APPENDIX A

Facility Maintenance Plans, Maintenance Methods, and Technical Summaries

APPENDIX A
Facility Maintenance Plans, Maintenance Methods, and Technical Summaries

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EXECUTIVE SUMMARY

This appendix to the City of San Diego (City) *Municipal Waterways Maintenance Plan* (MWMP) provides a summary of the evaluations conducted to develop the identified list of proposed project-level activities (Facility Maintenance Plans [FMPs]) and program-level activities. There are six appendices to this document, as follows:

- Channels/ditches (Appendix A-1)
- Basins (Appendix A-2)
- Structural facilities (Appendix A-3)
- Maintenance methods for additional facility repairs and protection measures (Appendix A-4)
- Facilities that were evaluated but do not have FMPs (Appendix A-5)
- Facilities that were not evaluated but are annually inspected (Appendix A-6)

The FMPs (including technical summary and maintenance methods) in Appendices A-1, A-2, and A-3, and the additional maintenance methods in A-4, will allow environmental planning, engineering, regulatory agencies, and maintenance field staff and supervisors to understand the conditions of each facility, the activities and work limits allowed under the MWMP, and required protection and mitigation measures. Also included in this appendix are methods and references used to develop the FMPs.

Appendices A-5 and A-6 include a set of facilities that the City likely has the responsibility to maintain based on available GIS data. The facilities in Appendix A-5 underwent an evaluation of hydrologic and hydraulic conditions and do not require maintenance at this time. This facility information is included to support potential programmatic maintenance activities at these locations, although no FMP has been prepared or included.

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1 INTRODUCTION

Dudek contracted with the City of San Diego (City) Transportation & Storm Water Department (TSW), Operations & Maintenance (O&M) Section to evaluate drainage facilities throughout the City and potential options to obtain environmental approvals to conduct O&M activities at these facilities. Although TSW's current environmental program focuses on O&M activities at approximately 32 miles of channels within the City under the Master Storm Water System Maintenance Program (MMP) (adopted in 2013), as part of development of the *Municipal Waterways Maintenance Plan* (MWMP) replacement of the MMP, Dudek and TSW considered evaluation of the following:

- Approximately 50 miles of channels (from previous/current MMP-related efforts)
- 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 Capital Improvement Project (CIP) facilities (outlets, BMPs, and stream restoration)

As part of development of the 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 will identify potential impacts that could result from maintenance and repair activities for all storm water facilities City-wide, but will require subsequent review for certain activities where the significance of an impact, as disclosed in the Environmental Impact Report prepared for the MWMP, is not analyzed at the project or site-specific level. The programmatic or plan-wide analysis will help to address the goal of providing a comprehensive review of potential TSW O&M 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 will support this goal. Therefore, the 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 ensure infrastructure longevity. This Appendix A is a compilation of FMPs, maintenance methods, and technical summaries that resulted from that analysis.

Section 2 provides a description of how facilities were selected to be evaluated to determine if a FMP would be proposed, based on the likelihood that TSW may need to maintain or repair the facility and that such activities will likely require a Site Development Permit and/or other regulatory permits. Subsections are organized based on the list of five facility types listed above.

Section 3 provides a summary of the evaluation completed for each of the selected facilities. Hydrology and hydraulic modeling and environmental assessments were used to determine if a flood risk reduction and/or extension of infrastructure longevity would be achieved and what project design features and mitigation measures would be implemented to avoid, minimize, and mitigate impacts. Subsections are organized according to Appendices A-1 through A-4, and Section 3.5 provides a list of sources used in these FMPs.

Section 4 provides additional information regarding program-level activities, some of which were evaluated for FMPs but where no maintenance or repairs are currently proposed. These additional facilities are included to address unforeseen additional O&M activities and provide for flexible and responsible implementation of TSW O&M while not significantly extending the approval timeline and/or increasing the need for substantial subsequent project-level environmental review.

Note that all analysis is based on the City's current inventory of facilities, which was last updated around 2008. As the City reviews the accuracy of its GIS data, it may be discovered that some areas in the MWMP may not be the City's responsibility to maintain, and other areas that should be the City's responsibility to maintain. As facilities are prioritized for maintenance, the City will verify maintenance responsibility by researching title reports.

2 FACILITIES SELECTION

The following types of facilities were evaluated to determine if an FMP would be proposed under the MWMP, as described previously:

1. Channels and basins that are part of the current MMP inventory
2. Facilities identified in the City's GIS conveyance layer
3. Facilities identified in the City's GIS structures layer
4. Facilities identified in the City's GIS permanent BMP layer
5. CIPs identified by City staff

Provided below is a description of how each these facility types were reviewed to determine if an FMP would be proposed. Facilities that were evaluated were divided into three groups: (1) channels and ditches, (2) basins, and (3) structures. Each facility was 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 divided into segments. Each segment is assigned a six-digit facility number that consists of three parts: a watershed number, drainage area number, and facility number. The result of the review was the selection of a total of 69 facility groups (129 segments) consisting of the following:

- channels and ditches (53 facility groups comprising 112 segments),
- basins (6 facility groups comprising 7 segments), and
- outlet/inlet structures (10 facility groups).

Facilities not carried forward for additional analysis to determine if an FMP would be proposed was 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 separate environmental document (e.g., environmental documents for CIPs that cover both 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.

2.1 CHANNELS AND BASINS (CURRENT MMP INVENTORY)

The current MMP inventory includes approximately 187 facilities, mostly consisting of channels identified in Draft and Final MMP, and extending approximately 50 linear miles (see Index Map).

Of these facilities, approximately 26 miles total were selected for evaluation to determine if an FMP would be proposed, based on meeting one of the following three categories:

1. All facilities that have been maintained since 2010 and will continue to need maintenance (approximately 11 miles of channels)
2. Additional facilities that are current high priorities for maintenance
3. Additional facilities 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

These categories represent the City's current prioritization of O&M actions to protect life and property most at risk of damage or injury.

2.2 ADDITIONAL CONVEYANCE FACILITIES

The City of San Diego has an inventory of 48,561 conveyance facilities (e.g., storm drainpipes, channels, culverts). This inventory was used in Step 2, incorporating elimination of the following:

- Facilities listed as maintained or owned by entities other than the City of San Diego (e.g., the California Department of Transportation (Caltrans), military, Port of San Diego, private, within flowage easements)
- Facilities listed as abandoned, inactive, removed, or unknown
- Facilities listed as pipes

Elimination of these facilities was based on maintenance or repair not likely to be the responsibility of TSW or maintenance or repair likely being conducted within developed rights-of-way with no disturbance to environmentally sensitive lands (ESL) or other regulated resources.

This elimination reduced the number of conveyance facilities for potential evaluation to:

- A total of 2,036 facilities (98 miles):
    - 1,587 channels (79 miles)

- 296 brow ditches (11 miles)
- 153 box culverts (8 miles)

Brow ditches and box culverts were not carried forward to Step 2, based on the maintenance or repair likely being conducted within developed rights-of-way with no disturbance to ESL or other regulated resources. The conveyance layer channels were found to mostly align with the current MMP inventory. Conveyance layer channels that are not part of the current MMP inventory are not anticipated to require routine maintenance, based on City staff experience and review of the mapped data, and therefore were not carried to Step 2.

2.3 STRUCTURAL FACILITIES

Structural facilities (e.g., inlets, outlets, connectors) were selected from 55,334 total structural facilities based on the first three criteria listed above for conveyance facilities and selecting outlets, headwalls, energy dissipators, spillways, tide gates, unknown facilities, wells, and desilting basins (caps, cleanouts, connectors, drop manholes, inlets, and sewer connectors were excluded).

This reduced the number of structural facilities selected for evaluation (in addition to the selected channels and conveyance facilities listed above) to the following:

- A total of 9,951 facilities:
  - 5,245 outlets
  - 3,732 headwalls
  - 764 energy dissipators
  - 123 spillways
  - 87 additional structures

The 9,951 structural facilities were separated according to data obtained from the City's ongoing canyon outfall assessment project. That project identified the following:

- 967 of the facilities as requiring maintenance (111 of these occur in canyons)
- 2,024 of the facilities were assessed but do not require maintenance (280 of these occur in canyons)
- 6,961 of the facilities were not assessed (1,024 of these occur in canyons)

A list of 22 structures that are most likely to require maintenance were identified based on the following criteria:

- Planned maintenance: structures where City crews have either completed maintenance in the past or they have been identified as needing maintenance in the near future.
- Structures with a diameter of ≥36 inches and a maintenance score of ≥3.9 according to canyon outfall assessment.

A field assessment was conducted for each of the facilities by City staff, often with support from Dudek. A determination was made regarding the need for maintenance and the potential for maintenance to impact an ESL or other regulated resources. A total of 10 structures were carried forward to Step 2.

2.4 BEST MANAGEMENT PRACTICES FACILITIES

Of the 3,724 BMP facilities (e.g., drainage inserts, vegetated swales, detention basins) in the City's GIS layer, facilities were selected based on the first three criteria listed above for conveyance facilities (i.e., TSW is likely responsible for maintenance). The following types of BMPs were excluded based on a low likelihood to result in an impact an ESL or other regulated resources, such that permits or CEQA evaluation would be required: baffle box, downspout filter, drainage insert, flow-through planter, filtration systems, hydrodynamic separator system, sand/oil interceptor, and unknown.

