Discharge Requirement may be required pursuant to the Porter-Cologne Water Quality Control Act. These permits are typically issued by RWQCB but may also be issued programmatically by the State Water Resources Control Board through general Waste Discharge Requirements. A water quality certification application, along with an initial fee and annual fees, is required. Typically, a separate water quality certification is also required for each Section 404 dredge-and-fill permit issued by USACE.

4.2.5 U.S. ARMY CORPS OF ENGINEERS

Pursuant to Section 404 of the CWA, USACE regulates the discharge of dredged and/or fill material into "waters of the United States." The term "wetlands" (a subset of waters) is defined in Title 33, Section 328.3(c), of the Code of Federal Regulations (CFR) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Section 328.3[c][4]). In the absence of wetlands, the limits of USACE jurisdiction in non-tidal waters, such as intermittent streams, extend to the "ordinary high water mark," which is defined in 33 CFR Section 328.3(c)(6).

USACE typically requires a Section 404 permit in situations when material (e.g., sandbags, check dams) is placed or discharged and/or equipment is operated within jurisdictional earthen-bottom channels. Activities limited to concrete-lined channels and/or excavation using equipment staged outside of jurisdictional waters often do not require a Section 404 permit, based on the Section 404(f)(1) maintenance exemption. This exemption allows for maintenance of "currently serviceable structures" where the removal of vegetation and/or sediment does not constitute a "modification that changes the character, scope, or size of the original fill design" (33 CFR Section 323.4[a][2]). Section 404 permits typically issued for maintenance include Nationwide Permits, Individual Permits, and Regional General Permits. While the Tijuana River and Smuggler's Gulch FMP is covered by an Individual Permit, the rest of the FMPs that require Section 404 authorization are proposed for inclusion in a Regional General Permit.

The Section 404 permit review process includes regulatory review of avoidance and minimization measures, compensatory mitigation for unavoidable impacts, Section 7 consultation with the USFWS, Section 106 consultation with the State Historic Preservation Office, and federal CZMA consistency with CCC.

4.2.6 U.S. FISH AND WILDLIFE SERVICE

As described previously, USFWS will typically consult with USACE during Section 7 review of any Section 404 permits that USACE issues for MWMP activities. In addition, USFWS is a signatory to the MSCP and provides review and oversight of MWMP compliance with the MSCP and Federal Endangered Species Act.

4.2.7 SUMMARY OF REGULATORY PERMITS AND AUTHORIZATIONS

Based on the proposed MWMP and applicable regulations and regulatory authority, as described above, the following is a summary of regulatory permits, authorizations, and consultations that will be required prior to implementation of the MWMP. Each regulatory permit review may result in modifications to the MWMP or may only authorize portions of the MWMP.

Local

- City of San Diego – SDP, CDP, and Ordinance

State

- CCC – CDP within areas of deferred certification and CCC permit jurisdiction, potential CDP appeal review, federal consistency determination
- CDFW – Master Streambed Alteration Agreement
- California RWQCB, San Diego Region – Water Quality Certification, Waste Discharge Requirement enrollment

Federal

- USACE – Regional General Permit
- USFWS – Section 7 Consultation
- State Historic Preservation Office – Section 106 Consultation

4.3 COMPENSATORY MITIGATION

4.3.1 APPROACH AND STRATEGIES

TSW uses all forms of available compensatory mitigation, including permittee-responsible mitigation, advance permittee–responsible mitigation, third-party mitigation banks, and, if available, in-lieu fee programs. TSW is actively investing in identifying potential wetlands

establishment/reestablishment, restoration/rehabilitation, enhancement, and preservation opportunities, particularly on City-owned land.

The following section provides a list of currently identified mitigation areas for each FMP. Additional mitigation projects may be used to mitigate MWMP facilities provided the mitigation meets all or a portion of associated permits and ESL requirements.

4.3.2 COMPENSATORY MITIGATION AREAS

All facilities with FMPs will either have identified compensatory mitigation, been previously permitted and mitigated, or will not require compensatory mitigation (e.g., unvegetated concrete-lined channels). Mitigation sites are listed and described below in terms of FMP impacts that have been or are planned to be mitigated at that site. More detail and maps are provided in Appendix F of the *Biological Resources Technical Report* (Dudek 2019). Mitigation sites are classified based on the following five groups:

- **Group 1 –** Mitigation sites that have been completed or are under construction (e.g., El Cuervo Mitigation Project, El Cuervo del Sur Phase I, Los Peñasquitos Phase I/Primary Enhancement Area, Famosa Slough Salt Marsh Mitigation, San Diego River [Stadium] Wetland Mitigation Project, Tijuana River Emergency Wetlands Creation Mitigation Project, Tijuana River Valley Enhancement Project)
- **Group 2 –** Mitigation sites currently proposed with draft Habitat Mitigation and Monitoring Plans (e.g., El Cuervo del Sur Phase II, Los Peñasquitos Phase II/Secondary Enhancement Area, Otay Reed, Hollister Quarry, 2015-16 Emergency Channel Maintenance Mitigation Project, Smythe and Via de la Bandola Channel Permittee Responsible Mitigation Project, Jamacha Canyon Rehabilitation Project)
- **Group 3** – Mitigation sites identified for potential future implementation, including sites that may be integrated, multi-benefit CIP projects (e.g., various sites identified in the Chollas Creek Watershed Master Plan and Chollas Creek Enhancement Program, Hollister Pond, Marron Valley, Otay Valley Regional Park, Sefton Field/Pueblo Lot 1102, Los Peñasquitos Lagoon Restoration, San Dieguito Lagoon East, Mission Bay Park Improvements, Shepard Canyon)
- **Group 4** – Credits for upland mitigation requirements (e.g., deduction of credits from the City's Marron Valley Cornerstone Mitigation Bank, payment into the City's Habitat Acquisition Fund)
- **Group 5** – Approved or potential third-party mitigation banks (e.g., Wildlands Inc. San Luis Rey and/or Rancho Jamul Mitigation Banks, Port of San Diego Pond 20 wetlands mitigation bank)

GROUP 1

El Cuervo Mitigation Project

The El Cuervo Mitigation Project has been completed by the City's Public Works Department (Engineering and Capital Projects Department at the time) as permittee-responsible mitigation for the impacts within Soledad Canyon Creek (Roselle segment 1). The impacts identified in the FMP for that facility are completely within the previously mitigated impact area. The El Cuervo Mitigation Project site consists of approximately 12 acres of wetland creation and enhancement riparian habitat, and approximately 4 acres of upland creation and enhancement Isocoma scrub habitat. The site is currently owned and operated by the City's Parks and Recreation Department.

San Diego River (Stadium) Wetland Mitigation Project

The San Diego River (Stadium) Wetlands Mitigation Project is an advance permittee-responsible mitigation site currently undergoing its first 5 years of monitoring by the City's Public Utilities Department. To date, mitigation credits (restoration and enhancement) have been released and secured by TSW to mitigate for impacts of Alvarado Canyon Creek (Alvarado and Mission Gorge segments); South Chollas Creek, MMP Map 101 (Federal segments); portions of Auburn Creek, MMP Maps 70 and 76 (Home segments 1 and 5); Norfolk Canyon Creek (Baja segment 1); and ~~Murphy Canyon Creek (Stadium segments)~~other segments not included in this MWMP.

Tijuana River Emergency Wetland Creation Mitigation Project

The Tijuana River Emergency Mitigation Project was completed by the City's Public Works Department (Engineering and Capital Projects Department at the time) as permittee-responsible mitigation for impacts of construction of the Pilot Channel (Tijuana River FMP). The site is currently managed by the County under a cooperative agreement with the City.

Tijuana River Valley Enhancement Project (In-Channel and Out-of-Channel)

The Tijuana River Valley Enhancement Project recently completed its 5 years of maintenance and monitoring, funded by TSW. The project provides permittee-responsible mitigation for impacts of maintenance of the Pilot Channel and Smuggler's Gulch (Tijuana River and Smuggler's Gulch FMP). The site is currently managed by the County under a cooperative agreement with the City.

GROUPS 1 and 2

El Cuervo del Sur

The El Cuervo del Sur Project consists of two phases. Phase I has been constructed by TSW, is currently in its 5-year monitoring period, and provides permittee-responsible creation and restoration mitigation for Soledad Canyon Creek (Flintkote and Roselle segment 2) and Mission Bay High School (City of San Diego 2015b). The site is also proposed as permittee-responsible creation and restoration mitigation for projects within the Los Peñasquitos watershed (such as the Tripp and Industrial channel/ditch segments), pending completion of all required After-the-Fact permits. Phase II of the El Cuervo del Sur Project is currently being planned to provide additional permittee-responsible creation mitigation acreage for current City channel maintenance activities, including the Carroll Canyon Culverts Emergency Maintenance Project, and for future maintenance projects. This Phase 2 Plan is currently in draft form and is undergoing further review and geotechnical investigation within the restoration area.

Los Peñasquitos Canyon Preserve Wetland Enhancement

The Los Peñasquitos Canyon Preserve Wetland Enhancement Project consists of two phases. Phase I is currently under construction by TSW and provides permittee-responsible enhancement mitigation for Soledad Canyon Creek (Flintkote and Roselle segment 2) and Mission Bay High School (City of San Diego 2015c). The site is also proposed as permittee-responsible creation and restoration mitigation for Peñasquitos (Tripp and Industrial), pending completion of all required After-the-Fact permits. Secondary enhancement areas were identified during the exotic species survey for the first phase of the project and a Phase II draft plan is being prepared to provide enhancement mitigation for future maintenance projects.

GROUP 2

Otay Reed

The Otay Reed mitigation site is an approximate 5-acre, City-owned parcel located within the Otay River Valley Regional Park along the Otay River, immediately west of Interstate (I-) 805 and south of Rancho Drive. The parcel is located partially within the MHPA of the City's *MSCP Subarea Plan* and an MHPA BLA is being processed for the entire Otay Reed site to be included in the MHPA. The proposed Otay Reed mitigation site will be an advance permittee-responsible mitigation for MWMP facilities and previous maintenance conducted within Nestor Creek, MMP Maps 131 and 133 (Cerissa and 30th segments), as well as one 2015–2016 emergency maintenance projects located in the Pueblo Watershed (Auburn Creek – Home 1 segment). Mitigation at the Otay Reed site will be achieved through the creation of wetland habitat in place of disturbed land and eucalyptus woodland; restoration of eucalyptus woodland,

disturbed wetland (arundo-dominated), and tamarisk scrub; and enhancement of southern willow scrub and mulefat scrub (City of San Diego 2017).

2015–2016 Emergency Channel Maintenance Mitigation Project

TSW has prepared a mitigation plan, currently under agency review, that will provide permittee-responsible mitigation for permanent impacts that already occurred and were permitted through emergency Regional General Permit 63 authorizations provided by USACE and RWQCB in Fiscal Year 2016 (July 2015–June 2016). If approved, this plan will provide complete or partial mitigation for FMP impacts at the following facilities:

- Washington Canyon Creek (Segments: Washington 1 and 2)
- Auburn Creek (Segments: Wightman 2, Home 1, and Home 5)
- Chollas Creek (Segments: Rolando 2, National, and Ocean View)
- South Chollas Creek, Encanto Branch (Segments: Jamacha 1)
- Paleta Creek (Segments: Cottonwood 1 and 2)
- Paradise Canyon Creek/Sweetwater River Tributary (Segment: Parkside)

The 2015–2016 Emergency Channel Maintenance Mitigation Project involved rehabilitation and/or enhancement on Washington Canyon Creek, Chollas Creek, South Chollas Creek, and Paradise Canyon Creek.

Smythe Channel and Via de la Bandola Permittee Responsible Mitigation Project

TSW has prepared a mitigation plan, currently under agency review, that will provide permittee-responsible mitigation for permanent impacts that were first permitted through emergency Regional General Permit 63 authorizations provided by USACE and RWQCB in Fiscal Year 2016 (July 2015–June 2016) for two segments within the Tijuana River – Smythe FMP (Via de la Bandola and Smythe segments).

