

Master Storm Water System Maintenance Program Annual Report

Prepared by:



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EXECUTIVE SUMMARY

Under Council Policy 800-04, the City of San Diego (City) is responsible for maintaining adequate drainage facilities for the protection of life and property. Due to the environmental sensitivity of the flood control channels that the City maintains, the Transportation & Storm Water Department's Storm Water Division (SWD) adopted the Master Storm Water System Maintenance Program (MMP) to perform channel maintenance activities for flood control in a manner that minimizes environmental impacts associated with channel maintenance. The MMP includes storm water facilities, specifically open channels, which the Storm Water Division has the responsibility to maintain.

A Programmatic Environmental Impact Report (PEIR) was prepared to support the MMP, and in August 2013 the City approved Site Development Permit (SDP) Number 1134892 for the program. Pursuant to Section 5.5 of the MMP and in accordance with PEIR Mitigation Measure 4.3.8, the Storm Water Division provides this Annual Report to document flood control channel maintenance activities and associated mitigation implemented over the past fiscal year, July 1, 2016 - June 30, 2017 (FY 2017).

Maintenance activities performed as part of the MMP have generally been conducted between September 15 and March 15 to avoid potential impacts to nesting birds. Formal regulatory approval and implementation of detailed protocol survey mitigation measures have allowed the City to conduct maintenance activities as-needed and weather permitting throughout the calendar year for some channel areas.

During FY 2017, the Storm Water Division performed planned maintenance activities in the following channel areas:

- Tijuana River Valley Pilot Channel and Smuggler's Gulch (MMP Maps 138 a, b, c, 139)
- Sorrento Valley Reach 7 (Flintkote Channel) and Reach 3 (Soledad Creek Channel) (MMP Maps 9, 11, 12)

Compensatory mitigation for impacts to wetland resources is required as part of the MMP. Wetlands mitigation for the Tijuana River Pilot Channel and Smuggler's Gulch channels (MMP Maps 138 a, b, c, and 139) was continued during FY 2017 within and adjacent to the channel maintenance footprint. Wetlands mitigation for the Murphy Channel and Alvarado Channel maintenance projects has been reserved at a City mitigation site near Qualcomm Stadium. Wetlands mitigation for Sorrento Valley Reach 3 and 7 and Mission Bay High School and Pacific Beach/Olney Street Channels is being implemented. Site suitability searches are underway for

mitigation related to wetland resources from emergency maintenance activities that occurred in past years. Uplands mitigation will be in the form of payment into the City's Habitat Acquisition Fund or Cornerstone Lands in accordance with Mitigation Measure 4.3.11 of the PEIR. The Storm Water Division maintained compliance with all regulatory permits and agreements during the maintenance activities for all channels.

1 INTRODUCTION

The City of San Diego (City) operates and maintains approximately 50 miles of drainage channels to convey storm water and urban runoff for the purpose of reducing flood risk and to provide essential public services. Maintenance of channels primarily involves the removal of vegetation and/or sediment to maximize storm water conveyance capacity of the City's municipal separate storm sewer system (MS4). Additionally, maintenance activities can also include repair of damaged infrastructure and removal of invasive plant species and debris.

Under Council Policy 800-04, the City is responsible for maintaining adequate drainage facilities to convey storm water runoff in an efficient, economic, environmentally and aesthetically acceptable manner for the protection of property and life. The City's storm water system serves to convey storm water flow from the built environment to receiving waters in order to protect the life and property of its citizens from potential flooding. The system also serves to convey urban runoff from development such as irrigated landscaped areas, driveways, and streets that flow into drainage facilities and, ultimately, into receiving waters and the ocean. Open facilities, such as channels, can support natural resources including wetland habitat. The long-term performance of the entire system is dependent upon ongoing and proper maintenance of channel sections essential for flood control.

Due to the environmental sensitivity of the natural resources associated with some of the flood control channels, the MMP was developed to ensure that the City complied with various federal, state, and local laws intended to protect and/or minimize impacts to environmental resources (City of San Diego 2011a and b, October 2011). These regulations include, but are not limited to the Clean Water Act (CWA), Endangered Species Act (ESA), California Coastal Act, California Fish and Game Code, California Porter-Cologne Act, California Environmental Quality Act (CEQA), and the San Diego Municipal Code. Additionally, as part of the environmental permitting process, the City works with the public, various stakeholders, non-governmental organizations, and environmental groups in an effort to avoid, minimize, and/or mitigate impacts.

The goal of the MMP is to provide a comprehensive approach to storm water system maintenance. It is intended to achieve the following major objectives:

1. Fulfill the mandate of Section 26.1 of the San Diego City Charter to provide essential public works and public health services by maintaining the storm water conveyance system for the purpose of reducing flood risk;
2. Develop a comprehensive program that will govern the future maintenance of the City's storm water system in an efficient, economic, environmentally and aesthetically acceptable manner for the protection of property and life, in accordance with Council Policy 800-04;

3. Ensure implementation of Best Management Practices (BMPs) and maintenance protocols during maintenance activities to avoid and/or minimize effects to environmental resources, and incorporate the analysis of the operational and pollution prevention benefits of each proposed project; and
4. Create an integrated comprehensive review process for annual maintenance activities that will facilitate operational needs, authorizations from local, state and federal regulatory agencies and include consideration of citizen and other stakeholder interests.