This reduced the number of BMP facilities selected for evaluation (in addition to the selected channels, conveyance, and structural facilities listed above) to the following:

- A total of 385 facilities:
    - 284 grass/vegetated swale/vegetated strips
    - 34 detention basins (grass/vegetation)
    - 36 detention basins (impervious lining)
    - 16 infiltration basin or trenches
    - 10 bioretention facilities
    - 5 wet ponds, constructed wetlands, or wetland vegetation swales

Based on review of these facilities and the O&M activities associated with them, the City determined that for a majority of these facilities, O&M activities were identified and permitted as part of the construction of the facilities or that there is a low likelihood that any additional activities would

result in an impact to an ESL or other regulated resources, such that permits or CEQA evaluation would be required. Six basin facilities either previously identified in the MMP or identified by City staff were the only facilities carried forward to for additional evaluation. Based on the factors listed above, no other BMPs were carried forward.

2.5 CAPITAL IMPROVEMENT PROJECTS

A number of CIPs were identified; however, all are being designed, developed, and permitted through a separate process and by a separate City department (Public Works Department). This separate process typically includes consideration of ongoing O&M activities, such that any future TSW maintenance activities at these locations will likely be covered under the environmental review conducted for each CIP. Furthermore, because CIPs are still in development, a project-level evaluation could not be conducted; therefore, no CIPs were carried forward.

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3 PROJECT-LEVEL EVALUATION

At total of 69 facility groups (129 segments or structures) were identified for Step 2 (i.e., project-level evaluation) (Figure 1, Index, and Figures 1-1 through 1-14). The facility evaluation process is identified in detail in Section 3.2 of the MWMP. Technical summaries are compiled for all facilities; based on the technical evaluation, either maintenance is proposed for the facility and an FMP is prepared, or no maintenance is proposed and only the technical summary is prepared.

Separate evaluations were completed for channels/ditches, basins, and structures; additional maintenance methods that may be required in several project-level facilities (i.e., concrete repair and check dams) are also identified.

3.1 PROPOSED CHANNEL AND DITCH FMPS

A total of 53 channel/ditch facility groups (112 segments) were evaluated under Step 2. Of these, 96 channel or ditch segments have proposed FMPs (see Appendix A-1) and 18 segments do not have a proposed FMP (see Appendix A-5). See Table 1 for the evaluated channel and ditch facilities.

3.2 PROPOSED BASIN FMPS

A total of 6 facility groups (7 segments) were evaluated under Step 2. All 7 segments have proposed FMPs (see Appendix A-2). See Table 2 for the evaluated basin facilities.

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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								
2-01-000	Los Peñasquitos Canyon Creek - Sorrento	Sorrento Valley	1	Earthen	Yes – City	Partially Within and Adjacent	N/A	2,347
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

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
2-01-130	Los Peñasquitos Lagoon - Tripp	Tripp	1	Concrete	Yes – City	N/A	1,835	1,835
2-01-200	Los Peñasquitos Canyon Creek - Black Mountain	Black Mountain	1	Earthen	—	Adjacent	952	952
2-01-210	Los Peñasquitos Canyon Creek - Black Mountain	Black Mountain	2	Earthen	—	Partially Within and Adjacent	959	959
2-03-000	Soledad Canyon Creek - Sorrento	Roselle	1	Earthen	Yes – City	N/A	215	1,554
2-03-002	Soledad Canyon Creek - Sorrento	Roselle	2	Concrete	Yes – City	N/A	2,314	2,314
2-03-004	Soledad Canyon Creek - Sorrento	SorValRd	1	Earthen	Yes – City	Partially Within and Adjacent	N/A	5,283

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
2-03-006	Soledad Canyon Creek - Sorrento	SorValRd	2	Earthen	—	Adjacent	N/A	1,473
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 – Mission Bay High School (MBHS)	Pacific Beach (PB)-Olney	1	Earthen	Yes – City	Partially Adjacent	910	910

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
3-02-103	Mission Bay - MBHS	MBHS	1	Concrete	Yes – City	N/A	1,058	1,058
3-02-130	Mission Bay - Mission Bay Drive	Mission Bay Drive	1	Earthen	Yes – CCC	N/A	1,085	1,085
3-03-901	Miramar - Engineer	Engineer	1	Concrete	—	N/A	1,220	1,220
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
3-04-101	Tecolote Creek - Morena	Morena	1	Earthen	—	N/A	N/A	200
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

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
4-01-107	San Diego River - Nimitz	Nimitz	3	Earthen	—	N/A	476	476
4-01-120	San Diego River - Valeta	Valeta	1	Concrete	Yes – City	Adjacent	161	161
4-03-101	San Diego River - Camino del Rio	Camino del Arroyo	1	Concrete	—	N/A	642	642
4-03-103	San Diego River - Camino del Rio	Camino del Rio	1	Concrete	—	N/A	1,019	1,019
4-04-000	Murphy Canyon Creek - Stadium	Stadium	1	Earthen	—	Partially Adjacent	1,661	1,661
4-04-002	Murphy Canyon Creek - Stadium	Stadium	2	Concrete	—	N/A	207	207
4-04-006	Murphy Canyon Creek - Stadium	Murphy Canyon	1	Concrete	—	N/A	532	532

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
4-04-008	Murphy Canyon Creek - Stadium	Murphy Canyon	2	Earthen	—	N/A	N/A	1,524
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 1
Channel and Ditch Facilities Evaluated for Potential FMP

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

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
4-08-017	Norfolk Canyon Creek - Fairmount	Fairmount	4	Concrete	—	Partially Within and Adjacent	1,250	1,250
4-08-105	Norfolk Canyon Creek - Fairmount	Baja	1	Earthen and Concrete	—	Partially Adjacent	1,369	1,369
4-08-150	Norfolk Canyon Creek - Fairmount	Aldine	1	Earthen	—	Partially Within and Adjacent	N/A	1,240
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 Hills Canyon Creek - Titus	Titus	1	Earthen	—	Partially Within and Adjacent	39	207

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
5-03-011	Powerhouse Canyon Creek - Pershing	Pershing	1	Concrete	—	N/A	1,598	1,598
5-03-100	Powerhouse Canyon Creek - Pershing	Pershing	2	Concrete	—	N/A	437	437
5-03-901	San Diego Bay - 28th St	28th St	1	Earthen	—	N/A	67	67
5-04-004	Chollas Creek - National	National	1	Earthen and Concrete	Yes – City	N/A	816	1,976
5-04-006	Chollas Creek - National	National	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

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
5-04-163	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
5-04-229	Auburn Creek - Home	Home	4	Earthen and Concrete	—	Adjacent	N/A	754
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
5-04-241	Auburn Creek - Wightman	Wightman	2	Earthen and Concrete	—	N/A	645	645
5-04-245	Auburn Creek - Oakcrest	Oakcrest	1	Earthen	—	N/A	N/A	333
5-04-260	Chollas Creek - Megan	Megan	1	Concrete	—	Adjacent	849	849

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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]
5-04-262	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
5-05-019	South Chollas Creek - Euclid	Euclid	1	Earthen	—	N/A	N/A	904
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 1
Channel and Ditch Facilities Evaluated for Potential FMP

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							
5-05-304	South Chollas Creek Encanto Branch - Imperial	Imperial	1	Earthen	—	N/A	N/A	2,554
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
5-05-606	South Chollas Creek Encanto Branch - Jamacha	Jamacha	2	Earthen	—	N/A	N/A	816
5-05-610	South Chollas Creek Encanto Branch - Jamacha	Jamacha	3	Earthen	—	N/A	N/A	752

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

Facility Number	Facility Group Name	Segment Name	Segment Number	Substrate	Coastal Zone - Permit Authority	Multi-Habitat Planning Area	Linear Feet of Maintenance Proposed[1]	Total Linear Feet[1]
5-05-702	South Chollas Creek Encanto Branch - Jamacha	Lobrico	1	Earthen	—	N/A	N/A	330
5-05-802	South Chollas Creek Encanto Branch - Jamacha	Cadman	1	Earthen	—	N/A	N/A	305
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
5-06-025	Paleta Creek - Solola	Cervantes	1	Earthen	—	N/A	N/A	2,564
Sweetwater Watershed								
5-11-003	Sweetwater River - Parkside	Parkside	1	Concrete	—	N/A	1,197	1,197

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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

Table 1
Channel and Ditch Facilities Evaluated for Potential FMP

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 & Smuggler's	Smuggler's Gulch	1	Earthen	Yes – City	Within	3,026	3,875
6-02-115	Tijuana River - Tocayo	Tocayo	1	Earthen	Yes – City	N/A	N/A	96
6-02-118	Tijuana River - Tocayo	Tocayo	2	Concrete	Yes – City	N/A	2,498	2,498
6-03-135	Tijuana River - Smythe	Via Encantadoras	1	Earthen	Yes – City	N/A	120	120
6-03-138	Tijuana River - Smythe	Via Encantadoras	2	Concrete	—	N/A	955	955
6-03-143	Tijuana River - Smythe	Via Encantadoras	3	Earthen and Concrete	—	N/A	886	886
6-03-147	Tijuana River - Smythe	Smythe	1	Earthen	—	N/A	1,355	1,355
6-03-150	Tijuana River - Smythe	Via de la Bandola	1	Concrete	—	N/A	716	716
6-06-011	Tijuana River - La Media	La Media	1	Earthen	—	Adjacent	5	223

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

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

Table 2
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

Table 2
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]
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.