Jamacha Flood Control and Restoration CIP

The Jamacha Flood Control and Restoration Project is a City CIP project being designed and permitted to provide advanced permittee-responsible wetland restoration (re-establishment and rehabilitation), enhancement, upland buffer, and preservation mitigation credits. The site is located between Imperial Avenue and Cadman Street within the City's Encanto and Skyline communities. The site is within an existing natural flood channel on land owned by the City that was acquired for the Encanto Expressway that was never constructed. The channel area and adjacent habitat include large stands of giant reed (*Arundo donax*), non-native grasslands, coast live oak

woodland, Diegan coastal sage scrub, and freshwater marsh that provide opportunities for potential mitigation areas (Dudek 2018).

Hollister Quarry

The Hollister Quarry mitigation site is a City-owned parcel that is entirely within the MHPA and Coastal Zone boundary. It is located east of Hollister Street, north of Palm Avenue, and south of Main Street. A conceptual Habitat Mitigation and Monitoring Plan has been drafted for the installation of advanced permittee-responsible mitigation in the form of both re-establishment and rehabilitation credits at the Hollister Quarry site (Helix 2018). If approved, this plan would provide complete mitigation for previous emergency impacts at Nestor Creek (Cedar segments 1 and 2). The area proposed for mitigation primarily consists of a disturbed wetland (arundo-dominated) and is adjacent to an existing riparian corridor. Riparian habitat (e.g., southern willow scrub) is present on the site and upstream and downstream of the mitigation areas.

GROUP 3

Mitigation sites categorized as Group 3 are areas that have been identified as containing potential opportunities for future mitigation based on an initial assessment(s) of the site conditions or planning-level analysis. No approved or draft mitigation plan has yet been prepared for these sites. Group 3 sites may contain potential for establishment/reestablishment, restoration/rehabilitation, enhancement, or preservation credits, or any combination of these mitigation types. Mitigation sites may be stand-alone projects or may be developed as part of an integrated, multi-benefit CIP project. There are currently 26 potential mitigation sites that have been identified and categorized as Group 3 (see Appendix F of the *Biological Technical Report for the MWMP* [Dudek 2019]). Additional sites could be added to this list through the programmatic process built into the MWMP.

GROUP 4

Marron Valley Cornerstone Lands Bank

The Marron Valley Cornerstone Lands Bank is located at the confluence of Cottonwood and Tecate creeks in one of the City's four Cornerstone Lands. Marron Valley is Phase 1 of a four-phase program the City entered with CDFW and USFWS, in conjunction with the City's MSCP. Approximately 900 credits (1 credit=1 acre) are available at this bank for upland Tier II (coastal sage scrub and coastal sage scrub/chaparral), Tier IIIA (mixed chaparral and chamise chaparral), and Tier IIIB (non-native grasslands). The valley also supports and has additional mitigation opportunities for native grasslands, vernal pools, and riparian woodlands.

GROUP 5

Mitigation sites categorized as Group 5 are third-party mitigation banks that would be potentially eligible to be used as credits for future impacts associated with the MWMP (e.g., Wildlands Inc., Rancho Jamul Mitigation Bank). Selection of bank credits would be based on the locations of the bank and the proposed impact, and would adhere to a watershed-based approach, to the maximum extent practicable.

4.4 REPORTING

Since maintenance is often targeted to occur during the non-breeding season to the extent feasible, the annual date for initiation of the maintenance period is designated as September 16. TSW will prepare an annual maintenance and monitoring report to summarize implementation of FMPs, any programmatic maintenance, and associated mitigation measures (including status of compensatory mitigation sites) for the previous year. A presentation regarding the previous year of maintenance will be made on an annual basis to the Environment Committee of the San Diego City Council and offered to the Community Planners Committee. In this presentation, TSW will also outline the maintenance planned to be carried out in the coming year. This same information will be provided to the appropriate state and federal agencies and included as an attachment to the City's MSCP Annual Report.

Annual Municipal Waterways Maintenance Plan Report

With respect to the past year of maintenance, the annual MWMP report will include the following:

- Tabular summary of the acreages of sensitive vegetation impacted at each facility that was maintained and the mitigation provided
- Scaled map of each affected storm water facility
- Updated master storm water facility list to reflect the facilities for which impacts have been mitigated and for which no additional mitigation will be required
- Summary of the status of mitigation that has been carried out during the current and previous years to mitigate for impacts to upland and wetland vegetation and sensitive species
- Digital date-stamped photograph of each area that was maintained in the reporting year

The annual MWMP report will not include minor maintenance activities that do not have any impacts that require mitigation.

Project Pre-, During, and Post-Maintenance Documentation

Following maintenance, a post-project maintenance record will be prepared by adjusting the project's FMP to match the post-maintenance field conditions. The post-maintenance record will be prepared to document conditions prior to, during, and after maintenance. The post-maintenance records will document any changes to the FMP (i.e., changes to the project's activity footprint, access, loading, staging, and/or stockpiling areas; or changes to the recommended BMPs as identified in the project's WPCP); identify actual amount of sediment/vegetation removed in (measured in tons). It will also include pre-, during, and post-maintenance photo-documentation prepared in compliance with regulatory permit reporting requirements.

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5 SUMMARY OF MAINTENANCE FACILITIES

As mentioned in Chapter 3, Facility Evaluation and Development of Project and Program Analysis, facilities and associated maintenance and repair activities were categorized based on two types of analysis: (1) a broad plan-wide or "programmatic-level" evaluation, or (2) a detailed, site-specific or "project-level" evaluation.

The programmatic or plan-wide analysis provides a broad, comprehensive review of the operation, repair, and maintenance activities that could potentially occur for all storm water facilities City-wide. The project-level analysis identifies, evaluates, and permits maintenance and repair activities for only 66 facility groups where specific routine maintenance and repair activities are necessary to provide flood risk reduction and/or to ensure infrastructure longevity.

This section provides a summary of the 66 facility groups, including individual project-level FMPs and proposed compensatory mitigation within each watershed (Figure 3). Appendix A includes the project-level analysis that was completed for each of the 69 facility groups (~~129~~ 127 segments). These facility groups are separated by type:

- Appendix A-1 includes channels and ditches (50 facility groups; ~~96~~ 94 segments)
- Appendix A-2 includes basins (6 facility groups; 7 segments)
- Appendix A-3 includes structures (10 structures)

A technical summary, FMP map, and maintenance table are provided for each facility group. In addition, a generic maintenance table describing methods for concrete repair and post-maintenance erosion control is included in Appendix A-4. Facilities that were analyzed for potential FMPs, but where no FMP is proposed under this MWMP, are documented in Appendix A-5 (16 segments). Facilities that are currently included in TSW's annual inspections but were not evaluated under the MWMP are listed in Appendix A-6.

Table 8 provides an overview of the number of facility groups and linear feet of channels/ditches, basins, and structures within each WMA and watershed. It should be noted that the entire length or area of maintenance does not accumulate with sediment, support vegetation, or may only support invasive species, but are included to address the potential need for concrete repair or for access.

Table 9 provides a list of all proposed FMPs for channels and ditches by watershed, substrate (i.e., concrete-lined versus earthen-bottom), and Coastal Zone. A facility number is included for each segment and corresponds with the order in which they are listed in Appendix A-1. Table 10 provides similar information for all proposed FMPs for basins (Appendix A-2). Table 11 provides similar information for all proposed FMPs for structures (i.e., outlets/inlets) (Appendix A-3).

The descriptions for each watershed below includes a summary of each of the facility group FMPs. Each MWMP facility (or portions of some facilities) is identified as either of the following:

- **Previously permitted** – Facilities where maintenance was previously approved and occurred under the MMP. For these sites, the extent of compensatory wetlands mitigation has previously been established, and based on the principle of one-time mitigation, will not require additional wetlands mitigation; OR
- **Newly proposed –** Facilities that have not been previously permitted or recently maintained.

Table 8
Municipal Waterways Maintenance Plan Proposed FMP Summary

Watersheds	Total		Channel/Ditch FMPs		Basin FMPs		Structural FMPs	
	Group FMPs	*Linear Feet (lf) and Acres (ac) of Maintenance*[1]	*Group FMPs*	*Linear Feet of Maintenance*[1]	*Group FMPs*	*Linear Feet (lf) or Acres (ac) of Maintenance*[1]	*Group FMPs*	*Linear Feet of Maintenance*[1]
San Dieguito River	2	4,241 lf + 0.29 ac	1	4,241	1	0.29 ac	—	—
Los Peñasquitos	10	9,291 lf + 1.44 ac	8	9,253	1	1.44 ac	1	38
Mission Bay	7	11,071 lf + 1.13 ac	6	11,071	1	1.13 ac	—	—
San Diego River	14	~~17,295~~15,427 lf	8	~~16,733~~14,865	—	—	6	562
Pueblo San Diego	24	27,427 lf + 0.12 ac	20	27,244	1	0.12 ac	3	183
Sweetwater	1	1,197 lf	1	1,197	—	—	—	—
Otay	2	5,497 lf	2	5,497	—	—	—	—
Tijuana River	6	19,074 lf	4	15,111	2	3,863 lf	—	—
TOTAL	**66**	**~~18.1~~17.8 miles + 2.98 acres**	**50**	**~~17.2~~16.9 miles**	**6**	**2.98 acres + 0.73 mile**	**10**	**0.15 mile**

FMP = Facility Maintenance Plan

[1] Linear feet and acres are approximate based on measurements made in GIS.

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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	Los Peñasquitos Lagoon – Industrial	Industrial	1	Earthen	Yes – CCC	Adjacent	25	285
2-01-122	Los 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

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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]
2-03-000	Soledad Canyon Creek – Sorrento	Roselle	1	Earthen	Yes – City	N/A	215	1,554
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	Partially Adjacent	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

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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]
3-03-901	Miramar – Engineer	Engineer	1	Concrete	—	N/A	1,220	1,220
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~~

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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]
~~4-04-002~~	~~Murphy Canyon Creek – Stadium~~	~~Stadium~~	~~2~~	~~Concrete~~	~~—~~	~~N/A~~	~~207~~	~~207~~
4-04-006	Murphy Canyon Creek – Murphy Canyon~~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

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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]
4-07-250	Alvarado Canyon Creek – Alvarado	Alvarado	3	Concrete	—	Partially Adjacent	517	517
4-07-901	Murray Reservoir – Cowles Mountain	Cowles Mountain	1	Concrete	—	N/A	697	697
4-07-911	Murray Reservoir – Cowles Mountain	Cowles Mountain	2	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

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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]
4-08-105	Norfolk Canyon Creek – Fairmount	Baja	1	Earthen and Concrete	—	Partially Adjacent	1,369	1,369
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

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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]
5-04-006	Chollas Creek – National	National	2	Concrete	—	N/A	2,743	2,743
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 9
Proposed Channel and Ditch Facility Maintenance Plans

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
5-05-205	South Chollas Creek Encanto	Castana	1	Earthen and Concrete	—	N/A	66	260

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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]
	Branch – Castana							
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 9
Proposed Channel and Ditch Facility Maintenance Plans

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 and Smuggler's	Pilot Channel	1	Earthen	Yes – City	Within	5,550	5,550

Table 9
Proposed Channel and Ditch Facility Maintenance Plans

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 and Smuggler's	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

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

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

Table 10
Basin Facility Maintenance Plans

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 Acreage/ Linear Feet[1]
1-04-200	San Dieguito River	Green Valley Creek – Paseo del Verano	Paseo del Verano	1	—	N/A	0.29 acres	0.29 acres
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	1.44 acres
3-00-150	Mission Bay	Alta La Jolla – Vickie	Vickie	1	—	Partially Adjacent	1.13 acres	1.13 acres
5-02-140	Pueblo San Diego	Maple Canyon Creek – Maple	Maple	1	—	N/A	0.12 acres	0.12 acres
6-04-251	Tijuana River	Spring Canyon Creek – Cactus	Cactus	1	—	N/A	229 linear feet	229 linear feet
6-04-253			Cactus	2	—	N/A	923 linear feet	923 linear feet
6-05-110		Tijuana River – Siempre Viva	Siempre Viva	1	—	N/A	2,711 linear feet	2,711 linear feet

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

Table 11
Structure Facility Maintenance Plans

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 Road	—	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

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

5.1 SAN DIEGUITO

The San Dieguito watershed (Table 12; Figure 3a, San Dieguito River Watershed) is located south of State Route (SR-) 78 and north of SR-56 in the northern portion of the City. The San Dieguito WMA encompasses 346 square miles of undeveloped open spaces and urban land uses extending from San Dieguito Lagoon in the west to the Volcan Mountains in the east. Two drainages within the San Dieguito watershed are included as FMPs, and both are in the community of Rancho Bernardo and contribute flows to Green Valley Creek, which outlets at Hodges Reservoir.