In accordance with these goals and objectives, the Storm Water Division (SWD) prioritizes channel maintenance facilities based upon hydrology, potential risk of flooding, and public input. The SWD conducts appropriate technical analyses required by the MMP's Final Recirculated Programmatic Environmental Impact Report (PEIR) to determine the scope, scale, and environmental impacts of each channel prioritized for maintenance in order to justify the need for maintenance activities and obtain appropriate environmental permits from up to six regulatory agencies. Finally, the SWD implements the planned and emergency channel maintenance activities, ensures permit conditions and mitigation measures are met for each project, and reports annually on channel maintenance and associated compensatory mitigation conducted as part of the MMP.

The remainder of this report discusses the activities implemented by the Storm Water Division over the past year to meet the goals of the MMP. As required by the MMP and PEIR, this summary includes:

- Tabular summary of the biological resources/sensitive vegetation impacted during maintenance and the mitigation;
- Master table containing the following information for each individual storm water facility or segment which is regularly maintained:
 - Date and type of most recent maintenance;
 - Description of mitigation which has occurred; and
 - Description of the status of mitigation which has been implemented for past maintenance activities.
- Results of water quality tests completed before and/or after maintenance;
- Discussion of vegetation growth and sediment accumulation since last maintenance event;
- Estimate of the conveyance capacity resulting from the past year's maintenance.
- Scaled map of each affected storm water facility illustrating pre- and post-maintenance vegetation;

- Summary of the status of mitigation which has been carried out during the current and previous years to mitigate for impacts to upland and wetland vegetation, as well as sensitive species;
- Two digital date-stamped photographs of each of the areas that were maintained in the current year;
- Description of any remedial actions and the outcome of their implementation for each affected storm water facility;
- A list of all storm water facilities anticipated to be maintained in the coming year; and
- A preliminary estimate of sensitive biological and/or cultural resources to be impacted in the coming year with each maintenance activity and mitigation required for anticipated impacts.

The results of this report will be presented as an informational item to the Environment Committee (formerly the Natural Resources and Culture Committee) of the San Diego City Council and the Community Planners Committee and will be provided to the City of San Diego Development Services Department, California Department of Fish and Wildlife, Regional Water Quality Control Board, US Fish and Wildlife Service, and US Army Corps of Engineers. A courtesy copy will also be sent to the County of San Diego.

It should be noted that the MMP identifies a specific planning, impact assessment and mitigation process for channel maintenance activities within portions of the jurisdiction of the City. The channel facilities included in the MMP's certified PEIR includes 113 facility segments, covering a linear distance of 32 miles. 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 (Settlement Agreement), which renders the PEIR document null and void in 2018. Accordingly, the City is currently engaged in a process to identify the components of an integrated Waterways Maintenance Plan (WMP) that will replace the MMP after 2018.

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2 PLANNED CHANNEL MAINTENANCE ACTIVITIES

Under the MMP, the SWD identifies and prioritizes channel maintenance work for the coming year that considers, as a primary objective, each channel segment's ability to meet SWD's flood risk management objectives. A list of priority channels is prepared that also considers environmental resources and mitigation opportunities, relevant water quality regulations and pollutant priorities in each watershed, public input, and budget constraints. Once the priority list has been determined, the City conducts a number of individual technical assessments that analyze potential impacts to biological, cultural, and water quality resources associated with each facility.

First, an Individual Hydraulic and Hydrology Assessment (IHHA) is completed to assess the current channel conveyance capacity, need for maintenance, determine the minimum amount of sediment and/or vegetation that must be removed to improve flood conveyance, and determine if any structures or actions are required to minimize impacts to water quality and/or provide improved erosion control during or after maintenance. When an IHHA is completed for a channel identifying the need for maintenance, an Individual Maintenance Plan (IMP) is developed to document the maintenance area and methods that will be used. Based upon the IMP, technical assessments for biological resources, historical resources, noise, and water quality are completed to determine potential environmental impacts and determine specific mitigation measures to minimize impacts in accordance with the PEIR.

Once these studies are completed, the individual channel projects are permitted through the City of San Diego Substantial Conformance Review (SCR) process as well as through environmental agencies such as the US Army Corps of Engineers, Regional Water Quality Control Board, California Department of Fish and Wildlife, and California Coastal Commission, as appropriate depending on the type of maintenance conducted and the location of the facility.