3.3 PROPOSED STRUCTURE FMPS

A total of 10 facility groups (10 structures) were evaluated under Step 2. All 10 segments have proposed FMPs (see Appendix A-3). See Table 3 for the evaluated structural facilities.

Table 3
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

3.4 PROPOSED ADDITIONAL MAINTENANCE METHODS

The FMPs listed in Appendices A-1 through A-3 provide details regarding proposed maintenance removal of sediment, vegetation, trash/debris, and in some cases bank repair. Two sets of additional maintenance methods are also proposed and could be used in conjunction with a site-specific FMP, where concrete repair, culvert clearing, structural maintenance/repair, and post-maintenance erosion control measures are required. For example, if a concrete-lined channel requires sediment and vegetation removal, these could be conducted using the site-specific FMP included for that site in Appendix A-1. If the concrete-lined channel requires repair, the methodology for that activity is included in the maintenance methods provided in Appendix A-4. Similarly, if a channel requires post-maintenance erosion control, the selected methodology could be used in conjunction with a site-specific FMP.

3.5 SOURCES USED TO DEVELOP FMPS

Table 4 list the sections and line items that are included in each FMP along with the sources of data and documentation used for each. A comprehensive literature cited is included as Section 5.

Table 4
FMP Sections and Associated Data Sources

FMP Section/Line Item	Data Source(s)
Facility Group Overview and Segment Details	
Watershed Management Area	Water Quality Improvement Plans (Responsible Agencies San Dieguito River WMA 2015; Responsible Agencies Los Peñasquitos WMA 2015; Responsible Agencies Mission Bay WMA 2016; Responsible Agencies San Diego River WMA 2016; Responsible Agencies San Diego Bay WMA 2016; Responsible Agencies Tijuana River WMA 2016)
Watershed, Hydrologic Subarea	GIS Data (SANGIS 2018)
Drainage Name, Facility Group Name, Segment Name	No prior documentation – data/naming developed specifically for the MWMP
Facility Type, Substrate, Substrate Detail, Facility Length, Top-of-Bank Width, Bottom Facility Width, Facility Depth, As-built Drawing No.	MWMP Environmental Impact Report – Appendix I (Hydraulic & Hydrology Technical Report including Appendix A Fact Sheets)
MMP Map No.	Master Storm Water System Maintenance Program (City of San Diego 2013)
Facility Inspection No.	Rick Engineering GIS data
Other Former Names	City staff, Prior Facility Documentation
Adjacent Land Use	GIS Data (SANGIS 2018)
Coastal Zone	GIS Data (SANGIS 2018)
Water Quality Resources Summary	
Adopted TMDLs	Basin Plan (RWQCB 2016), TMDL and Water Quality Report Cards (RWQCB 2018b)
Highest Priority Water Quality Condition	Water Quality Improvement Plans, Basin Plan
Beneficial Uses	Basin Plan
303(d) list Impairments	Surface Water Quality Assessment and Section 303(d) List of Water Quality Limited Segments (RWQCB 2018a)
Cultural Resource Summary	
Cultural Resource Summary	MWMP Environmental Impact Report Appendix F – Cultural Resource Technical Report

Table 4
FMP Sections and Associated Data Sources

FMP Section/Line Item	Data Source(s)
Best Management Practices and Mitigation Measures	
	MWMP Environmental Impact Report Appendix A – Municipal Waterways Maintenance Plan
Proposed MWMP Activities and Methods Summary	
	MWMP Environmental Impact Report Appendix A – Municipal Waterways Maintenance Plan
Facility Maintenance History	
History of Maintenance, Past Regulatory Approvals, Mitigation for Previous Impacts	Master Storm Water System Maintenance Program Recirculated Final Environmental Impact Report (City of San Diego 2013) Addendum to Storm Water System Maintenance Program Environmental Impact Report (City of San Diego 2018a) Master Maintenance Program Annual Reports (2014–2018) (2018b) City of San Diego Substantial Conformance Review for Routine Maintenance of 10 facilities (City of San Diego 2018c) USACE/RWQCB/City RGP 63 Emergency Maintenance Notifications for 14 facilities (City of San Diego 2018d)
Hydrology and Hydraulics Summary	
Current Conditions Affecting Facility Capacity, Hydrologic Peak Flows, Hydraulic Capacity, Maintenance Recommendations, Post-Maintenance Erosion Control Recommendation	MWMP Environmental Impact Report – Appendix I (Hydraulic & Hydrology Technical Report including Appendix A Fact Sheets)
Biological Resource Summary	
Facility Vegetation, Adjacent Vegetation, Habitat and Wildlife, MHPA, Mitigation Within Facility	MWMP Environmental Impact Report – Appendix D (Biological Resources Technical Report)
Maintenance Methods	
Maintenance Quantities, Access/Loading/Staging/Stockpiling Areas, Equipment, Schedule, Staffing, Methodology, Traffic Control, Existing Plans/As-Builts, Other Notes	MWMP Environmental Impact Report Appendix A – Municipal Waterways Maintenance Plan, City Staff

4 PROGRAM-LEVEL ACTIVITIES

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 Site Development Permit and Coastal Development Permit 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. Therefore a program-level analysis is included and focuses on a limited set of maintenance activities that would be allowed, as described in Section 3.3 of the MWMP:

- Minor maintenance or repair activities
- Changed conditions for new or substantially amended FMPs
- Emergency maintenance

Although these activities may occur anywhere within the City limits, Figures 1-1 through 1-14 identify the areas where most of the facilities that may be subject to these additional plan-wide activities occur. Appendix A-6 includes a list of these additional facilities that are annually inspected where limited program-level activities may occur. This list also includes Appendix A-5 facilities that have technical summaries but no maintenance (i.e., no FMP) is proposed. If changed conditions within any of these additional facilities require the need to conduct routine maintenance, an amendment to the MWMP will be required. An amendment will include the project-level analyses needed to determine conformance with the MWMP, as well as the associated regulatory permits and certified EIR.

5 LITERATURE CITED

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City of San Diego. 2018a. Addendum to Storm Water System Maintenance Program.

City of San Diego. 2018b. *Master Maintenance Program Annual Reports 2014–2018*. https://www.sandiego.gov/stormwater/services/mswsmp.

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Responsible Agencies Los Peñasquitos WMA (Watershed Management Area). 2015. *Los Peñasquitos Watershed Management Area Water Quality Improvement Plan*.

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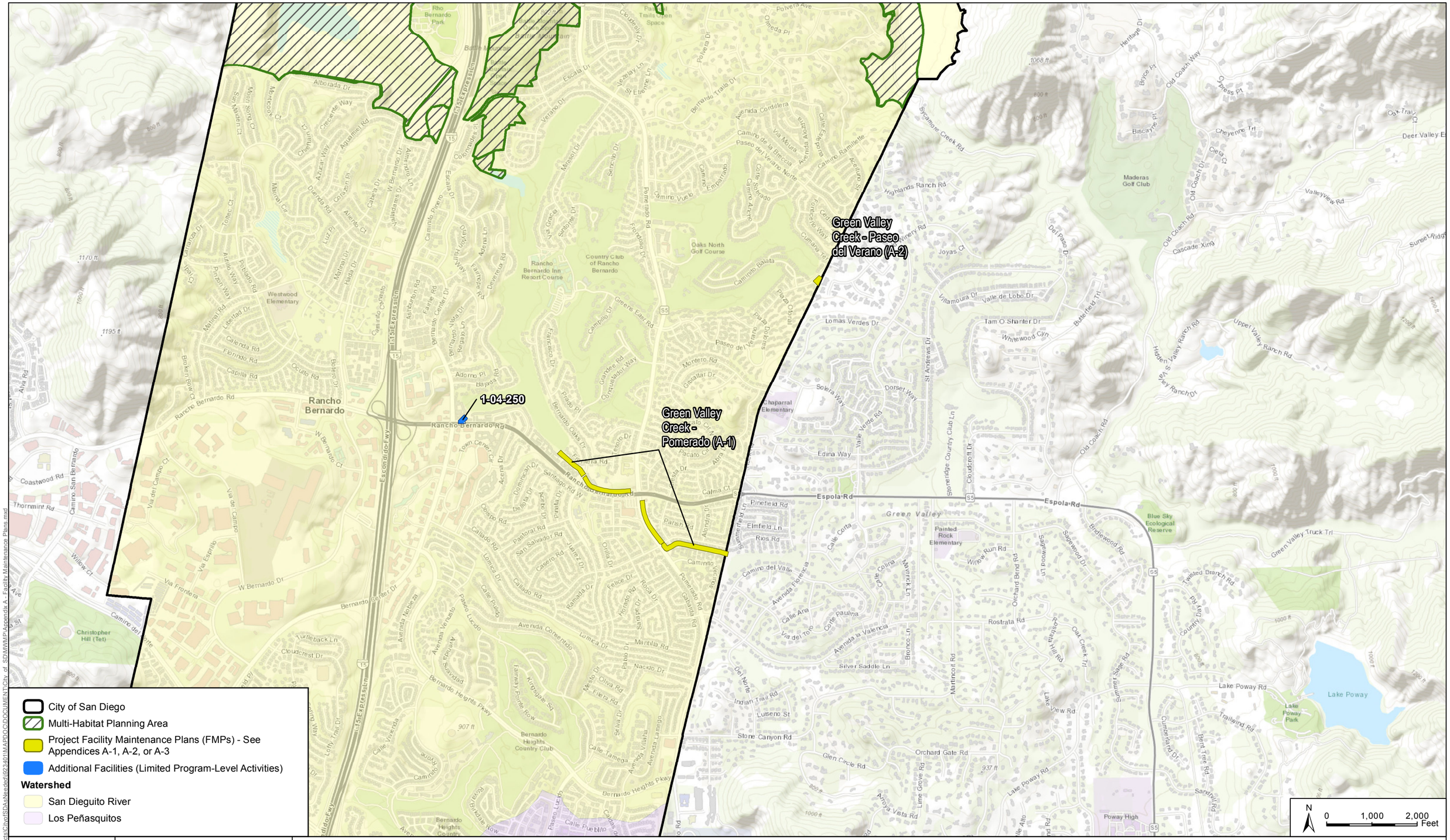