Table 12
FMP Summary – San Dieguito River Watershed

Number of Facility Group FMPs (Segments) Proposed	2 FMPs (3 segments/basins)
Maintenance Area Previously Permitted	0.0 acres
Maintenance Area Newly Proposed	3.9 acres

5.1.1 CHANNEL AND DITCH FACILITIES

Green Valley Creek – Pomerado is a concrete-lined channel in the community of Rancho Bernardo. This facility has no recent history of maintenance. Flooding has the potential to affect adjacent residential and commercial properties and roadways.

5.1.2 BASIN FACILITIES

Green Valley Creek – Paseo del Verano is a desilting basin located on the edge of the City limits that receives flows from the unincorporated County and is intended to capture sediment prior to discharge to a tributary to Green Valley Creek within the Oaks North Golf Course. This facility has no recent history of maintenance. Flooding has the potential to affect the Paseo del Verano roadway.

5.1.3 STRUCTURAL FACILITIES

No structural FMPs are proposed for this watershed.

5.2 LOS PEÑASQUITOS

The Los Peñasquitos watershed (Table 13; Figure 3b, Los Peñasquitos Watershed) is located at the northern portion of the City, west of SR-67 and north of SR-52. The Los Peñasquitos WMA encompasses 94 square miles of urban and open space land uses. Communities within this watershed include Mira Mesa and Rancho Peñasquitos in the eastern upper watershed and Carmel

Valley and Sorrento Valley in the western lower watershed. Facilities in this watershed include two tributaries to Los Peñasquitos Canyon Creek at Black Mountain Road, several facilities on or tributary to Soledad Canyon Creek, and two facilities that directly drain into Los Peñasquitos Lagoon.

Table 13
FMP Summary – Los Peñasquitos Watershed

Number of Facility Group FMPs (Segments) Proposed	10 FMPs (13 segments/basins/structures)
Maintenance Area Previously Permitted	7.5 acres
Maintenance Area Newly Proposed	2.1 acres

5.2.1 CHANNEL AND DITCH FACILITIES

Carroll Canyon Creek is a tributary to Soledad Canyon Creek, and maintenance is proposed to maintain a culvert under Carroll Canyon Road. This culvert was maintained in 2016 under an emergency and mitigation is being proposed at the El Cuervo Del Sur Phase II site. Flooding has the potential to affect adjacent commercial properties and Carrol Canyon Road, which was built as an Arizona crossing designed for floodwaters to flow over the roadway during high-flow conditions.

Chicarita Creek – Via San Marco is a concrete-lined channel that conveys runoff from west of Carmel Valley Road, east to I-15. Maintenance is proposed throughout the concrete-lined channel, primarily to address potential concrete repair needs. The drainage is an unnamed tributary to Chicarita Creek that occurs east of I-15 and flows south meeting Los Peñasquitos Canyon Creek. The channel is identified in an as-built drawing and has no recent maintenance history.

Los Peñasquitos Canyon Creek – Black Mountain includes two channels that are tributary to Los Peñasquitos Canyon Creek and occur along Black Mountain Road, adjacent to Canyonside Community Park and the Mohnike Adobe/horse stables. This facility has no recent history of maintenance. Segment 1 has no prior as-built drawings, and maintenance is proposed within a portion of the segment to restore a positive gradient between the upstream culvert outlet and downstream culvert. Flooding has the potential to affect adjacent property leased out by the City. An as-built drawing exists for Segment 2; maintenance is proposed within limited portions of the segment to remove accumulated sediment from engineered structures (energy dissipater and riprap drop structures) and thin vegetation to ensure positive drainage flow. Flooding has the potential to affect an adjacent parking lot serving a City park and community center.

Peñasquitos Lagoon Tributaries – **Industrial and Tripp** are concrete-lined ditches that convey flow through developed commercial lots from I-5 to culverts under Sorrento Valley Road. Industrial

has been broken into two segments for the MWMP: one that runs east to west on the east side of Sorrento Valley Road and one that runs south to north on the west side of the road. Industrial (segment 2) and Tripp (segment 1) were maintained in 2010, and mitigation for permanent impacts associated with maintenance have been approved through the After-the-Fact permits. Flooding has the potential to affect public roadways and adjacent commercial properties. The outlet/inlet structures of both ditches are expected to be improved as part of the future CIP lagoon restoration project. Both ditches are located in the Coastal Zone, within the Torrey Pines LCP.

Soledad Canyon Creek is a drainage located west of I-805. The earthen-bottom and concrete-lined segments of this channel have been subject to previous maintenance, and mitigation was provided for permanent impacts associated with maintenance. Flooding has the potential to affect public roadways, railway, and adjacent commercial and industrial properties. The FMP includes the entire concrete segment and approximately 100 linear feet of the earthen-bottom segment. A future CIP project is planned for the earthen-bottom segment and areas downstream to provide more effective sediment management, discharges of freshwater to the ocean, and restoration of salt marsh conditions within the downstream lagoon. All segments described here are located in the Coastal Zone, within the Torrey Pines LCP.

Soledad Canyon Creek – Dunhill and Flintkote are small tributaries of Soledad Canyon Creek within the Roselle business park. Dunhill is an earthen-bottom channel, and Flintkote is a concrete-lined ditch. Flintkote was recently maintained, and mitigation was provided for permanent impacts associated with maintenance. Flooding has the potential to affect public roadways and adjacent commercial properties. Both segments are located in the Coastal Zone, within the Torrey Pines LCP.

5.2.2 BASIN FACILITIES

Los Peñasquitos Canyon Creek – 5-805 Basin is an earthen-bottom basin that is located north of Sorrento Valley Boulevard, east of Vista Sorrento Parkway, and extends east and west adjacent to utility roads. This desilting basin was built in 2006 and mitigation was not required at the time of installation and is not expected to be required for future routine maintenance within the as-built basin footprint. Maintenance is proposed to alleviate flooding risk to downstream infrastructure and commercial properties along Vista Sorrento Parkway.

5.2.3 STRUCTURAL FACILITIES

10405 Sorrento Valley Road is an inlet structure (headwall/culvert entrance) that drains to the lower reach of Soledad Canyon Creek (Segment 1). The nearest intersection is Sorrento Valley Road and Carroll Canyon Road. This facility has no recent history of maintenance. There is sediment/debris deposition and a large piece on construction debris near the culvert entrance. This facility is located in the Coastal Zone, within the Torrey Pines LCP.

5.3 MISSION BAY

The Mission Bay watershed (Table 14; Figure 3c, Mission Bay Watershed) encompasses approximately 64 square miles of urban land and undeveloped open space extending from Mission Bay to east of I-15. The watershed includes La Jolla, Pacific Beach, University City, Clairemont Mesa, and Miramar. Rose Canyon, San Clemente Canyon, Tecolote Creek, and smaller canyons and urban drains carry runoff in this watershed downstream to Mission Bay and the Pacific Ocean (City of San Diego and Caltrans 2016).

Table 14
FMP Summary – Mission Bay Watershed

Number of Facility Group FMPs (Segments) Proposed	7 FMPs (9 segments/basins)
Maintenance Area Previously Permitted	2.7 acres
Maintenance Area Newly Proposed	4.8 acres

5.3.1 CHANNEL AND DITCH FACILITIES

Mission Bay Tributary – Mission Bay High School comprises two ditches located south of Grand Avenue: one that parallels Pacific Beach Drive, and one that extends perpendicularly northwest toward Quincy Street. The Pacific Beach/Olney segment parallels Pacific Beach Drive and is earthen-bottom. The Mission Bay High School segment is concrete-lined. Both segments have a history of recent maintenance and were mitigated as permanent impacts. Flooding of the segments has the potential to affect public roadways, residential and school properties, as well as a City-owned campground. Both segments are located in the Coastal Zone, within the Pacific Beach LCP.

Mission Bay Tributary – Mission Bay Drive is an earthen-bottom facility that occurs along Mission Bay Drive adjacent to the Mission Bay Golf Course, south of Grand Avenue. This facility has no recent history of maintenance. Flooding has the potential to affect public roadway, adjacent commercial properties which drain into this facility and a City-owned golf course. This facility is located in the Coastal Zone, within the Pacific Beach LCP.

Tecolote Creek – Chateau is a series of concrete-lined channels and ditches extending over one mile in total length through a residential neighborhood within Clairemont. The channels generally parallel Chateau Drive, running southeast from Diane Avenue toward Paola Way. The drainages include two forks perpendicular to the primary drainage extending northeast and parallel to Boxwood Drive and Paola Way. The facility discharges to Tecolote Creek. This facility has no recent

history of complete maintenance, although some minor maintenance was completed. Flooding has the potential to affect public roadways and residential and commercial properties.

Miramar – Engineer is a concrete-lined channel that begins south of Engineer Road and continues southeast toward Mercury Street, north of Dagget Street, through a commercial development. This facility does not have a history of recent maintenance. Flooding in this area has the potential to affect commercial properties. This facility is a ditch constructed within historic uplands and has been determined to be non-jurisdictional.

Tecolote Creek – Genesee is an earthen-bottom facility that extends north to south, is parallel to Genesee Avenue north of Marlesta Drive, and discharges to Tecolote Creek. This facility has no recent history of maintenance. Flooding has the potential to affect public roadways and residential and commercial properties.

Torrey Pines is an earthen-bottom facility located east of Torrey Pines Road and north of Straight Drive, within Pottery Canyon Park. Maintenance is proposed within limited portions of this facility to alleviate flood risk at specific structures (trash grate and culvert inlet). This facility has no recent history of maintenance. Flooding has the potential to affect public roadways, park open space, and adjacent residential properties. Pottery Canyon Park is listed on the City's Historical Resources Register (No. 108); any work within Pottery Canyon Park will require review by qualified historical resources staff.

5.3.2 BASIN FACILITIES

Alta La Jolla – Vickie is an earthen-bottom basin that is located west of Soledad Road, east of Westknoll Drive, and just north of the northern terminus of Vickie Drive. This detention basin was built in 2016 and mitigation was not required at the time of installation and is not expected to be required for future routine maintenance within the as-built basin footprint. Maintenance is proposed to alleviate flooding risk to downstream infrastructure and residential properties along Vickie Drive.

5.3.3 STRUCTURAL FACILITIES

No structural FMPs are proposed for this WMA.

5.4 SAN DIEGO RIVER

The San Diego River watershed (Table 15; Figure 3d, San Diego River Watershed) is in the central portion of the City and includes the communities of Mission Valley, Grantville, Del Cerro, San Carlos, and the College Area. It is bordered to the north by the Peñasquitos and San Dieguito River watersheds and to the south by the Pueblo San Diego and Sweetwater River watersheds and encompasses approximately 433 square miles. The major waterway in this area is the San Diego

River, with major tributaries and adjacent water bodies including Famosa Slough, Murphy Canyon, Norfolk Canyon, Alvarado Canyon, and Lake Murray Reservoir.