Channel maintenance activities may commence after all required permits and authorizations are obtained and pre-project permit conditions are met. Channel maintenance is generally restricted by the MMP and various regulatory permits to occur from September through February/March to avoid sensitive bird breeding seasons unless additional biological surveys are conducted and demonstrate no adverse impacts to nesting birds. In addition, wet weather and other factors may limit maintenance activities during the rainy season, typically October through April.

Summary maintenance information, including vegetation impacts and mitigation for channels maintained during the FY 2016 season are presented in Table 1 – MMP Facilities Maintenance and Associated Mitigation Fiscal Year 2017. Figure 1 in Appendix A depicts an overview of the location of these facilities and Figure 2 shows associated mitigation.

**Table 1
MMP Facilities Maintenance and Associated Mitigation Fiscal Year 2017**

Map No.	Facility	Maintenance Date(s)	Maintenance Type	Vegetation Impacts (acres)	Vegetation Type	Mitigation
138 a, b, c, 138, 139	Tijuana River Pilot Channel and Smuggler's Gulch	Sept 2015-ongoing	Sediment and Vegetation Removal	No new impacts. All work occurred within areas previously maintained.		Mitigated with first maintenance event. 1) 9.43 acres at Tijuana River Emergency Channel Maintenance Wetland Mitigation Project (i.e., mitigation for 1993 Pilot Channel Construction) and 2) 8.62 acres of Enhancement within and adjacent to maintenance footprint. No new mitigation proposed.
9, 11, 12	Sorrento Channel, Reaches 3 & 7	11/11/2016-11/18/2016 3/10/2017-3/14/2017	Sediment and Vegetation Removal	No new impacts. All work occurred within areas previously maintained.		Mitigated with first maintenance event. 1) 1.91 acres of Creation at El Cuervo Del Sur Wetlands Mitigation Site and 2) 5.53 acres at Los Peñasquitos Preserve Wetlands Enhancement Site. No new mitigation proposed.

* Impacts contained wholly within existing channel maintenance footprint. No new impacts.

Additional details regarding channels that were maintained during the FY 2017 season are provided in subsequent sections of this report. Appendix A includes location maps for facilities maintained during FY 2017.

A Master Storm Water Facility and Mitigation List reflecting facilities that have been maintained and impacts mitigated under the MMP for which no additional mitigation is required are included in Appendix B.

2.1 TIJUANA RIVER PILOT CHANNEL AND SMUGGLER'S GULCH (MMP MAPS 138 A, B, C, AND 139)

The purpose of periodic maintenance of the Tijuana River Pilot Channel (Pilot Channel) and Smuggler's Gulch (Figures 3 and 4) is to provide flood protection to surrounding properties and to assist in protection of the Tijuana River National Estuarine Research Reserve from impacts due to downstream transport of accumulated sediment, trash, and debris from areas upstream of the project area.

Maintenance was last conducted in the 2015-2016 season and consisted of excavating accumulated vegetation, sediment, and trash that had significantly reduced the capacity of the channels to convey storm flows. The entire channel was not maintained at that time due to inundation of the channel during storms, flows due to unrelated projects upstream, as well as numerous emergency projects that diverted staffing resources and equipment to other locations.

The Pilot Channel was relatively unvegetated with no mature vegetation immediately prior to the continuation of work in FY2017, and Smuggler's Gulch was very sparsely vegetated with herbaceous weeds such as Mexican Tea (*Dysphania ambrosioides*) and wild radish (*Raphanus sativus*). Approximately 5-7 feet of sediment was removed during the 2015-2016 maintenance event and approximately the same amount of sediment had accumulated in the channel prior to the current maintenance period.

During the FY 2017 maintenance period, the full length of Smuggler's Gulch (a historic agricultural ditch) was cleared of vegetation and excavated to its as-built grade. The Pilot Channel was cleared of vegetation and excavated to its as-built grade from the west end of the channel to approximately 1,500 feet west of the confluence with Smuggler's Gulch. The remainder of the Pilot Channel west of Hollister Road was cleared of vegetation and two to three feet of sediment was removed. Maintenance is currently on hold until all nests in the area are no longer active as of the writing of this report. The as-built cross section of the Pilot Channel has a 15 foot bottom width and a 23 foot top width; and the as-built cross section of Smuggler's Gulch has a top and bottom width of 15 feet. Approximately 8,100 linear feet or 4.3 acres of jurisdictional wetlands/waters, consisting of mainly open channel and open water, were

impacted during maintenance activities within the Pilot Channel and Smugglers Gulch. Photographs showing conditions of the channel during maintenance are included in Appendix C. Figures 3 and 4 in Appendix A display pre-maintenance vegetation only, as channel maintenance is still ongoing.