SOURCE: ESRI 2017

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The City of SAN DIEGO

Appendix A - Sheet 1

Municipal Waterways Maintenance Plan

Figure 1-1

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Chicarita Creek - Via San Marco (A-1)

Los Penasquitos Canyon Creek - Black Mountain (A-1)

2-04-130

2-01-230

City of San Diego

Multi-Habitat Planning Area

Project Facility Maintenance Plans (FMPs) - See Appendices A-1, A-2, or A-3

Additional Facilities (Limited Program-Level Activities)

Watershed

San Dieguito River

Los Peñasquitos

N

0 1,000 2,000 Feet

SOURCE: ESRI 2017

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The City of SAN DIEGO

Appendix A - Sheet 2

Municipal Waterways Maintenance Plan

Figure 1-2

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Penasquitos Lagoon - Industrial (A-1)

Penasquitos Lagoon - Tripp (A-1)

Los Penasquitos Canyon Creek - Sorrento (A-5)

Soledad Canyon Creek - Filntkote (A-1)

2-01-003

Los Penasquitos Canyon Creek - 5805 Basin (A-2)

Soledad Canyon Creek - Roselle (A-1)

Soledad Canyon Creek - Dunhill (A-1)

10405 Sorrento Valley Road (A-3)

Soledad Canyon Creek - Sorrento (A-5)

2-03-250

2-03-220

Carroll Canyon Creek - Carroll (A-1)

2-03-010

2-03-008

2-03-020

City of San Diego

Coastal Zone

Multi-Habitat Planning Area

Project Facility Maintenance Plans (FMPs) - See Appendices A-1, A-2, or A-3

Facilities Evaluated (No FMP Proposed) - See Appendix A-5

Additional Facilities (Limited Program-Level Activities)

Watershed

Los Peñasquitos

Mission Bay

N

0 1,000 2,000 Feet

SOURCE: ESRI 2017

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The City of SAN DIEGO

Appendix A - Sheet 3

Municipal Waterways Maintenance Plan

Figure 1-3

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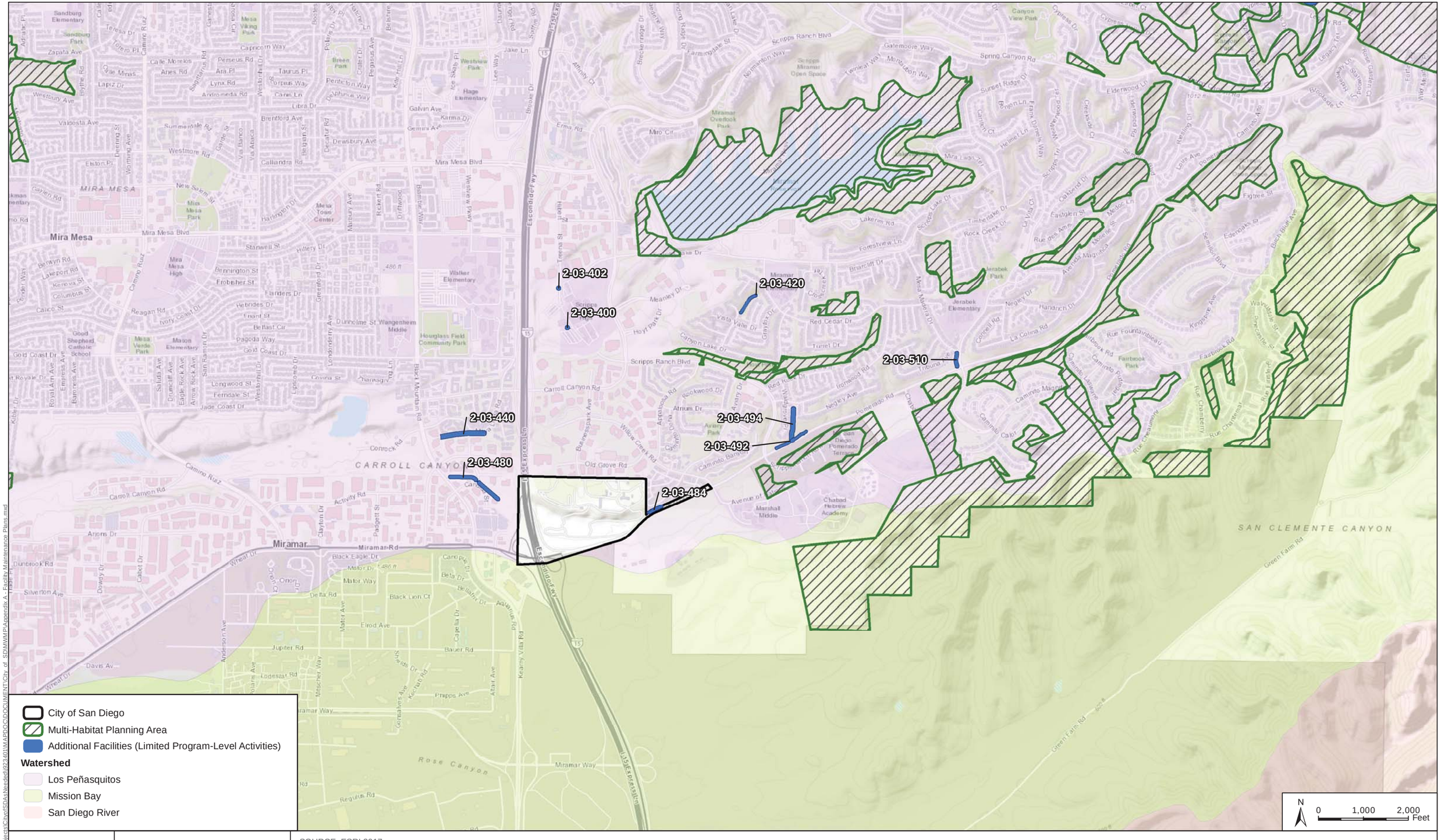