Table 15
FMP Summary – San Diego River Watershed

Number of Facility Group FMPs (Segments) Proposed	14 FMPs (~~29~~ 27 segments/structures)
Maintenance Area Previously Permitted	~~3.6~~2.2 acres
Maintenance Area Newly Proposed	7.2 acres

5.4.1 CHANNEL AND DITCH FACILITIES

Alvarado Canyon Creek – Alvarado is a drainage located south of I-8, starting perpendicular to Alvarado Road and bending northwest, ending near Brockbank Place. The drainage has a segment extending southeast from Reservoir Drive parallel to Alvarado Road. Segment 1 is an earthen-bottom channel and has a history of recent maintenance. Permanent impacts from prior maintenance have been mitigated. Segments 2 and 3 are a concrete-lined channel and ditch, respectively, that does not have a history of recent maintenance. Maintenance is proposed primarily to address potential ultimate vegetation conditions and/or concrete repair needs. Flooding in this area has the potential to affect commercial properties and adjacent roadways from curb inlets that cannot drain into the channel.

Alvarado Canyon Creek – Mission Gorge is a set of four concrete-lined channels located north of I-8, south of Mission Gorge Place, east of Fairmount Avenue, and west of Adobe Falls Road. This facility group occurs downstream from the Alvarado segments and discharges to the San Diego River. Flooding in this area has the potential to affect commercial properties and public roadways. Segments 1 and 2 have a history of recent maintenance. Permanent impacts from prior maintenance were mitigated. Segments 3 and 4 do not have a recent history of maintenance and are proposed for maintenance, primarily to address potential ultimate vegetation conditions and/or concrete repair needs.

Murphy Canyon Creek – **Murphy Canyon ~~and Stadium~~** are a set of drainages (~~four~~ two segments total) that represent a portion of ~~the~~ lower ~~portions of~~ Murphy Canyon Creek approximately one-half mile prior to discharge to the San Diego River. The Murphy Canyon Creek drainage is located west of I-15, parallel to Murphy Canyon Road, south of Stonecrest Boulevard, and north of ~~I-8~~Friars Road. ~~The stadium segments have a history of recent maintenance; associated permanent impacts were mitigated. Stadium 1 is an earthen-bottom channel and Stadium 2 is a concrete-lined channel.~~ The two Murphy Canyon segments do not have a history of recent maintenance. Murphy Canyon 1

is a concrete-lined channel and Murphy Canyon 2 is an earthen-bottom channel. An FMP~~s are~~ is proposed for ~~both stadium segments and~~ the concrete-lined Murphy Canyon segment. Flooding in ~~these areas~~this area has the potential to affect ~~City-owned stadium,~~a bike path~~,~~ and ~~a~~ private industrial property. No FMP is proposed for Murphy Canyon 2.

Murray Reservoir – Cowles Mountain includes two segments, a concrete-lined channel and concrete-lined ditch west of Boulder Lake Avenue and south and parallel to Beaver Lake Drive, continuing west of Cowles Mountain Boulevard. The facility runs southwest starting south of Navajo Road and ending north of San Carlos Drive. This facility has a recent history of emergency maintenance, although mitigation was only required for impacts to a brow ditch that are not a part of the proposed FMP. Flooding has the potential to affect public roadways, a school, and residential properties.

Norfolk Canyon Creek is a set of six segments: Fairmount Segments 1, 2, and 4, and Baja segment are concrete lined, and Fairmount Segment 3 and Aldine are earthen-bottom. Norfolk 2 and 4 are ditches, 54th Street is a channel and a ditch, and the other segments are channels. The Norfolk Canyon Creek drainage occurs on the western side of Fairmount Avenue, south of Montezuma Road to Van Dyke Place. The drainage has two segments, including one fork that extends southeast from Fairmount Avenue along Aldine Drive, and a second segment that runs west from Collwood Boulevard, south of Baja Drive, and north of Maisel Way. These segments do not have a history of recent maintenance. FMPs are proposed for all concrete-lined segments and a limited area within Fairmount Segment 3, where riprap is shown on the as-built drawing. Flooding in this area has the potential to affect commercial properties and public roadways.

San Diego River Tributaries – Camino del Rio and Camino del Arroyo are concrete-lined ditches that occur north of I-8 and discharge to the San Diego River. The Camino del Rio segment occurs parallel and south of Mission Center Road and drains into the Camino del Arroyo segment, which is parallel and east of Camino del Arroyo. This facility does not have a history of recent maintenance. Flooding in this area has the potential to affect commercial properties and roadways.

San Diego River Tributary – Nimitz is an earthen-bottom and concrete-lined drainage that runs southeast–east of Nimitz Boulevard and south of West Point Loma Boulevard. This facility includes three ditches that do not have a history of mechanized channel maintenance, but have been subject to selective vegetation trimming outside the facility by hand, as well as trash and debris removal. Flooding in this area has the potential to affect City parks and public roadways. An FMP is proposed for this group, including Segments 1 (earthen), 2 (concrete), and 3 (earthen).

San Diego River Tributary – Valeta is a concrete-lined ditch that extends north from the intersection of Famosa Boulevard and Valeta Street before discharging into a series of detention basins at the upper end of Famosa Slough. The facility segment does not have a history of recent maintenance. Flooding in this area has the potential to affect a City open space parking lot and trails,

adjacent residential property, public roadway, and native habitat. This facility is located in the Coastal Zone, within the Peninsula Community LCP.

5.4.2 BASIN FACILITIES

There are no basin facility FMPs proposed within the San Diego River WMA.

5.4.3 STRUCTURAL FACILITIES

1277 Camino del Rio South is an inlet structure (concrete-drop-type/culvert entrance) in the Mission Valley South drainage, which drains to the lower reach of an unnamed tributary to the San Diego River. The nearest intersection is Camino del Rio South and Mission Center Road; with access behind what is currently Chuze Fitness. Minor maintenance was conducted in 2017, and vegetation trimming occurred in 2016. There is vegetation/debris accumulation in front of the structure, and evidence of erosion on either side of the structure.

1331 Washington is an outlet structure in the Mission Valley South drainage that drains to the San Diego River via a concrete ditch. The nearest intersection is Washington Street and the SR-163 on ramp. Minor maintenance was conducted in 2017. There is vegetation and large debris (fallen palm trees) near the outlet structure and erosion is undermining the ditch.

1660 Hotel Circle North is an outlet structure (headwall) in the Mission Valley South drainage that drains to the San Diego River. The nearest intersection is Hotel Circle North and Fashion Valley Road. Minor maintenance was conducted in 2017 and 2016. Though currently clear, the outlet structure typically contains sediment/debris and deposition. The deposition is related to maintenance needs of the channel downstream within a private golf course property.

2087 Hotel Circle South is an inlet structure (headwall/culvert entrance) in the Mission Valley South drainage that drains to an unnamed tributary to the San Diego River. The nearest intersection is Hotel Circle South and the I-8 on ramp. Minor maintenance was conducted in 2017, and emergency maintenance was conducted in 2016. There is sediment/debris deposition in front of the inlet structure and three debris fences upstream.

901 Hotel Circle South is an inlet structure (headwall/culvert entrance) in the Mission Valley South drainage that drains to the San Diego River. The nearest intersection is Hotel Circle S and Bachman Road. Minor maintenance was conducted two times in 2017. There is sediment/debris deposition at the culvert entrance and debris fences, and concrete repair is needed.

5505 Friars Road is an outlet structure (headwall) in the Mission Valley North drainage that drains to the San Diego River. The nearest intersection is Friars Road and Colusa Street. Emergency

maintenance was conducted in 2016 and 2015. There is sediment/debris deposition and vegetation growth at the outlet structure.

5.5 SAN DIEGO BAY

The San Diego Bay WMA includes three watersheds: Pueblo San Diego, Otay, and Sweetwater. Each is discussed separately below.

5.5.1 PUEBLO SAN DIEGO

The Pueblo San Diego watershed (Table 16; Figure 3e, Pueblo San Diego Watershed) is located south of I-8, west of SR-125, and north of SR-54, and drains into San Diego Bay. The Pueblo San Diego watershed encompasses an area of approximately 60 square miles. Communities within the Pueblo watershed include downtown San Diego, City Heights, Mid-City, Balboa Park, North Park, Barrio Logan, Logan Heights, Valencia Park, and Encanto. Chollas Creek is the major drainage within the watershed and includes branches named Auburn Creek, South Chollas Creek, and Encanto Branch. The City has recently completed a Watershed Master Plan for the Chollas Creek subwatershed. Paleta Creek occurs south of Chollas Creek. North of Chollas Creek, facilities included in the MWMP occur at Mission Hills Canyon, Washington Canyon, and Powerhouse Canyon.

Table 16
FMP Summary – Pueblo San Diego Watershed

Number of Facility Group FMPs (Segments) Proposed	24 FMPs (38 segments/basins/structures)
Maintenance Area Previously Permitted	8.3 acres
Maintenance Area Newly Proposed	9.5 acres

5.5.1.1 Channel and Ditch Facilities

Auburn Creek – Home and Wightman are a set of channels that flow from University Avenue around 52nd Street through the communities of City Heights to Chollas Creek at Home Avenue and Federal Boulevard. All the channel segments are earthen-bottom, although some areas have riprap or concrete-lined banks. Flooding throughout this creek has the potential to affect residential and commercial properties and public roadways. Maintenance is proposed within Wightman (Segments 1 and 2), and Home (Segment 1, a portion of Segment 2, Segment 3, and Segment 5). No FMP is proposed for Home (Segment 4).

Chollas Creek Tributary – 54th St and Megan are a mix of concrete-lined and earthen-bottom segments. The 54th Street segment is a concrete-lined channel, per an as-built drawing, and occurs

northeast of the intersection of 54th Street and College Grove Drive. The Megan segments are ditches that occur west of Euclid Avenue and south of Megan Way; Megan 1 is concrete lined, and Megan 2 is earthen-bottom. None of the segments have a recent history of maintenance. FMPs are proposed within all three segments.

Chollas Creek Tributary – Martin is an earthen-bottom channel segment located south of the intersection of 35th Street and Martin Avenue. The segment does not have a history of maintenance; an FMP is proposed to address scour within a portion of the channel bed.

Chollas Creek Tributary – J St is an earthen-bottom ditch segment located south of Market Street, west of Denby Street, and north of J Street. The segment does not have a history of maintenance; an FMP is proposed to address vegetation overgrowth and sediment accumulation.

Chollas Creek Tributary – Castana is an earthen-bottom ditch segment located south of Groveland Drive, east of Euclid Avenue, and north of Castana Street. There is no recent maintenance history for the ditch. An FMP is proposed to address potential concrete repairs needed at the upstream end of the segment.

Chollas Creek – National, Cartagena, and Rolando are segments of Chollas Creek. The National segments are in the lower watershed and occur west and parallel to I-15 beginning at Steel Street and continue south, ending at I-5. National segment 1 is an earthen-bottom channel, while the segment 2 is a concrete-lined channel. The Cartagena and Rolando segments are ditches in the upper watershed and located south of University Avenue, west and east of Bonillo Drive. East of Rolando Boulevard, the segment is earthen-bottom; west of Rolando Boulevard the segments are concrete lined. Flooding throughout this creek has the potential to affect residential and commercial properties and public roadways. A portion of National segment 1, all of National segment 2, and Rolando segment 2 were recently maintained, and mitigation is proposed for permanent impacts associated with recent maintenance. Minor maintenance was conducted in 2016 to remove a section of concrete wall that had fallen into the Cartagena segment. FMPs are proposed for these facilities within the area of previous maintenance for earthen-bottom segments (National segment 1 and Rolando segment 2) and all of the concrete-lined segments (National segment 2, Cartagena and Rolando segment 1).