Approximately 22,600 tons of material (i.e., sediment, trash, vegetation, and debris) was excavated from the Smuggler's Gulch and Pilot Channels during the FY2017 maintenance cycle and appropriately disposed of at the Miramar landfill. Some vegetation material remains on site due to a recently noted pest in the Tijuana River Valley– the Polyphagous Shot Hole Borer (PSHB) (*Euwallacea* sp.). In order to minimize the spread of the PSHB and associated fungus, the City's biological consultant has coordinated with Dr. Akif Eskalen of the University of California Riverside (UCR), Department of Plant Pathology and Microbiology and the U.S. Fish and Wildlife Service to implement recommendations to cut and chip dead, infected plant material on site to <1 inch and then solarize under a clear tarp for several weeks to months, depending on season.

Maintenance work was put on hold from December 2016 through March 2017. Due to channel configuration and hydrology, winter storms saturated the channel areas limiting access for heavy equipment used in maintenance. Due to the delay, a request was made to relevant environmental permitting agencies to continue work into the bird breeding season (i.e., past March 15) provided that monitoring protocols are followed to ensure protection of nesting and sensitive birds. Formal regulatory approval and implementation of detailed protocol survey mitigation measures have allowed the City to conduct maintenance activities as-needed and weather permitting throughout the calendar year. However, currently due to the presence of sensitive nests, the environmental permitting agencies required that work be put on hold where it overlaps protective buffers of nests until those nests are no longer active. Currently the nest locations have affected the majority of the project area. The City is pursuing approval for work during the FY 2018 maintenance season via SCR and notifications to the appropriate permitting agencies.

The project was compliant with all environmental permits and no remedial actions were required.

Details on the mitigation efforts for this channel area, which include removal of invasive plant material within the channel footprint and adjacent to the channel, are presented in the Mitigation Projects section of this report.

2.1.1 CONVEYANCE CAPACITY RESULTING FROM MAINTENANCE

The pre-project IHHA results indicated that, in the pre-project condition, the Pilot channel was at approximately 5% of its calculated design capacity and could contain less than a 2-year storm event flow within its banks. With the sediment and vegetation removed, the conveyance capacity of the

Pilot channel would increase from approximately 10 cubic feet per second (cfs) to approximately 200 cfs, although the channel would still contain less than a 2-year storm.

The IHHA results indicated that, in the pre-project condition, Smuggler's Gulch channel was at approximately 73% of its calculated design capacity and could contain the 2-year storm event flow within its banks. With the sediment and vegetation removed, the conveyance capacity of Smuggler's Gulch channel would increase from 800 cfs to 900 cfs and convey the 2-year storm.

2.1.2 WATER QUALITY MONITORING SUMMARY

The IWQA for the project noted that a dry weather diversion structure was installed in March 2009 at the Smuggler's Gulch Channel crossing at the international border. This infrastructure prevents dry weather flows from entering Smuggler's Gulch and essentially eliminates direct dry weather input to the Pilot Channel.

Due to the elimination of dry weather flow, combined with the fact that much of the Smuggler's Gulch is void of vegetation and the Pilot Channel harbors primarily non-native and invasive plant species, there is little potential for water quality impacts from channel maintenance resulting from the loss of pollutant assimilative capacity through vegetation removal. Given the unique conditions, including the intermittent/ephemeral stream flow of the project area, the IWQA employed a modified sampling strategy—sediment characterization. The results of the IWQA showed that there is a pollutant reduction benefit due to sediment removal as part of the project. Even so, the City, in accordance with the SDP and CDP, is implementing a suite of water quality improvement activities including the distribution of pollution prevention outreach materials prior to the start of channel maintenance activities; targeted street sweeping; increased inspections of storm drains within the project's drainage area; and several special studies. Coordination with the Tijuana River Valley Recovery Team is ongoing. It is anticipated that application of these activities within the priority channel drainage areas will lead to long-term water quality benefits.

Additionally, Water Quality Certification No. 09C-077 issued by the Regional Water Quality Control Board required the City to develop and implement a five-year Receiving Waters Monitoring Plan. To comply with this permit condition, water quality samples are collected at three locations upstream and downstream of the maintenance area (as environmental conditions permit) in accordance with the *Tijuana River Receiving Waters Monitoring and Quality Assurance Project Plan* (AMEC, May 2013) at two intervals: pre-maintenance and during maintenance. Water samples will also be collected at the conclusion of maintenance.

In May 2017, water quality samples were collected at the upstream and downstream Pilot Channel locations only, as Smuggler's Gulch was dry throughout each monitoring event. Nutrient concentrations, with the exception of nitrate and nitrite, were many times higher at the upstream

Pilot Channel location. The chloride concentration at the upstream Pilot Channel was almost twice that observed at the downstream Pilot Channel location. Chlorophyll-a was not detected at either station (<8.3 µg/L). The TSS concentration at the upstream Pilot Channel location was slightly more than twice the downstream location. Similar specific conductivity and pH measurements were recorded at both stations. DO was depressed at both Pilot Channel stations. Temperature was 2.7°C lower at the downstream location.

The 2016-2017 monitoring season constituted the fifth and final year of water quality monitoring under Water Quality Certification No. 09C-077. In FY18, a final report will be prepared to provide a comprehensive comparison of all results obtained as part of the five-year monitoring effort and will help identify meaningful trends in water quality over the course of the project.