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The City of SAN DIEGO

Appendix A - Sheet 4

Municipal Waterways Maintenance Plan

Figure 1-4

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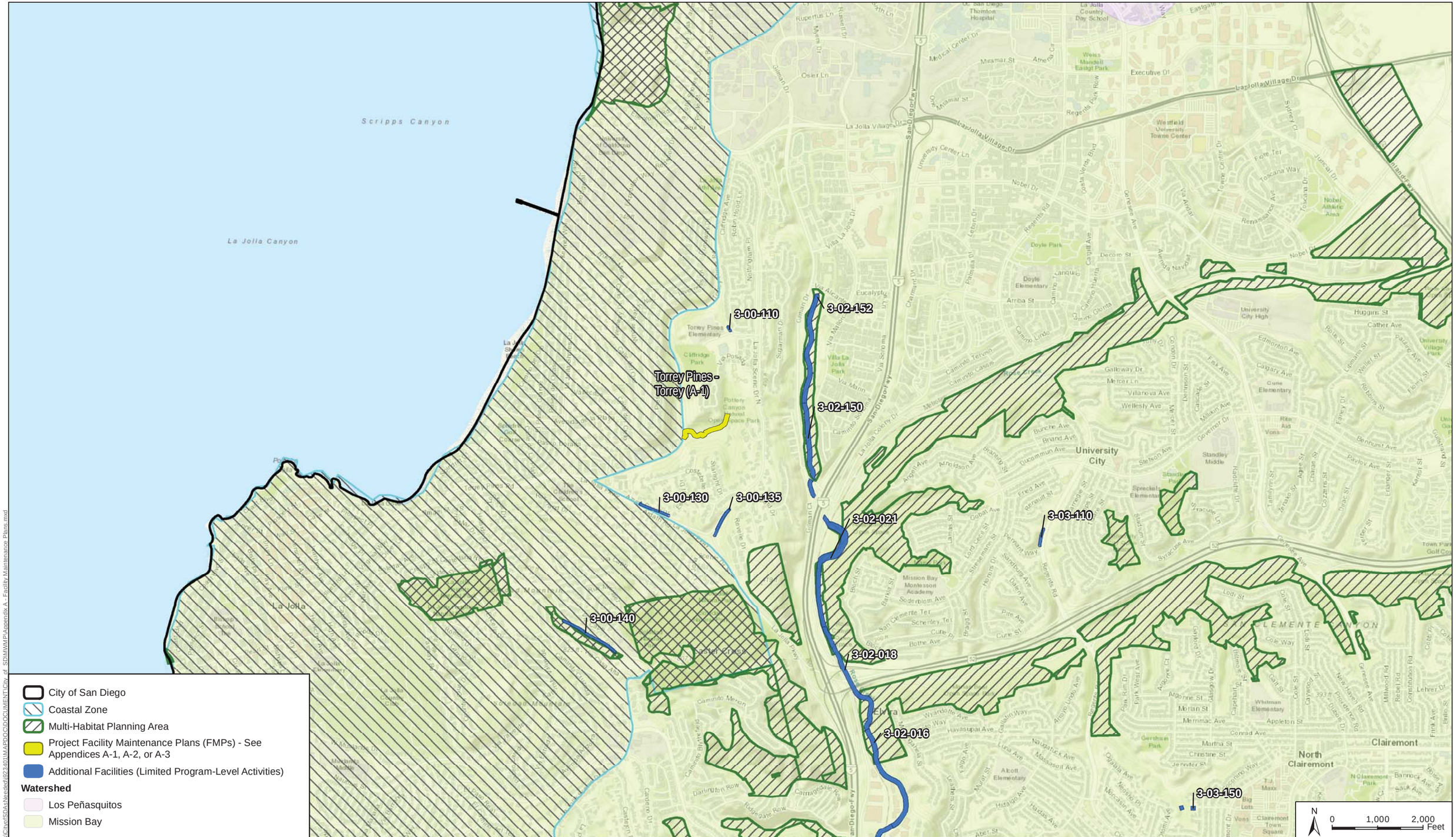

SOURCE: ESRI 2017

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The City of SAN DIEGO

Appendix A - Sheet 5

Municipal Waterways Maintenance Plan

Figure 1-5

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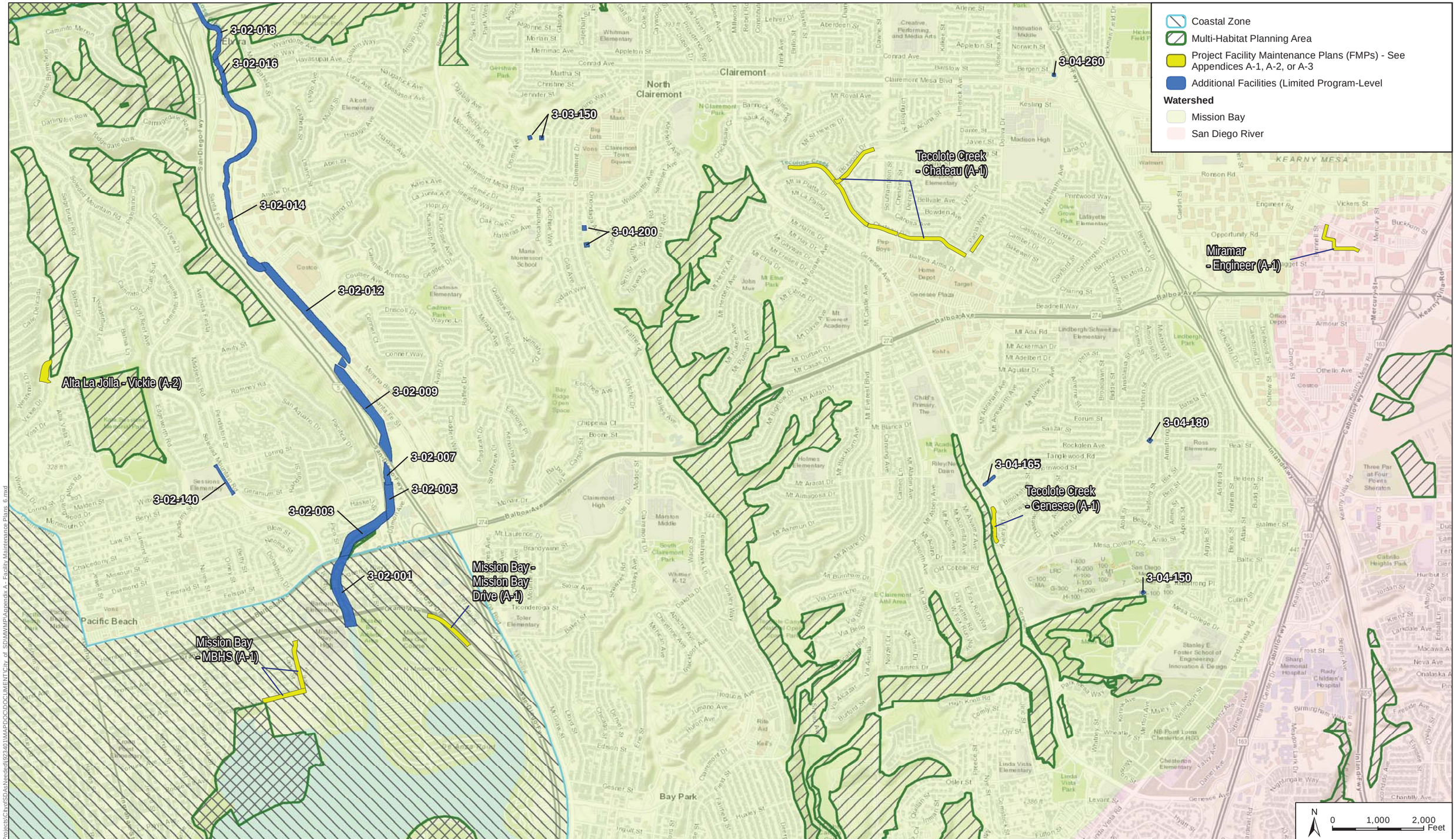

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Appendix A - Sheet 6

Municipal Waterways Maintenance Plan

Figure 1-6

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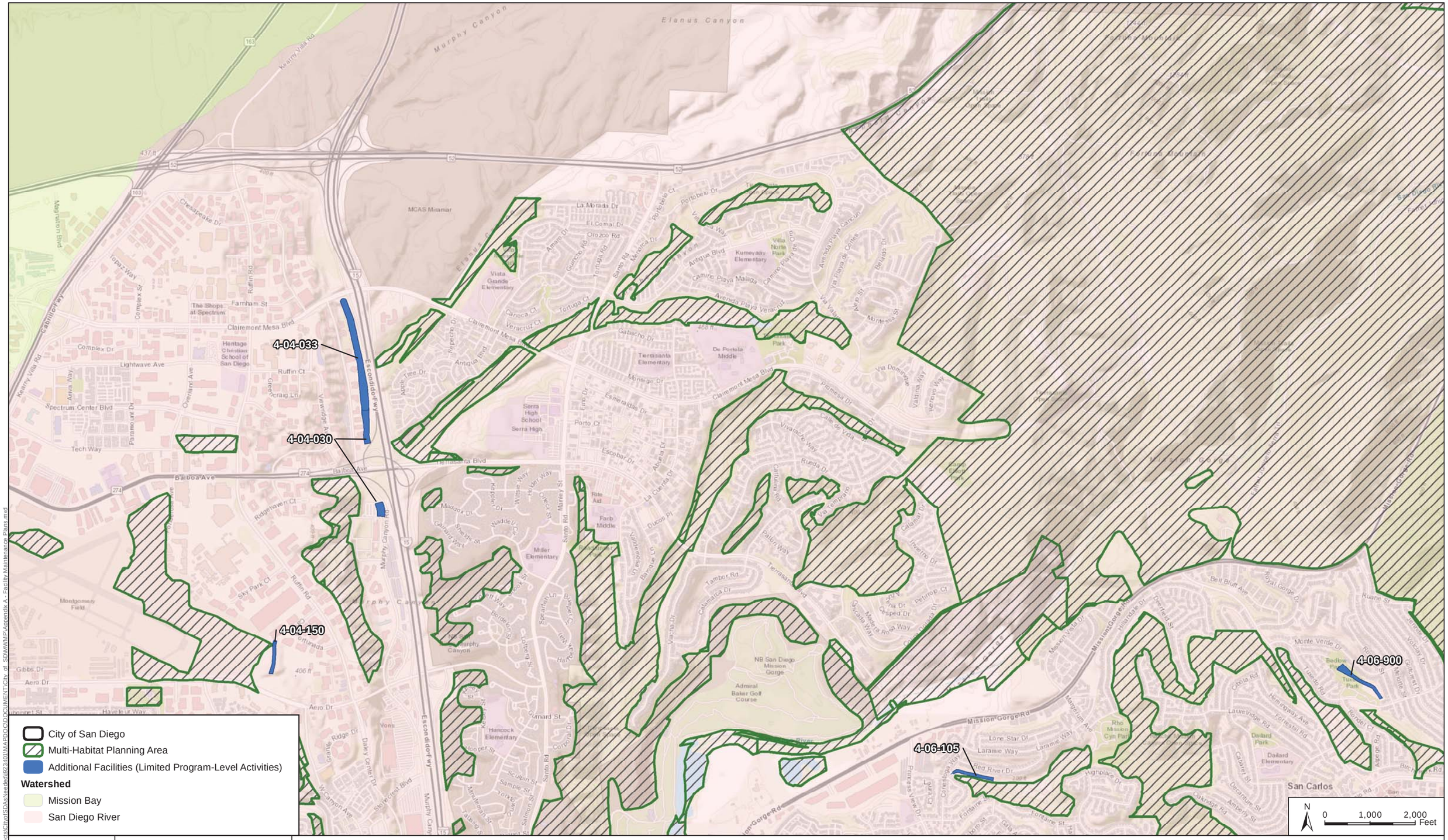