Mission Hills Canyon Creek and Washington Canyon Creek drainages are located in the Mid-Town community. Mission Hills Canyon Creek is located northeast of Titus Street, northwest of Pringle Street, and southeast of Henry Street. The Washington Canyon Creek drainage is parallel north and east of West Washington Street from Ibis Court to Columbia Street. The Mission Hills Canyon Creek segment is an earthen-bottom channel; the downstream segment of Washington Canyon Creek is an earthen-bottom channel, but most of the facility is a concrete-lined ditch. Both facilities were recently maintained; Mission Hills Canyon Creek did not require mitigation, but

mitigation is proposed for Washington Canyon Creek. Flooding of these facilities has the potential to affect commercial and residential properties, as well as public roadways.

Paleta Creek – Cottonwood and Solola are primarily concrete-lined drainages, except in the upper portion of the Solola group. Cottonwood is downstream and located north of East Division Street and extends east from Osborn Street toward South 43rd Street. The Solola segments begin at South 47th Street and run east toward Bonita Drive, then extend northeast along Cervantes Avenue, and end near South Radio Drive. Solola 1 is a concrete ditch, Solola 2 is a concrete channel, and Cervantes is an earthen-bottom channel. Flooding throughout this creek has the potential to affect residential and commercial properties and public roadways. The Cottonwood channel was recently maintained, and mitigation is proposed for permanent impacts associated with recent maintenance. The Solola segment was subject to concrete repair and minor maintenance for trimming of overhanging vegetation; no mitigation was required. FMPs are proposed for Cottonwood and the concrete-lined segment of Solola.

Powerhouse Canyon Creek are concrete-lined channels located southeast of I-5 and parallel to Pershing Drive. The channel does not have a history of recent maintenance. Flooding in this area has the potential to affect a City maintenance yard and public roadway.

San Diego Bay– 28th Street is a small segment of earthen-bottom channel south of SR-94 and west of 28th Street. Flooding throughout this creek has the potential to affect residential properties and public roadways. A portion of the eastern bank currently has erosion damage and is proposed for slope re-stabilization to its as-built/current existing condition. No recent maintenance has been conducted at this channel.

South Chollas Creek – Southcrest, Euclid, and Federal are primarily earthen-bottom channels that occur south of SR-94 and run through southeastern San Diego. The Southcrest segments (Alpha and Ocean View) begin north of Ocean View Boulevard, continue south and southwest at Boston Avenue, and end north of Alpha Street. The Euclid segment begins north of Market Street west of Euclid Avenue, extends north and bends east, crosses Euclid Avenue, and continues north parallel to 51st Street. The Federal segment occurs north of Federal Boulevard and ends near Winnett Street. These facilities do not have a recent history of channel maintenance. Flooding throughout this creek has the potential to affect residential and commercial properties, as well as public roadways and City parks. FMPs are proposed for a limited portion of the Alpha and Ocean View segments and the concrete-lined segments at Federal and Euclid.

South Chollas Creek Encanto Branch – Imperial and Jamacha are segments of a branch of South Chollas Creek that extends from around Euclid Avenue east into the communities of Encanto and along Imperial Avenue and Jamacha Boulevard. Imperial is a concrete-lined channel north of Imperial Avenue, south of Market Street, east of 54th Street, and west of Iona Drive. The Jamacha channel begins east of

Imperial Avenue and runs east, south of Jamacha Road, then bends northeast and ends near Car Street. The facility has two segments: one south of Lisbon Street and west of Porter Street, and the other east of Lausanne Drive and south of Cadman Street. Except for a small portion of the Jamacha segment, these facilities do not have a recent history of maintenance. A CIP project is planned for Jamacha Canyon to provide increased flood conveyance capacity, stream restoration, and green infrastructure. Flooding of these facilities has the potential to affect residential and commercial properties, public roadways, railways, and public parks and open space. FMPs are proposed for a limited portion of the Jamacha segments and the concrete-lined segment of Imperial (Imperial 2).

5.5.1.2 Basin Facilities

Maple Canyon Creek – Maple is an earthen-bottom basin that is located west of Albatross Street, west of West Maple Street, and at the south end of Curlew Street. This desilting basin was constructed in 2008 and requires regular maintenance to clear the high levels of sedimentation that are deposited from upstream in Maple Canyon Creek. There is a high level of sediment in the basin currently that needs to be removed to alleviate the flood risk to infrastructure and residential properties downstream along West Maple Street. A multi-phase CIP is being planned for the Maple Canyon Creek watershed.

5.5.1.3 Structural Facilities

1206 Goodyear is an outlet structure in the South Chollas drainage that drains to the lower reach of South Chollas Creek. The nearest intersection is Boston Avenue and Goodyear Street. Minor maintenance was conducted in 2016 and 2015. The current condition of this facility is unknown.

3644 Roselawn is an outlet structure (pipe and headwall) in the Chollas drainage that drains to Auburn Creek. The nearest intersection is Roselawn Avenue and Euclid Avenue. Minor maintenance was conducted in 2016. Though currently clear, the outlet structure typically contains sediment/debris deposition and vegetation growth.

4202 J Street is an outlet structure (pipe and headwall) in the Chollas drainage that drains to an unnamed tributary of Chollas Creek. The nearest intersection is J Street and 42nd Street. There is no known maintenance history for this facility. There is sediment/debris deposition and vegetation growth at the outlet structure.

5.5.2 SWEETWATER

The Sweetwater watershed (Table 17; Figure 3f, Sweetwater Watershed) is primarily located outside the City but includes a portion of southeastern San Diego. The Sweetwater watershed encompasses approximately 230 square miles of open undeveloped and urban land uses. Only one facility in the MWMP is included in this watershed: a tributary to the Sweetwater River.

Table 17
FMP Summary – Sweetwater Watershed

Number of Facility Group FMPs (Segments) Proposed	1 FMP (1 segment)
Maintenance Area Previously Permitted	1.0 acre
Maintenance Area Newly Proposed	0.0 acres

5.5.2.1 Channel and Ditch Facilities

Sweetwater River Tributary – Parkside is a concrete-lined channel located south and parallel to Parkside Avenue and north of Garber Avenue. The channel was recently maintained, and mitigation is proposed for permanent impacts associated with maintenance. Flooding has the potential to affect residential properties and a public roadway.

5.5.2.2 Basin Facilities

There are no basin facility FMPs proposed within the Sweetwater watershed.

5.5.2.3 Structural Facilities

There are no structural facility FMPs proposed within the Sweetwater watershed.

5.5.3 OTAY

The Otay watershed (Table 18; Figure 3g, Otay Watershed) is located south of SR-54 and west of Lower Otay Lake in the community of Nestor. The Otay watershed encompasses approximately 150 square miles and includes four major waterbodies: the Upper and Lower Otay Reservoirs, Otay River, and San Diego Bay. Two facilities are in this watershed: Nestor Creek (which comprises five segments), and a tributary to Nestor Creek.

Table 18
FMP Summary – Otay Watershed

Number of Facility Group FMPs (Segments) Proposed	2 FMPs (8 segments)
Maintenance Area Previously Permitted	0.4 acre
Maintenance Area Newly Proposed	4.2 acres

5.5.3.1 Channel and Ditch Facilities

Nestor Creek – 30th, Cedar, Dahlia, Cerrissa, and Grove are channels that outlet to the southern end of San Diego Bay, west of I-5 and north of Palm Avenue. The drainage continues southeast parallel to Cerrissa Street toward Coronado Avenue, and then east of I-5 along Grove Avenue, and ends at 30th Street. Recent minor maintenance was conducted within the downstream concrete-lined segments. Flooding has the potential to affect residential and commercial properties and public roadways. FMPs are proposed for all segments of Nestor. The Cedar portion of Nestor Creek is located in the Coastal Zone, within the Otay Mesa-Nestor LCP.

Nestor Creek Tributary – Outer includes a concrete-lined ditch and an earthen-bottom ditch that occur east of I-5, north of Coronado Avenue, and south of Outer Road. The facility has no recent history of maintenance. Flooding has the potential to affect commercial properties and a public roadway.

5.5.3.2 Basin Facilities

There are no basin facility FMPs proposed within the Otay watershed.

5.5.3.3 Structural Facilities

There are no structural facility FMPs proposed within the Otay watershed.

5.6 TIJUANA RIVER

The Tijuana River watershed (Table 19; Figures 3h.1 and 3h.2, Tijuana River Watershed) is located in the Otay Mesa, San Ysidro, and Tijuana River Valley communities of the City. The Tijuana River WMA encompasses a region of approximately 1,750 square miles. The Otay Mesa area drains south into Mexico; the San Ysidro area supports several drainages that are tributary to the Tijuana River through drainage in the United States; the Tijuana River Valley includes the Tijuana River itself, as well as tributary drainages at Smuggler's Gulch and Tocayo.

Table 19
FMP Summary – Tijuana River Watershed

Number of Facility Group FMPs (Segments) Proposed	6 FMPs (12 segments/basins)
Maintenance Area Previously Permitted	7.7 acres
Maintenance Area Newly Proposed	3.7 acres

5.6.1 CHANNEL AND DITCH FACILITIES

Tijuana River Pilot Channel and Smuggler's Gulch are channels that extend northwest from Hollister Street and are located south of Sunset Avenue and north of Monument Road. The portion of the Tijuana River currently subject to City maintenance is known as the Pilot Channel (or Southern Channel). These facilities have a history of recent channel maintenance; mitigation was completed for the construction of the Pilot Channel, and mitigation is ongoing to support maintenance of both the Pilot Channel and Smuggler's Gulch. Flooding in this area has the potential to affect commercial and park properties, as well as public roadways. Both facilities are located in the Coastal Zone, within the Tijuana River Valley LCP.

Tijuana River Tributary – La Media is an earthen-bottom ditch located east of and parallel to La Media Road, crosses SR-905, and ends south of Saint Andrews Avenue. This facility does not have a history of recent maintenance. A CIP project is planned to improve La Media Road and Airway Road. The property east of La Media Road and north of Airway Road includes a conservation easement. Flooding of this facility has the potential to affect commercial properties and public roadways. An FMP is proposed to provide limited maintenance immediately upstream of the Airway Road culvert.

Tijuana River Tributary – Via Encantadoras, Smythe, and Via de la Bandola drainage occurs in four segments south of SR-905. The first, upstream segment extends east, north of Via de la Bandola and east of Smythe Avenue. The second segment is perpendicular to and west of Smythe Avenue, north of Shooting Star Drive, and east of Del Sur Boulevard. The final three segments are south of Beyer Boulevard and east of Via Encantadoras, with the downstream segment occurring between West San Ysidro Boulevard and I-5. Flooding of this facility has the potential to affect residential and commercial properties and public roadways. The Via de la Bandola ditch and Smythe channels were recently maintained, and mitigation has been proposed to mitigate permanent impacts associated with maintenance. The Via Encantadoras channels do not have a history of recent maintenance. FMPs are proposed for all segments.

Tijuana River Tributary – Tocayo drainage is located south and parallel to Tocayo Avenue, west of Oro Vista Road, and east of Rodear Road. The drainage is primarily concrete-lined channels except for the small downstream earthen-bottom segment, west of Rodear Road. Flooding of this facility has the potential to affect residential properties and a public roadway. This facility does not have a history of recent complete channel maintenance, although some minor maintenance (vegetation trimming) has occurred. An FMP is proposed for the concrete-lined portions of the facility. This facility is located in the Coastal Zone, within the Tijuana River Valley LCP.

5.6.2 BASIN FACILITIES

Spring Canyon Creek Tributary – **Cactus** is made up of two concrete-lined detention basins located north of SR-905, south of Camino Maquiladora, and east of Pacific Rim Court. This facility

does not have a history of recent maintenance. Flooding of this facility has the potential to affect commercial properties and public roadways.

Tijuana River Tributary – Siempre Viva is an earthen-bottom, linear detention basin located south of Siempre Viva Road. The drainage has two segments: one extending west of Britannia Boulevard and north of Bristow Court, and the other extending east of Britannia Court. The drainages are designed to detain and infiltrate storm flows. This facility was recently maintained and determined to be a non-jurisdictional, isolated basin. Flooding of this facility has the potential to affect commercial properties and public roadways.