2.2 [SORRENTO VALLEY CHANNEL MAINTENANCE \(MMP MAPS 9, 11, AND 12\)](#)

The Sorrento Valley Channel Maintenance Project included the mechanized removal of sediment, vegetation, trash and debris in Reach 3 (Soledad Creek Channel) and Reach 7 (Flintkote Channel) which are located near the intersection of Interstate 5 and 805 and through the Roselle Business Park, immediately upstream of State Parks-owned land within Los Peñasquitos Lagoon (Figures 5-10). The maintenance is intended to restore the original conveyance capacity of these channels to provide flood control for the protection of life and property. The maintenance did not include any modification that would change the character, scope, or size of the original channel design, and would not increase the conveyance capacity of the channels beyond their as-built condition. The City obtained all necessary authorization to perform channel maintenance within Reaches 3 and 7 of the Sorrento Valley area and maintenance was performed during two periods in 2016 and 2017. The first maintenance occurred between November 11 and November 18, 2016 for Reach 3 and 7. The second maintenance occurred between March 10 and March 14, 2017 for Reach 7 only.

For Reach 3 (Soledad Creek Channel, MMP Maps 11 & 12), approximately 2,280 linear feet of the channel has been maintained. Jurisdictional impacts within Reach 3 were completed in accordance with the project permits and consisted of removing cleared materials (i.e., sediment and vegetation) from within the concrete channel. Specific habitats affected through sediment and vegetation removal in Reach 3 were: freshwater marsh (0.01 acres) and developed concrete-lined channel (3.28 acres), though it should be noted that work occurred within areas previously maintained and no new impacts occurred. No nesting bird surveys were conducted during the Reach 3 work since its 500 foot buffer did not intersect the MHPA boundary and all work during the effort took place outside of the specified breeding season for raptors and nesting birds (between January 15 and September 15). Photographs showing pre- and post- maintenance conditions of the channel are included in Appendix C. Approximately 395 tons of material (i.e., sediment, trash, vegetation, and debris) was removed during the FY 2017 maintenance period and appropriately disposed of at the Miramar landfill.

For Reach 7 (Flintkote Channel, MMP Map 9), approximately 1,000 linear feet of the channel has been maintained. The only land cover type impacted within the Reach 7 channel was developed concrete-lined channel (0.37 acre). Two periods of maintenance occurred in this section during 2016-2017. The first occurred in November 2016. Due to an unusually large rain event in February, a second maintenance event occurred before March 15th, in accordance with permit requirements. On March 10, 2017, prior to the start of maintenance, the biologist surveyed all suitable habitat within 500 feet of the limits of work for potential nests, including California gnatcatcher nest locations. If any California gnatcatcher nests had been observed, noise monitoring would have been conducted near the nest location to ensure that noise levels did not rise above the ambient 65 dB(a) hourly average at the nest. However, since no nests, nesting behavior, or individual California gnatcatchers were identified during this survey, it was assumed that all suitable habitat within 500 feet of the maintenance area was occupied. Noise monitoring was conducted from the edge of the habitat during all maintenance that occurred within 500 feet in order to ensure that maintenance noise levels did not exceed the ambient hourly average. Please see "Final Monitoring Report for the Soledad Canyon/Sorrento Creek and Flintkote Channel Maintenance Project," (Dudek, 2017) for further detail. Flagging was installed at the eastern end of Reach 7 in order to ensure that no impacts occurred within the environmentally sensitive area (ESA) adjacent to the site. It should be noted that as with Reach 3, all work occurred within areas previously maintained and no new impacts occurred. Photographs showing pre- and post- maintenance conditions of the channel are included in Appendix C. Approximately 77 tons of material (i.e., sediment, trash, vegetation, and debris) was removed during the November 2016 maintenance period and approximately 111 tons of material was removed during the March 2017 maintenance period. All materials were appropriately disposed of at the Miramar landfill.

Maintenance in the Sorrento Valley was last conducted during the FY 2016 period through emergency actions in the transition area between Reach 2-3 to reduce flood risk by removing sediment, debris, and vegetation. Concrete was repaired in Reach 3 to ensure the integrity of the lining during heavy storms. Since the emergency maintenance work, additional sediment accumulated in the channel and vegetation regrowth reduced channel conveyance capacity and necessitated maintenance to reduce flood risk to adjacent property. Maintenance work in Reach 7 was last conducted in FY 2014 with some minor sediment clean up occurring in FY 2015 by hand.

The project was compliant with all environmental permits and no remedial actions were required.