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Appendix A - Sheet 7

Municipal Waterways Maintenance Plan

Figure 1-7

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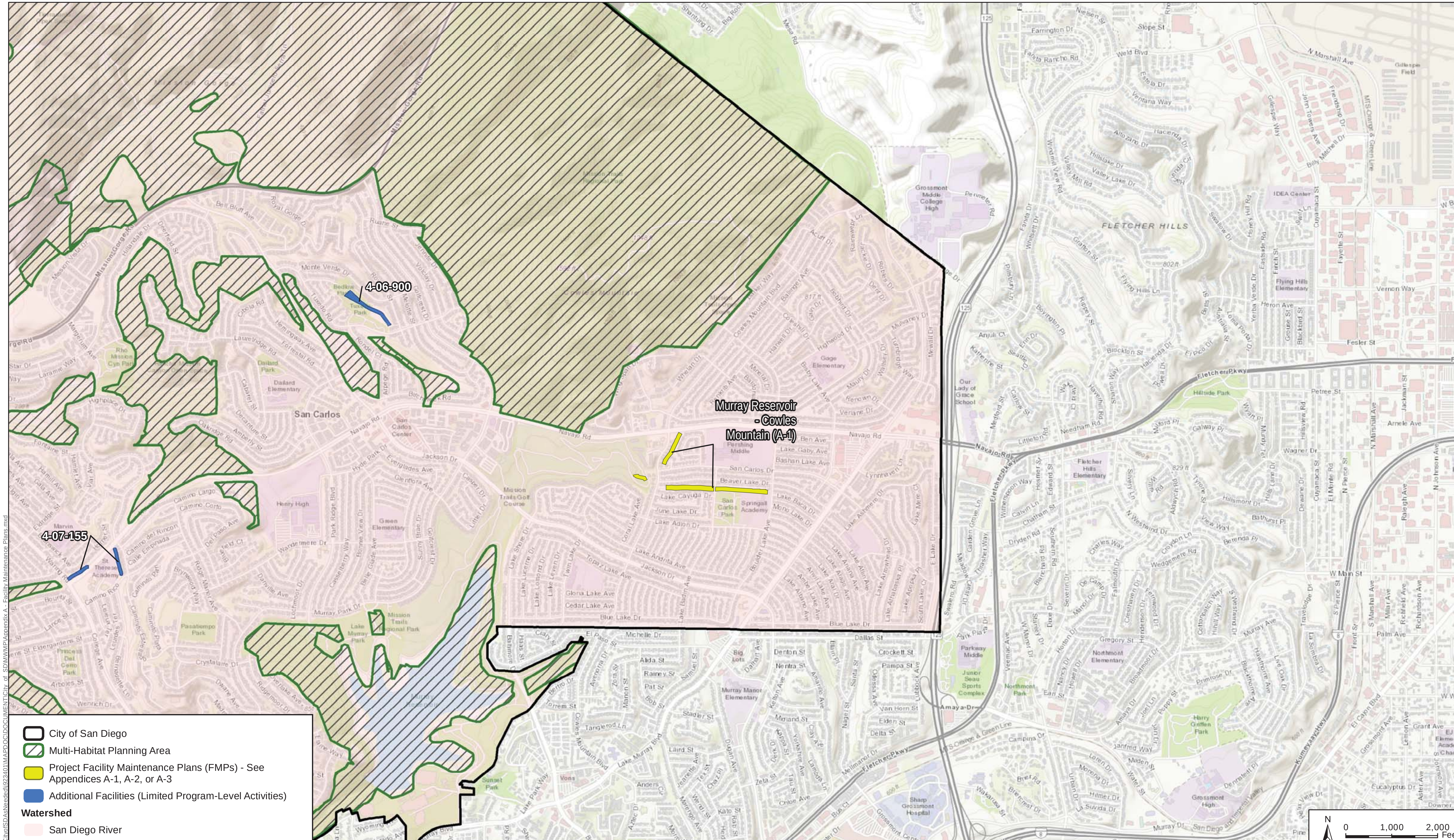

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The City of SAN DIEGO

SOURCE: ESRI 2017

Appendix A - Sheet 8

Municipal Waterways Maintenance Plan

Figure 1-8

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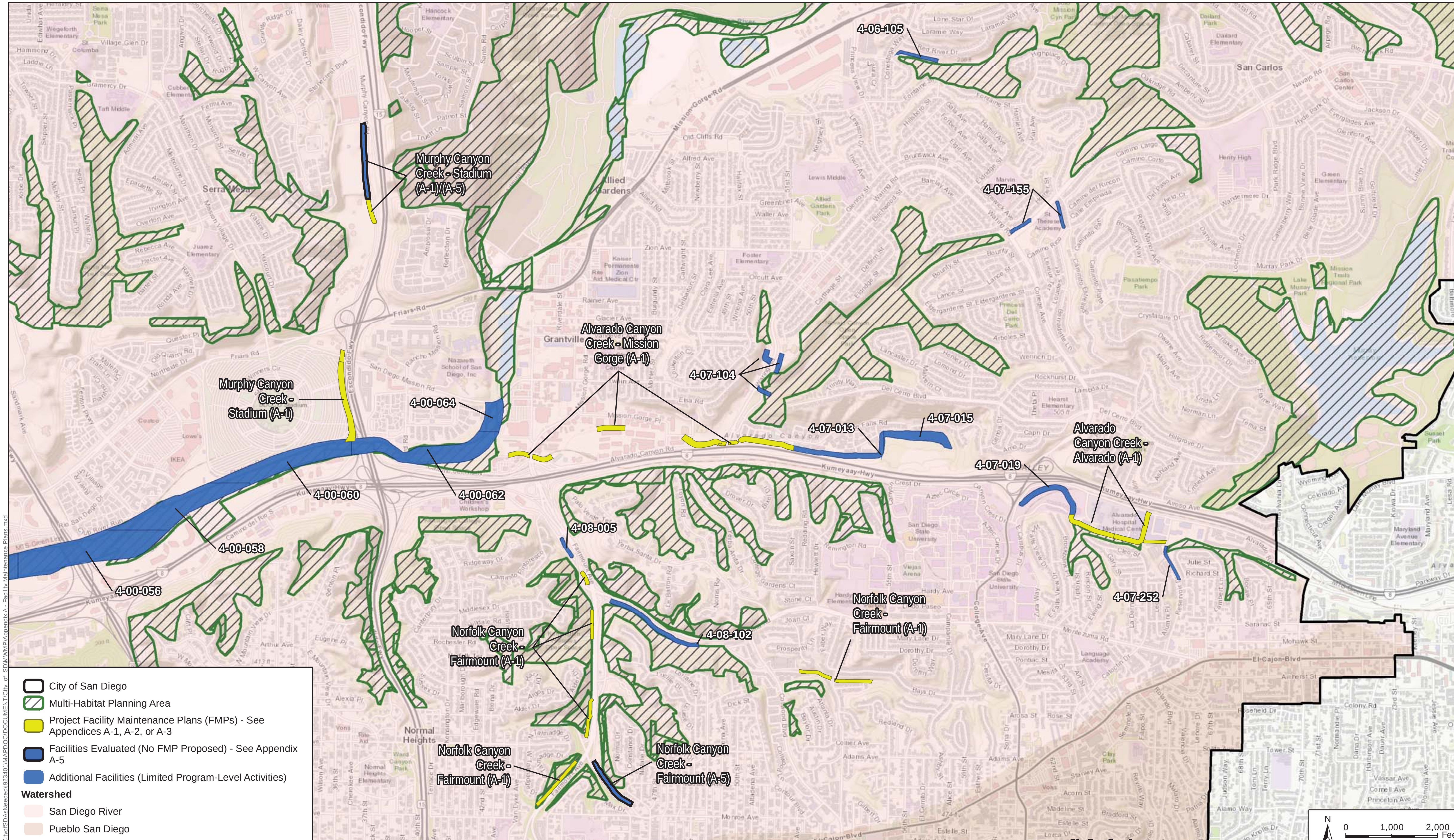