5.6.3 STRUCTURAL FACILITIES

There are no structural facility FMPs proposed within the Tijuana watershed.

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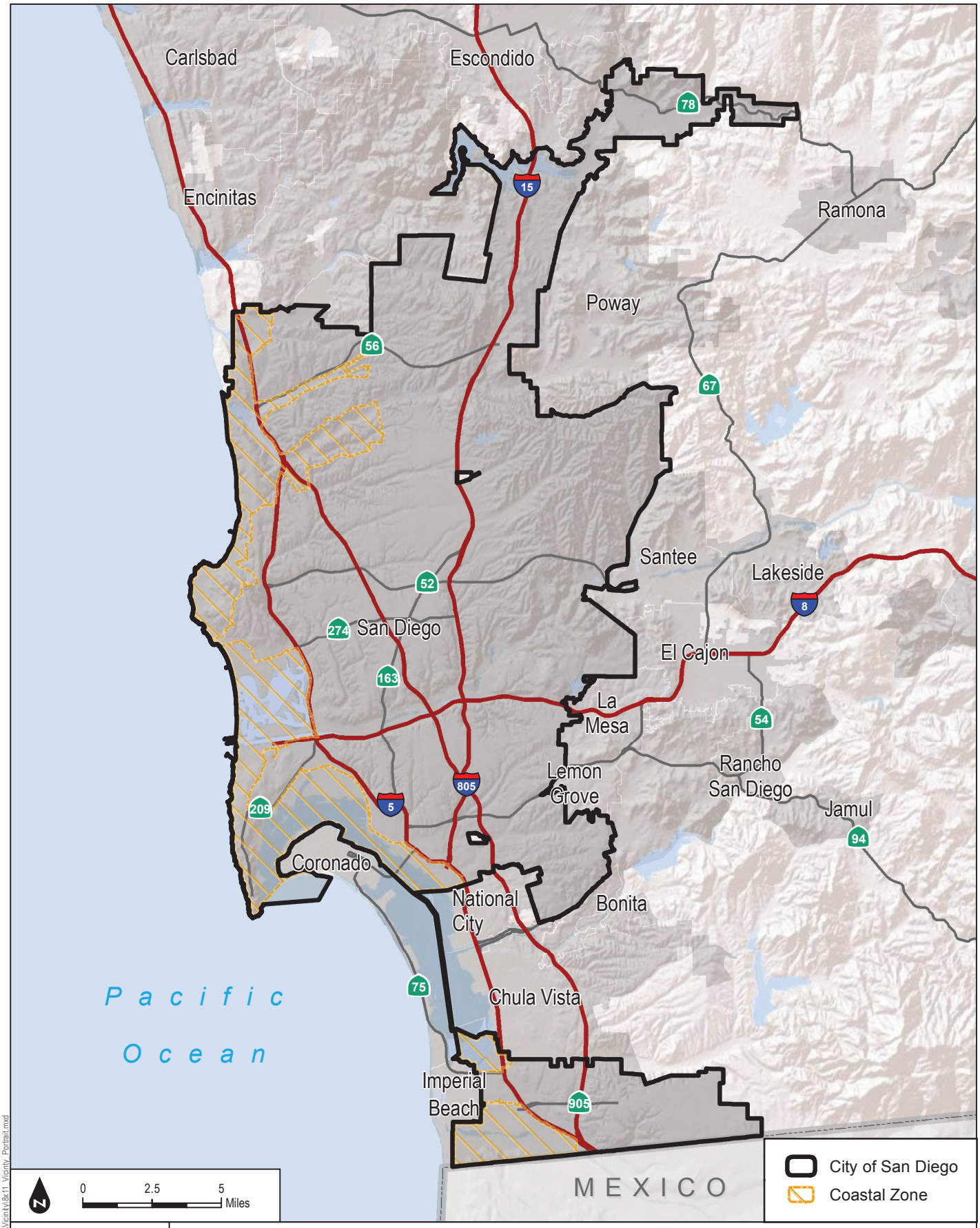

DUDEK

The City of SAN DIEGO

Municipal Waterways Maintenance Plan

Figure 1 - Regional Map

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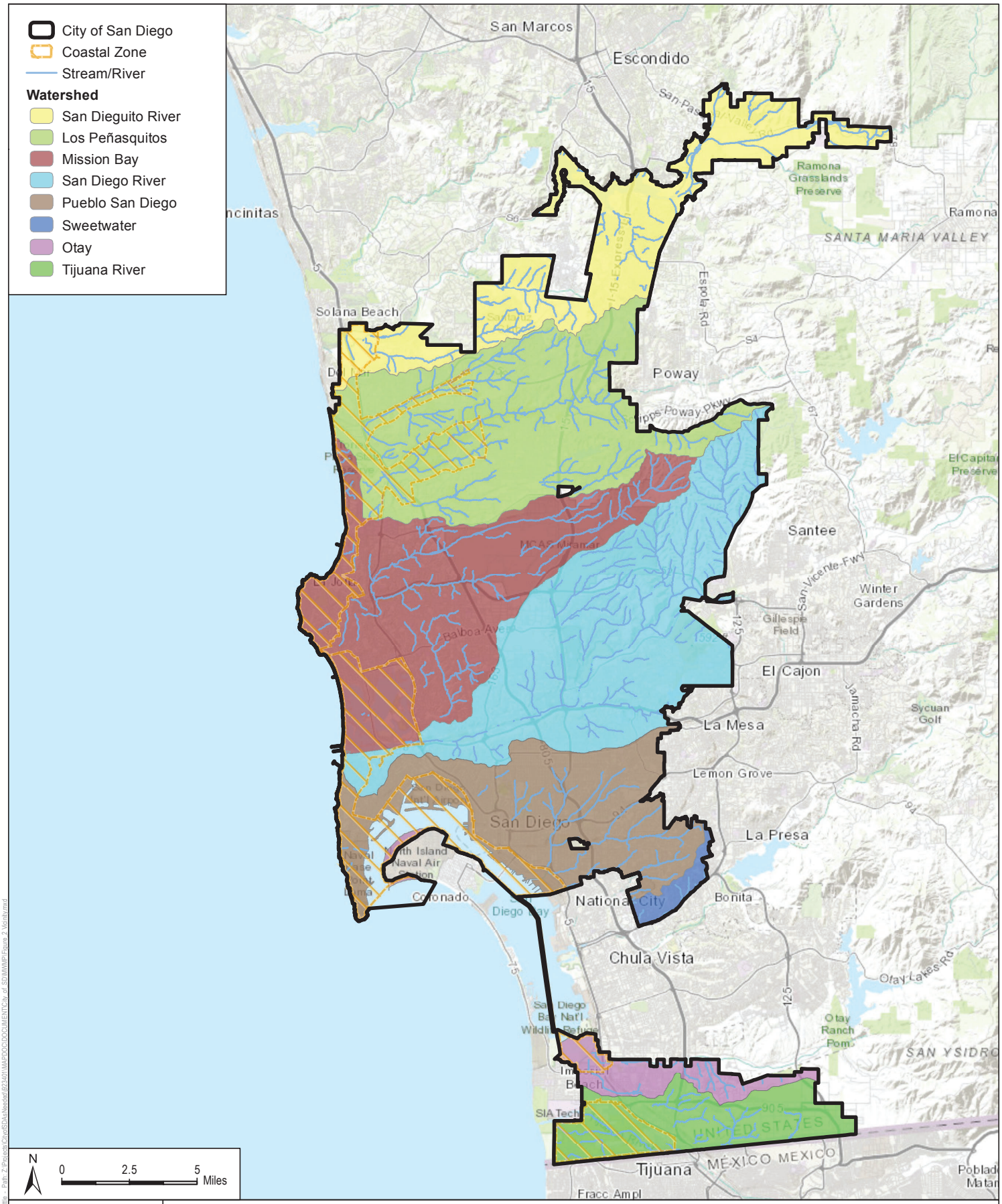

DUDEK

The City of SAN DIEGO

Municipal Waterways Maintenance Plan

SOURCE: ESRI, 2017

Figure 2 - Vicinity Map

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City of San Diego
Open Space/Parks
Multi-Habitat Planning Area
Coastal Zone

Municipal Waterways Maintenance Plan

Proposed MWMP Project Facilities (FMPs)
Additional Facilities (MWMP Limited Program-Level Activities)
Removed

3-5a
3-5b
3-5c
3-5d
3-5e
3-5f
3-5g
3-5h.1
3-5h.2

Watersheds

San Dieguito River
Los Peñasquitos
Mission Bay
San Diego River
Pueblo San Diego
Sweetwater
Otay
Tijuana River

N
0 2.5 5 Miles

DUDEK

The City of SAN DIEGO

SOURCE: ESRI, 2017; SANDAG, 2017; USGS, 2012

Municipal Waterways Maintenance Plan

Figure 3 - City-Wide Overview/Index Map

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City of San Diego
Stream/River
Open Space/Parks
Multi-Habitat Planning Area
Coastal Zone

Municipal Waterways Maintenance Plan

Project Facility Maintenance Plans (FMPs)
Additional Facilities (Limited Program-Level Activities)

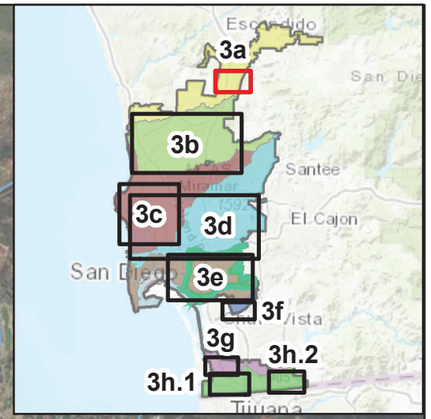
Watershed

San Dieguito River
Los Peñasquitos

Green Valley Creek - Paseo del Verano

Green Valley Creek - Pomerado

15



N
0 0.25 0.5 Miles

DUDEK

The City of SAN DIEGO

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Municipal Waterways Maintenance Plan

Figure 3a - San Dieguito River Watershed

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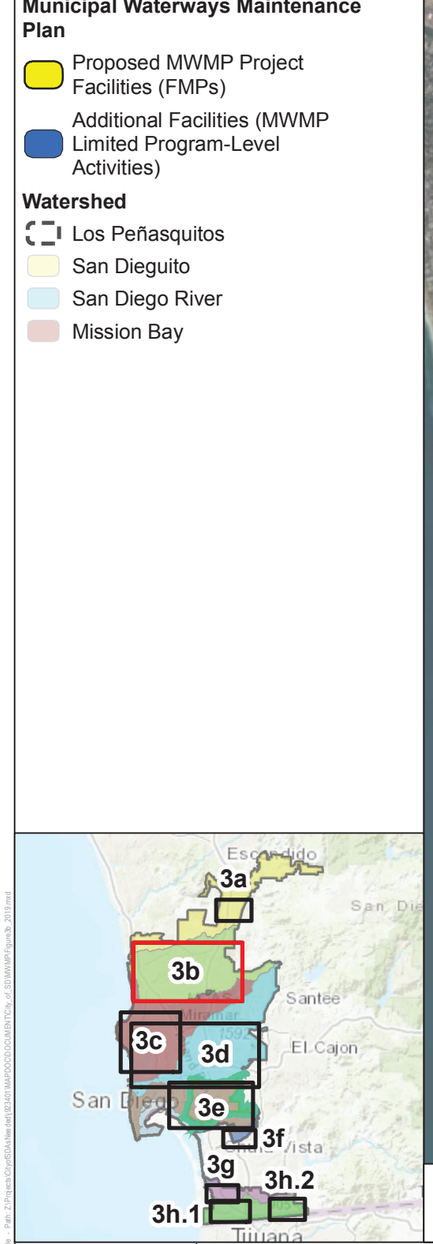
City of San Diego
Stream/River
Open Space/Parks
Multi-Habitat Planning Area
Coastal Zone