Mitigation has been allocated previously based on the same maintenance impact footprint from Sorrento Valley FY 2011 emergency maintenance event which includes mitigation of the following: 1) 1.91 acres of Creation at El Cuervo Del Sur Wetlands Mitigation Site and 2) 5.53 acres at Los Peñasquitos Preserve Wetlands Enhancement Site as described in the *Final El Cuervo del Sur Wetland Habitat Mitigation and Monitoring Plan* prepared by URS on February 28, 2014 and updated with

assistance from HELIX Environmental Planning on February 25, 2015 and the *Final Los Peñasquitos Canyon Preserve Wetland Enhancement Plan* prepared by URS on February 28, 2014 and updated with assistance from HELIX Environmental Planning on February 25, 2015, respectively. See the Mitigation Projects section for more details.

2.2.1 CONVEYANCE CAPACITY RESULTING FROM MAINTENANCE

The pre-project IHHA results identifies channel capacity by stream reach. Prior to maintenance activities, Soledad Creek/Flintkote Channel (Maps 11-12) was estimated to have a conveyance capacity equal to a 25-year storm event. Under post-maintenance conditions, the channel continues to function with a 25-year storm event capacity. Larger-than-average storm events brought cobble and sediment into the channels which was removed in the November maintenance event.

A second larger-than-average storm event deposited additional sediment and debris. The second maintenance event was conducted in Reach 7, only, to remove sediment and debris from the channel. The pre-project IHHA results indicated that Reach 7, under its pre-project conditions contained the 2-year storm event flows within its banks; however, storm water would back-flow onto Roselle Street through the curb inlets. Maintenance to remove sediment and vegetation within the channel, and downstream outfall of Reach 7, continues to maintain a 2-year storm event.

2.2.2 WATER QUALITY MONITORING SUMMARY

The pre-project IWQA involved assessing water quality and sediment to determine whether the project would impact or benefit water quality. The annual existing pollutant removal load capacity over a three year period was calculated during this assessment and compared to the theoretical maintained pollutant load removal capacity over the same time frame. Factors such as pollution uptake by biomass and pollutant removal resulting from sediment excavation were taken into account, and it was determined that the proposed sediment removal during maintenance would eliminate a larger pollutant load than what is theoretically removed during ambient flow by natural treatment system processes. The study showed that sediment excavation in Reach 3 would prevent re-suspension and downstream transport of sediment-bound pollutants during wet weather, and regrowth of fresh water marsh species in Reach 3 within one year would further enhance dry-season pollutant removal from the channel.

Due to lack of discernible flow during the pre-project IWQA analysis in April 2013, a water quality evaluation for Reach 7 could not be conducted. However, sediment samples were collected and analyzed. The sediment pollutant loading estimates for Reach 7 indicated that the maintenance activities would generate a pollutant reduction benefit through the removal of pollutant-laden sediment. Sediment excavation in Reach 7 is expected to prevent the re-suspension and downstream transport of sediment-bound pollutants during wet weather.

The IWQA results suggest that there is a benefit to the channel maintenance. Post project water quality monitoring was not required for this project and was not conducted. However, the Settlement Agreement provides for specific water quality improvement BMPs to be implemented for channels maintained under the MMP within the SDP framework, regardless of IWQA results. In accordance with the SDP, the City is increasing the frequency of catch basin inspection and as-needed cleaning for one year after maintenance. For every segment that is cleared, the City shall conduct an inspection and cleaning if necessary of every catch basin within 100 feet of the maintained segment, and conduct additional quarterly inspections and as-needed cleaning.

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3 MITIGATION PROJECTS

In accordance with applicable local, state, and federal regulations as well as the PEIR, one-time mitigation is required for significant biological impacts resulting from implementation of the MMP. To mitigate these impacts, the City is planning and implementing mitigation in various watersheds where past, current, or future impacts have or may occur. This section describes projects in various stages of design and implementation, which are depicted in Figure 2 of Appendix A.

3.1 TIJUANA RIVER EMERGENCY CHANNEL MAINTENANCE MITIGATION

The Tijuana River Emergency Channel Maintenance project occurred in the early 1990's and resulted in construction of the Pilot Channel. Mitigation for the Tijuana River Emergency Channel Maintenance occurred in the mid-1990's and consisted of the creation of a 13.21 acre site, 9.43 acres of which was wetlands creation to compensate for the construction of the Pilot Channel. The mitigation was completed in 2001 with sign-off from all applicable environmental regulatory agencies.

On May 24, 2017, Dudek conducted an assessment of the site to verify the mitigation area was still meeting USFWS performance standards. During the site walkthrough, least Bell's vireo (*Vireo belli pusillus*), a federally endangered bird species, were detected vocalizing on site. In addition, a mosaic of native riparian and wetland vegetation communities has been established. While the site exhibits natural changes as dictated by field conditions, the location and composition of vegetation communities is substantially consistent with the project design, and the site remains suitable for supporting the continued utilization by least Bell's vireo (Dudek, June 2017).