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The City of SAN DIEGO

Municipal Waterways Maintenance Plan

Appendix A - Sheet 9

Figure 1-9

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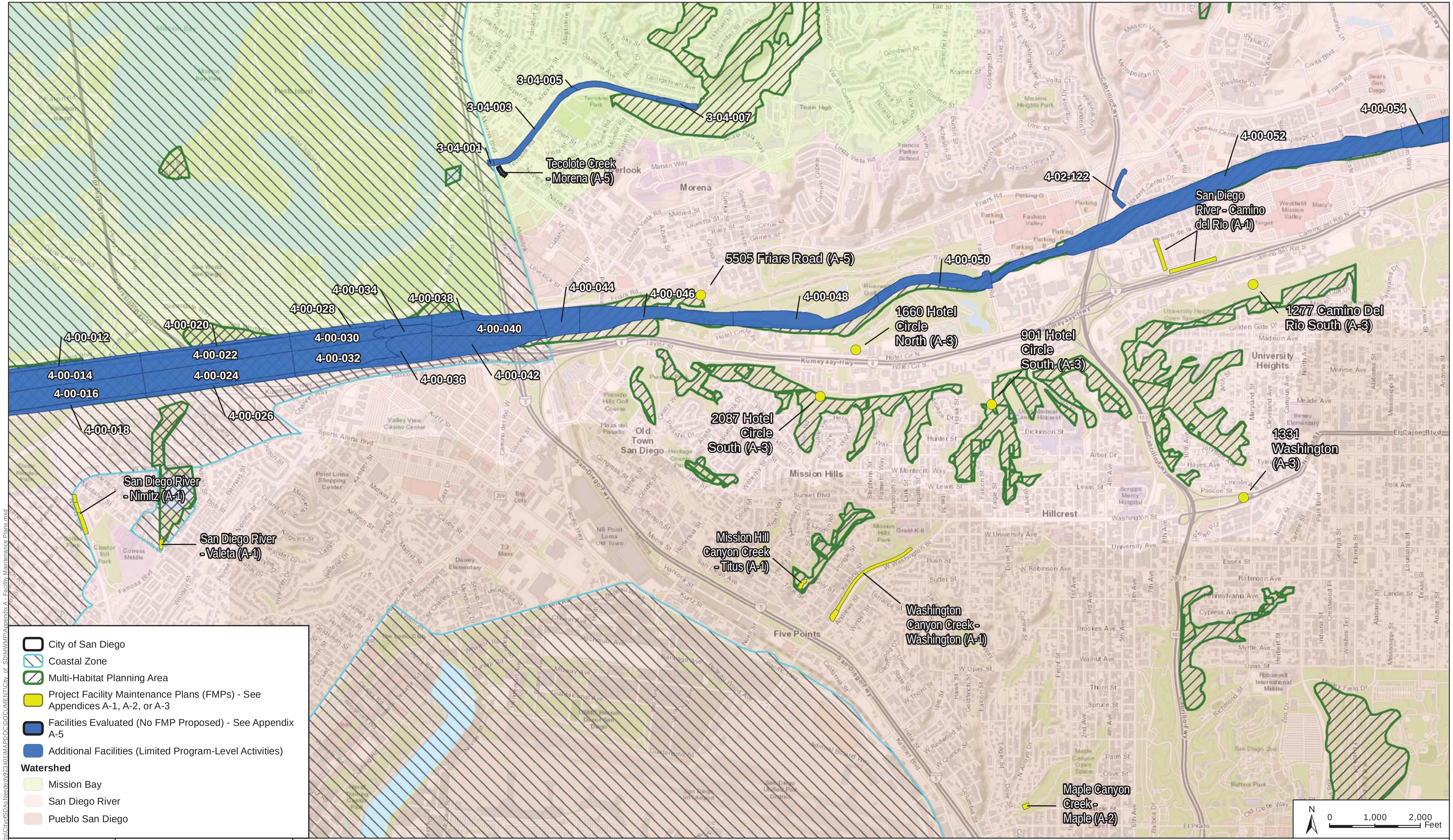

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Appendix A - Sheet 10

Municipal Waterways Maintenance Plan

Figure 1-10

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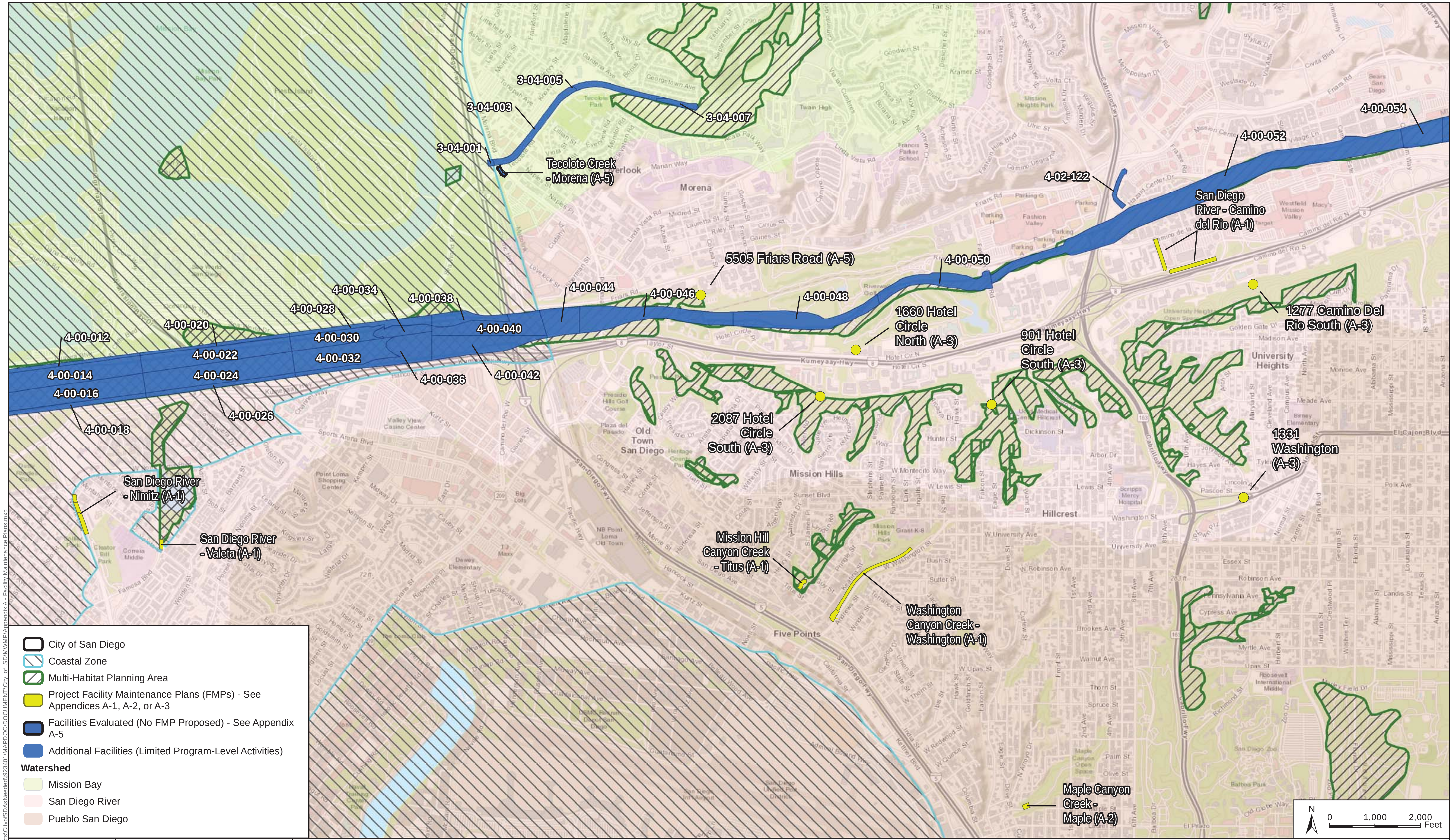