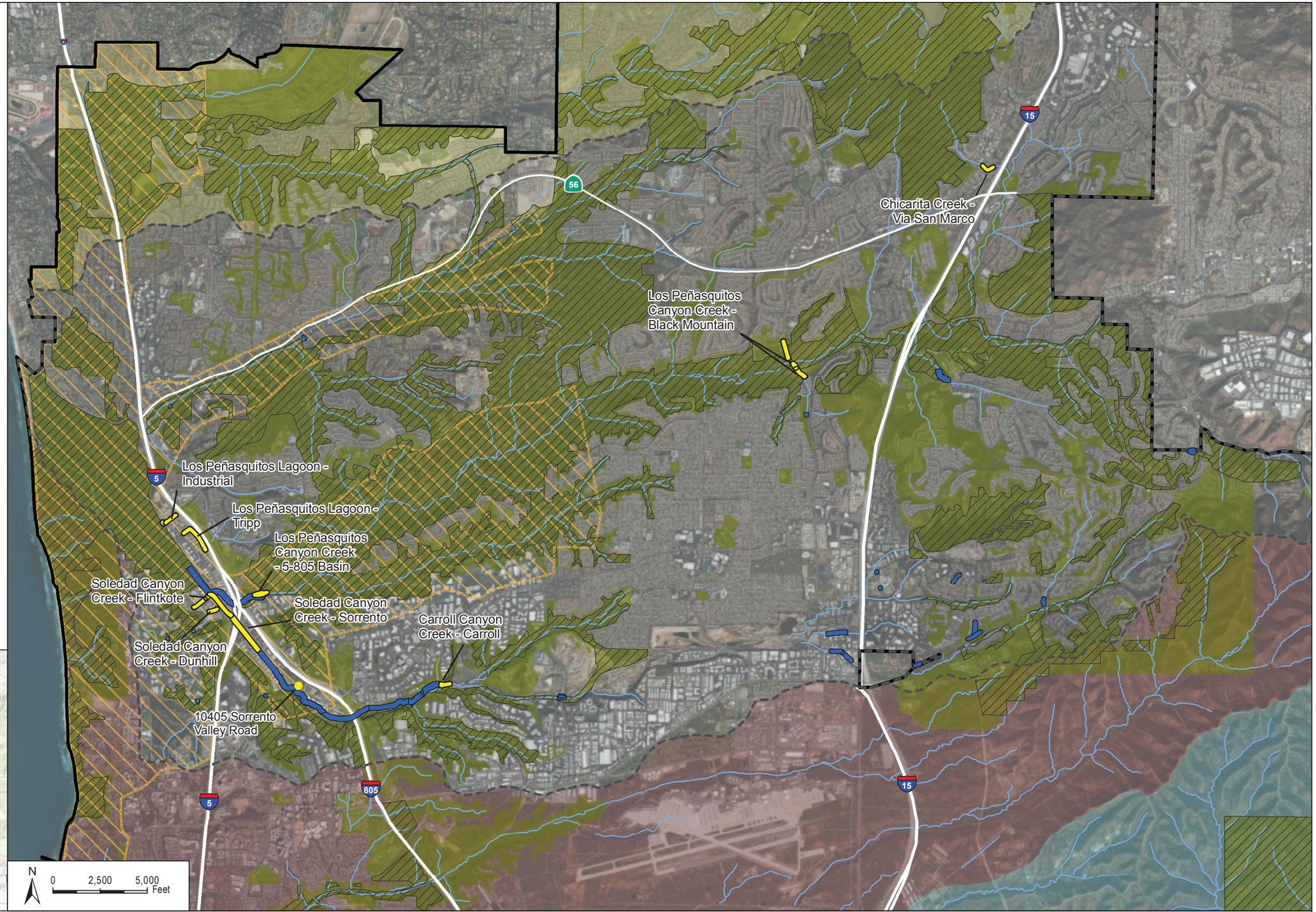
Municipal Waterways Maintenance Plan

Proposed MWMP Project Facilities (FMPs)
Additional Facilities (MWMP Limited Program-Level Activities)

Watershed

Los Peñasquitos
San Dieguito
San Diego River
Mission Bay





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The City of SAN DIEGO

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Municipal Waterways Maintenance Plan

Figure 3b - Los Peñasquitos Watershed

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City of San Diego

Stream/River

Open Space/Parks

Multi-Habitat Planning Area

Coastal Zone

Municipal Waterways Maintenance Plan

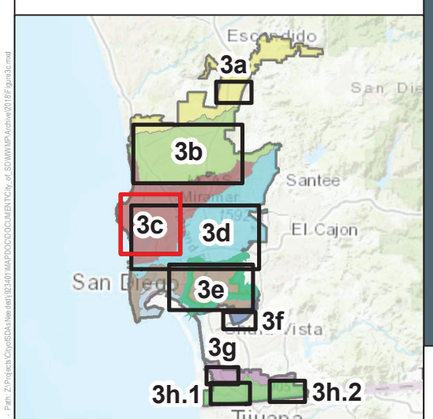
Proposed MWMP Project Facilities (FMPs)

Additional Facilities (MWMP Limited Program-Level Activities)

Watershed

Mission Bay

San Diego River



DUDEK

The City of SAN DIEGO

Municipal Waterways Maintenance Plan

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Figure 3c - Mission Bay Watershed

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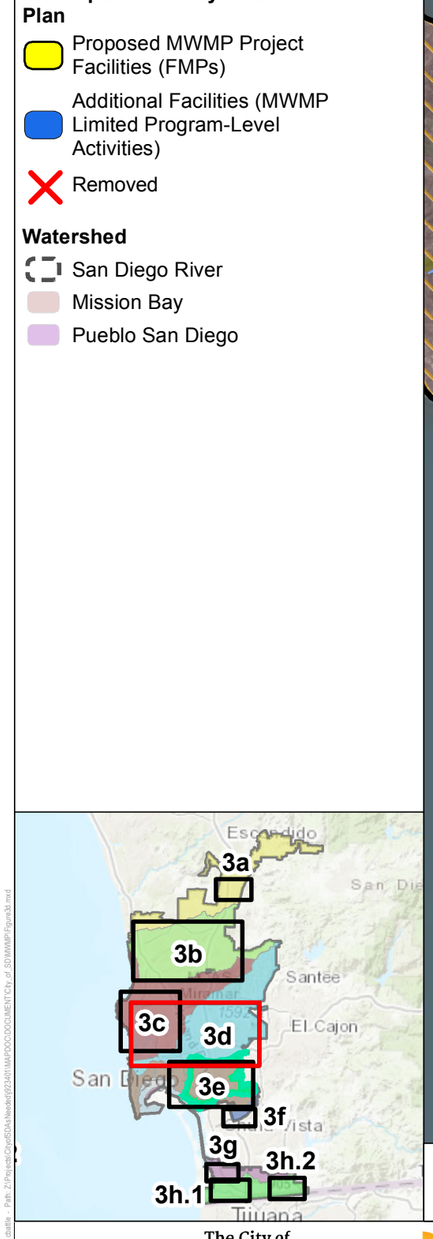
City of San Diego
Stream/River
Open Space/Parks
Multi-Habitat Planning Area
Coastal Zone

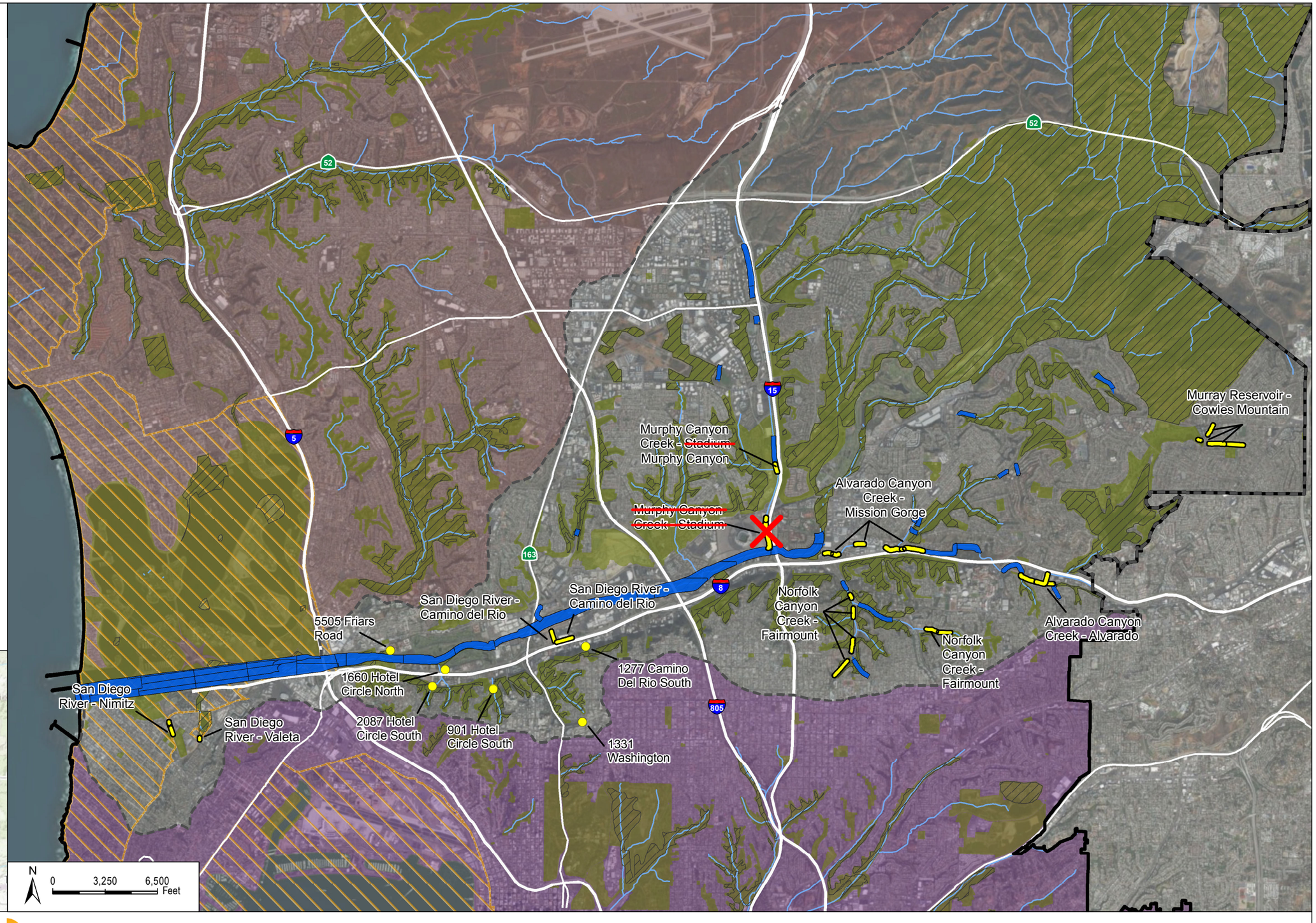
Municipal Waterways Maintenance Plan

Proposed MWMP Project Facilities (FMPs)
Additional Facilities (MWMP Limited Program-Level Activities)
Removed

Watershed

San Diego River
Mission Bay
Pueblo San Diego





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The City of SAN DIEGO

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Municipal Waterways Maintenance Plan

Figure 3d - San Diego River Watershed

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City of San Diego
Stream/River
Open Space/Parks
Multi-Habitat Planning Area
Coastal Zone

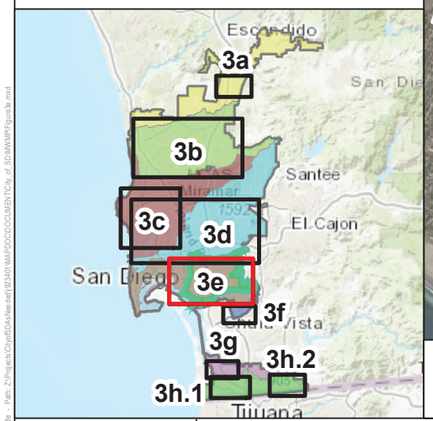
Municipal Waterways Maintenance Plan

Proposed MWMP Project Facilities (FMPs)
Additional Facilities (MWMP Limited Program-Level Activities)