3.2 TIJUANA RIVER VALLEY CHANNEL MAINTENANCE MITIGATION PROJECT

In addition to the creation of wetlands described above, wetland enhancement is being conducted as additional mitigation for the continued maintenance in the Pilot Channel and Smuggler's Gulch (MMP Maps 138, 139, 138a, b, and c). The wetland enhancement occurs in two locations per the regulatory permits, Out-of-Channel and In-Channel. The Out-of-Channel mitigation area is adjacent to the channel maintenance areas. The mitigation site is within the Tijuana River Valley Regional Park on City and County of San Diego property.

The 4.31 acre In-Channel mitigation was initiated in September 2013 with the maintenance event which removed non-native vegetation within the channel. Non-native invasive control was also performed through herbicide application to giant reed (*Arundo donax*), castor bean (*Ricinus communis*) and salt cedar (*Tamarix ramosissima*). In FY 2017, channel maintenance helped control the non-natives that had been growing within the channel.

The 4.31 acre Out-of-Channel mitigation was also initiated in September 2013, and involved herbicide treatment and biomass removal of the same three target species. During FY 2017, biomass removal and follow-up herbicide treatment continued as-needed in September, December, February, and April. As of December 2016, the site was in compliance with year 3 standards, with fewer than 50% of initially treated target invasives having resprouts.

The treatment area includes the minimum required 4.31 acres of out-of-channel mitigation, plus an extra 0.43 acres has been treated as a contingency to ensure the mitigation requirements for minimum acreage is met, totaling 4.74 acres. Biomass removal and herbicide treatments will continue in fall 2017.

3.3 LOS PEÑASQUITOS CANYON PRESERVE WETLANDS ENHANCEMENT

The Los Peñasquitos Canyon Preserve Wetland Enhancement Project was designed to remove 8.5 acres of non-native species found within and adjacent to jurisdictional waters in Lopez canyon, as well as support the well-being of native species of plants and animals in order to provide 6.64 acres of mitigation credit. This area was targeted due to its large, contiguous growth of garland daisy which posed a threat to state- and federally-listed willow monardella (*Monardella linoioides*), which is also present in this portion of Lopez Canyon.

Over the past year, significant progress has been achieved, and the project has exceeded all Year 2 standards indicated in the Final Los Peñasquitos Canyon Preserve Wetland Enhancement Plan. Target and non-native species cover is only 1-2 percent cover, less than the 15 percent standard, and native plants are growing within previously cleared areas and increasing in size. Native species cover is 17%, and the Year 2 standard is greater than 15%. During the process of removing the invasives, there were no impacts to the willow monardella or other biologically sensitive species. Reseeding efforts have been successfully conducted in order to revegetate the site with native plant species. The five year maintenance and monitoring period started on June 23, 2015, which marked the completion of the installation phase of the project. Invasive species removal and monitoring will continue at regular intervals.

The project provides wetlands enhancement mitigation for the following channel maintenance locations:

- Sorrento Reaches 3 and 7, MMP Maps 9, 11, 12
- Mission Bay High School and Pacific Beach/Olney Streets, MMP Maps 36, 37
- Tripp and Industrial Court, MMP Maps 6, 6a

3.4 EL CUERVO DEL SUR WETLANDS MITIGATION

This wetland creation project is designed to establish 2.30 acres of wetlands on a currently non-wetland area within the Los Peñasquitos Canyon Preserve as described in the *Final El Cuervo del Sur Conceptual Wetland Habitat Mitigation and Monitoring Plan* dated February 28, 2014 prepared by URS Corporation. The site has been designed in two phases, however, only Phase I is being carried forward to implementation at the present time. This mitigation project is adjacent to previous City mitigation projects (El Cuervo, El Cuervo Norte) along Los Peñasquitos Creek in the Los Peñasquitos Canyon Preserve. The project will involve creation of a depressional wetland area within the floodplain through grading and excavation; planting with a mix of herbaceous wetland, riparian scrub and riparian transitional species; installation of a temporary irrigation system; and a five year maintenance and monitoring period.

The project provides wetlands creation mitigation for the following channel maintenance locations:

- Sorrento and Soledad Creek Reaches 3 and 7, MMP Maps 9, 11, 12
- Mission Bay High School and Pacific Beach/Olney Streets, MMP Maps 36, 37
- Tripp and Industrial Court, MMP Maps 6, 6a

The construction contract was awarded in August 2015. Construction started in late September 2015 at the conclusion of the sensitive bird breeding season. Planting and irrigation installation were completed in the summer of 2017. As of the writing of this report, the site is in its 120 day Plant Establishment Period.

3.5 EL CUERVO WETLANDS MITIGATION

The El Cuervo Wetland Mitigation Project (El Cuervo) was implemented in 2001 to compensate for jurisdictional impacts associated with the initial and future channel maintenance within the Sorrento Creek earthen maintenance area. The El Cuervo site is located within the Los Peñasquitos Canyon Preserve, approximately 1 mile east of the Interstate 5/805 split and north of Sorrento Valley Boulevard. The site is located near the confluence of Lopez Creek and Los Peñasquitos Creek, just east of the historic El Cuervo Adobe.