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The City of SAN DIEGO

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Appendix A - Sheet 10

Municipal Waterways Maintenance Plan

Figure 1-10

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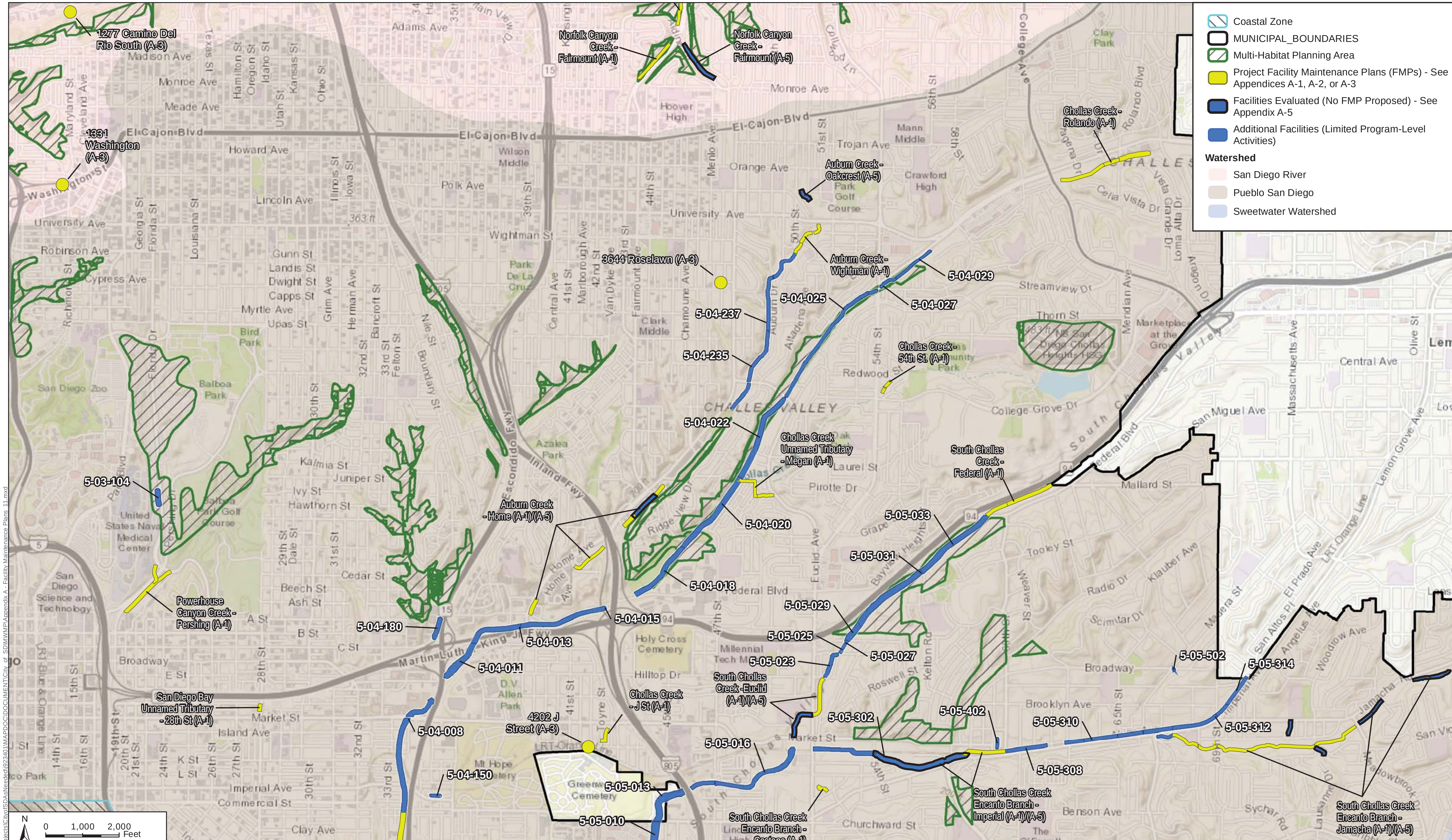

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The City of SAN DIEGO

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Appendix A - Sheet 11

Municipal Waterways Maintenance Plan

Figure 1-11

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5-04-011
5-04-008
5-04-150
5-04-002
5-04-000
5-05-002
5-05-004
5-05-103
5-05-100
5-05-013
5-05-010
5-05-016
5-05-025
5-05-023
5-05-402
5-05-308
5-05-302
5-05-310
5-05-312
5-05-314
5-05-502
5-07-010
5-07-150
Chollas Creek - J St (A-1)
4202 J Street (A-3)
South Chollas Creek - Euclid (A-1)/(A-5)
South Chollas Creek Encanto Branch - Imperial (A-1)/(A-5)
South Chollas Creek Encanto Branch - Jamacha (A-1)/(A-5)
South Chollas Creek Encanto Branch - Castana (A-1)
Chollas Creek - National (A-1)
Chollas Creek Unnamed Tributary - Martin (A-1)
South Chollas Creek - Southcrest (A-1)
Paleta Creek - Solola (A-1)/(A-5)
1206 Goodyear (A-3)
Paleta Creek - Cottonwood (A-1)
Sweetwater River - Parkside (A-1)
South Chollas Valley
Seventh Street Channel
Paradise Creek
Paradise Hills
Lincoln
National City
Inland Fwy
Martin Luther King Jr Fwy

- City of San Diego
- Coastal Zone
- Multi-Habitat Planning Area
- Project Facility Maintenance Plans (FMPs) - See Appendices A-1, A-2, or A-3
- Facilities Evaluated (No FMP Proposed) - See Appendix A-5
- Additional Facilities (Limited Program-Level Activities)

Watershed

- Pueblo San Diego
- Sweetwater

N
0 1,000 2,000 Feet

SOURCE: ESRI 2017

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Municipal Waterways Maintenance Plan

Figure 1-12

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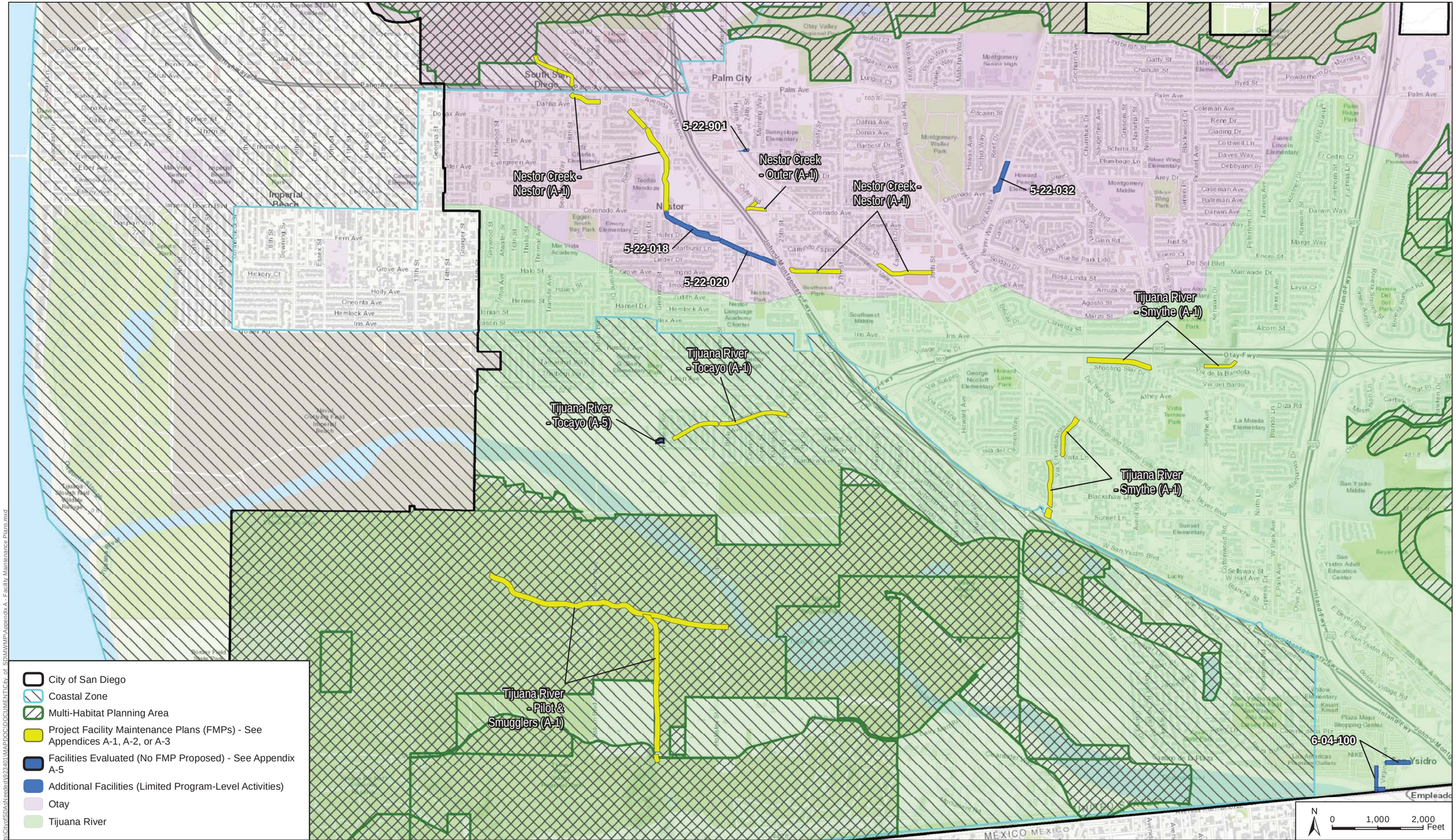

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Appendix A - Sheet 13

Municipal Waterways Maintenance Plan

Figure 1-13

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Spring Canyon Creek - Cactus (A-2)

6-04-255

Tijuana River - La Media (A-1)

Tijuana River - Siempre Viva (A-2)

6-06-900

City of San Diego

Multi-Habitat Planning Area

Project Facility Maintenance Plans (FMPs) - See Appendices A-1, A-2, or A-3

Additional Facilities (Limited Program-Level Activities)

Otay

Tijuana River

N

0 1,000 2,000 Feet

SOURCE: ESRI 2017

DUDEK

Appendix A - Sheet 14

Municipal Waterways Maintenance Plan

Figure 1-14

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