Watershed

Pueblo San Diego Watershed
Chollas Creek Watershed Master Plan Area
Sweetwater
San Diego River

Mission Hills Canyon Creek - Titus
Washington Canyon Creek - Washington
Maple Canyon Creek - Maple
Powerhouse Canyon Creek - Pershing
San Diego Bay - 26th St
Chollas Creek - National & Oceanview
1206 Goodyear
Paleta Creek - Cottonwood
Auburn Creek - Wightman
3644 Roselawn
Auburn Creek - Home
Chollas Creek - Megan
Chollas Creek - 54th St
Chollas Creek - Rolando
4202 J Street
Chollas Creek - J St
South Chollas Creek - Southcrest
South Chollas Creek - Euclid
South Chollas Creek - Federal
South Chollas Creek Encanto Branch - Imperial
South Chollas Creek Encanto Branch - Castana
South Chollas Creek Encanto Branch - Jamacha
Paleta Creek - Solola



N
0 1,900 3,800 Feet

DUDEK

The City of SAN DIEGO

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Municipal Waterways Maintenance Plan

Figure 3e - Pueblo San Diego Watershed

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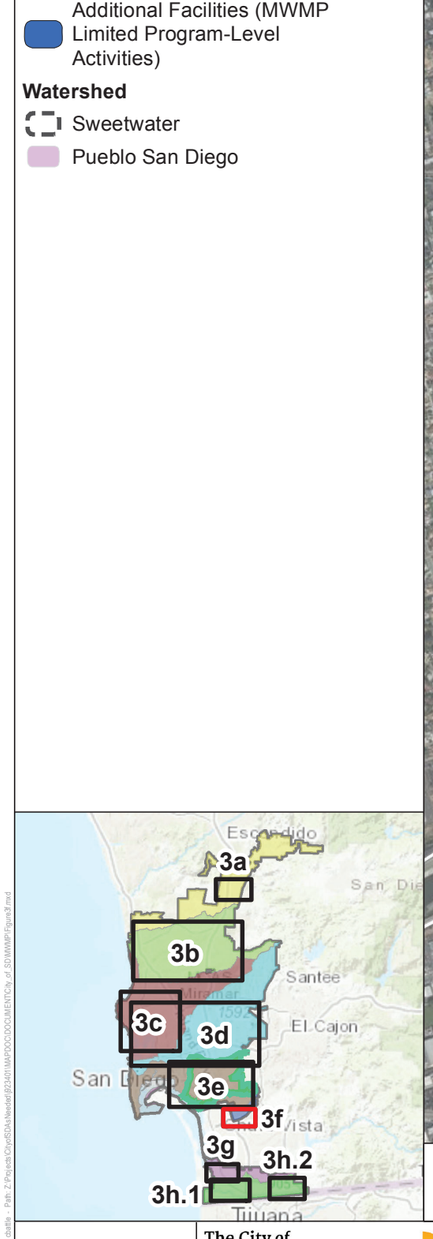
City of San Diego
Stream/River
Open Space/Parks
Multi-Habitat Planning Area
Proposed MWMP Project Facilities (FMPs)
Additional Facilities (MWMP Limited Program-Level Activities)

Watershed

Sweetwater
Pueblo San Diego



Sweetwater River - Parkside

805
54

N
0 800 1,600 Feet

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The City of SAN DIEGO

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Municipal Waterways Maintenance Plan

Figure 3f - Sweetwater Watershed

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City of San Diego

Stream/River

Open Space/Parks

Multi-Habitat Planning Area

Coastal Zone

Municipal Waterways Maintenance Plan

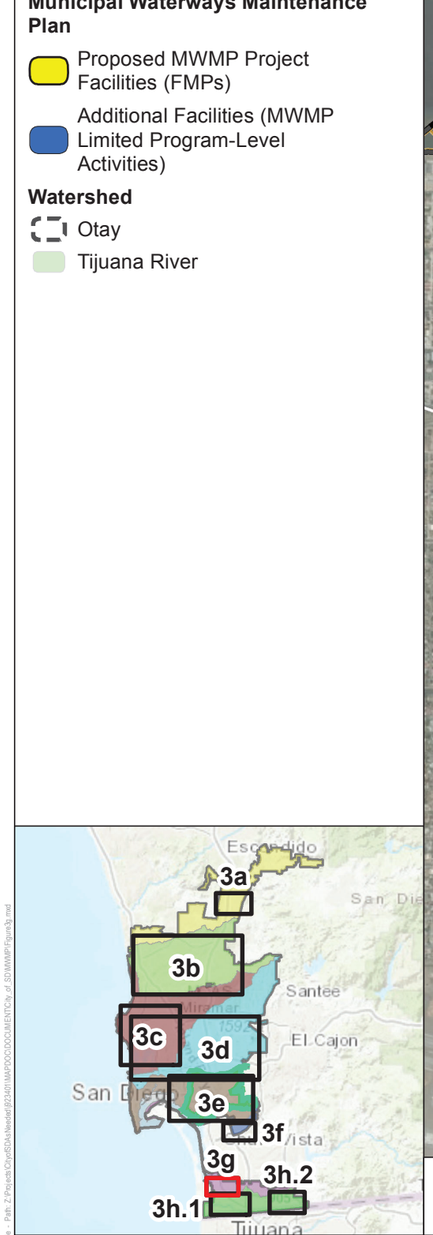
Proposed MWMP Project Facilities (FMPs)

Additional Facilities (MWMP Limited Program-Level Activities)

Watershed

Otay

Tijuana River



DUDEK

The City of SAN DIEGO

Municipal Waterways Maintenance Plan

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Figure 3g - Otay Watershed

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City of San Diego

Stream/River

Open Space/Parks

Multi-Habitat Planning Area

Coastal Zone

Municipal Waterways Maintenance Plan

Proposed MWMP Project Facilities (FMPs)

Additional Facilities (MWMP Limited Program-Level Activities)

Watershed

Tijuana River

Otay

Tijuana River - Tocayo

Tijuana River - Smythe

Tijuana River - Smythe

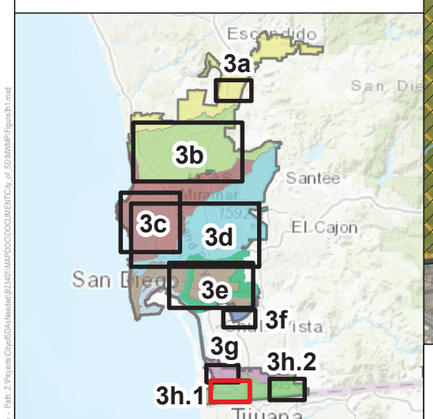
Tijuana River - Pilot & Smuggler's

Tijuana River - Pilot & Smuggler's

905

5

805



N

0 1,000 2,000 Feet

DUDEK

The City of SAN DIEGO

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Municipal Waterways Maintenance Plan

Figure 3h.1 - Tijuana River Watershed

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City of San Diego

Stream/River

Open Space/Parks

Multi-Habitat Planning Area

Municipal Waterways Maintenance Plan

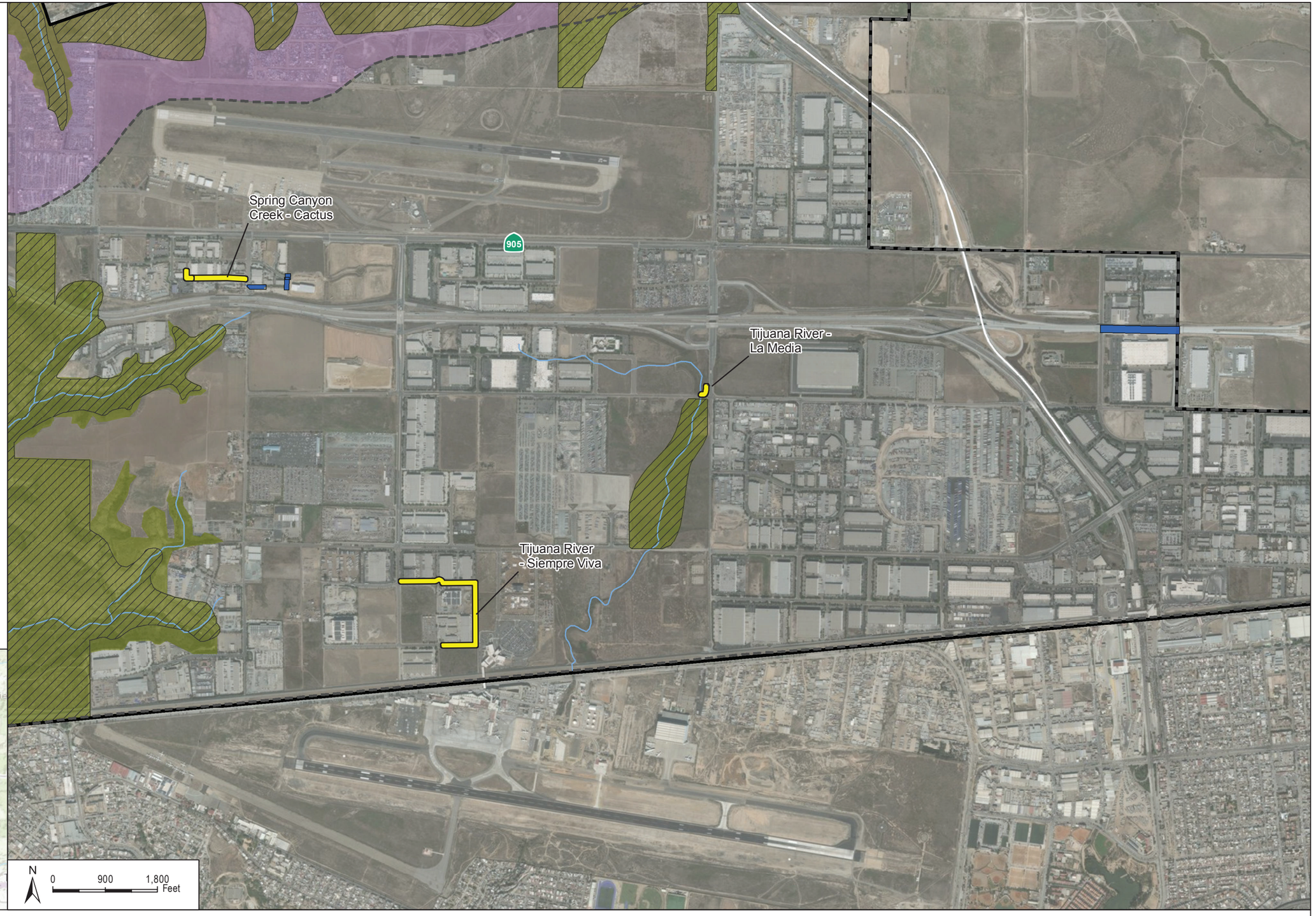
Proposed MWMP Project Facilities (FMPs)

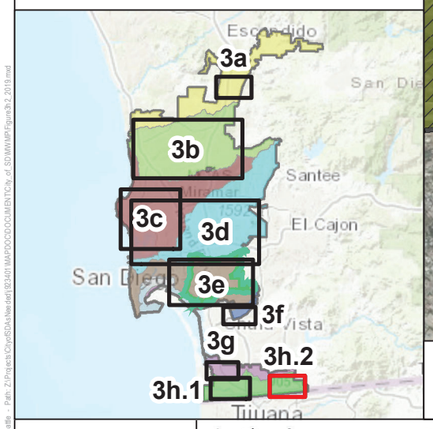
Additional Facilities (MWMP Limited Program-Level Activities)

Watershed

Tijuana River

Otay





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The City of SAN DIEGO

Municipal Waterways Maintenance Plan

SOURCE: ESRI, 2016; SANDAG, 2016; USGS, 2012

Figure 3h.2 - Tijuana River Watershed

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