The mitigation consists of creation/enhancement of 0.64 acre salt marsh habitat at Famosa Slough and creation/enhancement of approximately 12.06 acres riparian habitat as described in the *Summary of the Tenth Year Field Evaluation for the Sorrento Creek Maintenance Dredging Project – Famosa Slough Off-Site Salt Marsh Mitigation Area, San Diego, California*, prepared by Dudek & Associates and dated June 1, 2015. Of this, 9.8 acres was off-site mitigation for the Sorrento Creek project as noted in the *El Cuervo Wetland Area Final Conceptual Wetland Mitigation and Monitoring Plan Los Peñasquitos Canyon Preserve*. Installation of the El Cuervo Wetland mitigation project was

completed on October 4, 2001, at which time the five-year long-term maintenance and monitoring period was initiated. By the end of the fifth year, in October 2006, the project had met its final performance standards, and was subsequently signed-off by permitting regulatory agencies.

3.6 STADIUM (SAN DIEGO RIVER) MITIGATION BANK PURCHASE

The Public Utilities Department's Stadium (San Diego River) Mitigation site is located within the floodplain of the San Diego River between I-15 and I-805. The project site is approximately 57 acres and is currently dominated by a high number of non-native species. The project proposes to restore native habitat to the area by removing non-natives, installing native plants, and maintaining and monitoring the site for a minimum of five years. Site construction began in-December 2016. Non-native vegetation removal is anticipated to be complete by the end of July 2017. Native plant installation is scheduled for July 2017 and the Plant Establishment Period is anticipated to begin in late August 2017.

The Storm Water Division has reserved 8.528 acres of mitigation credits at this site through a Memorandum of Understanding with the Public Utilities Department. The have been used for the following channel maintenance locations:

- Murphy Canyon Channel Maintenance (Map 58)
- Alvarado Creek Channel Maintenance (Maps 59, 60, 64)

3.7 RANCHO JAMUL WETLAND MITIGATION BANK PURCHASE

The Rancho Jamul Wetland Mitigation Bank, located on CDFW lands in unincorporated county lands near Jamul, is proposed to be expanded by approximately 26 acres (Phase IIB) and involves additional stream and wetland re-establishment and enhancement along Jamul Creek and its tributaries. The final permitting and agreements with all regulatory agencies is in progress. The Storm Water Division has purchased 3.3 acres of pre-released wetlands mitigation credits associated with this expansion from the bank sponsor for future projects that occur within the approved service area, consisting of multiple watersheds.

3.8 OTAY REED WETLAND MITIGATION SITE

The Otay Reed Wetland Mitigation Site project consists of implementing wetlands creation, restoration, and enhancement of habitat, involving replacement of eucalyptus woodland and non-native grassland with cismontane alkali marsh, southern willow scrub, and mule fat scrub, located within the Otay watershed along the Otay River. The site will include a total of 5.38 acres of mitigation. This total, will be used to mitigate for impacts related to the proposed routine maintenance within Nestor Creek (MMP Maps 131 and 133) in late 2017.

The Draft Habitat Mitigation and Monitoring Plan is currently under staff review. Final design and CEQA review is scheduled for completion by December 2017, followed by preparation and submittal of required regulatory permit applications before the end of summer 2018.

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4 CONCLUSIONS AND FUTURE PROJECTS

Over the FY 2017 maintenance period, two channels were maintained and over 23,000 tons of trash, sediment, and debris was removed from flood control channels. Over 50 acres of wetlands mitigation has been required and is in various stages of progress to compensate for wetlands impacts associated with channel maintenance related to the MMP. Water quality mitigation is being implemented as required by the SDP and CDP. The maintenance activities conducted under the MMP maintained compliance with all regulatory permits.

For the FY 2018 season, the Storm Water Division is pursuing permits and seeking mitigation to maintain the following facilities:

- Tijuana River Pilot Channel and Smuggler's Gulch MMP Maps 138 a, b, c and 139 (continued maintenance)
- Nestor Creek Channel Maintenance MMP Maps 131 and 133

A preliminary assessment of sensitive biological and cultural resources to be impacted as a result of the anticipated FY 2018 channel maintenance projects is included in Appendix D. The City will continue to implement the MMP by planning channel maintenance and mitigation activities, pursuing environmental permits, conducting appropriate technical assessments, and conducting channel maintenance.

The current MMP and associated authorizations, including the Program Environmental Impact Report (PEIR), will expire in September 2018. To prepare for channel and other drainage facility maintenance authorizations beyond 2018, the City has begun developing a replacement plan, known as the Waterways Maintenance Plan (WMP). The WMP will be part of the storm water division's holistic storm water management strategy with the goal to maintain and restore healthy waterways.

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RICK. 2015e. Summary of Findings for the Annual Drainage Channel Field Assessment and Maintenance Prioritization Project for Chollas Creek Channel Map 71. August 4, 2015.

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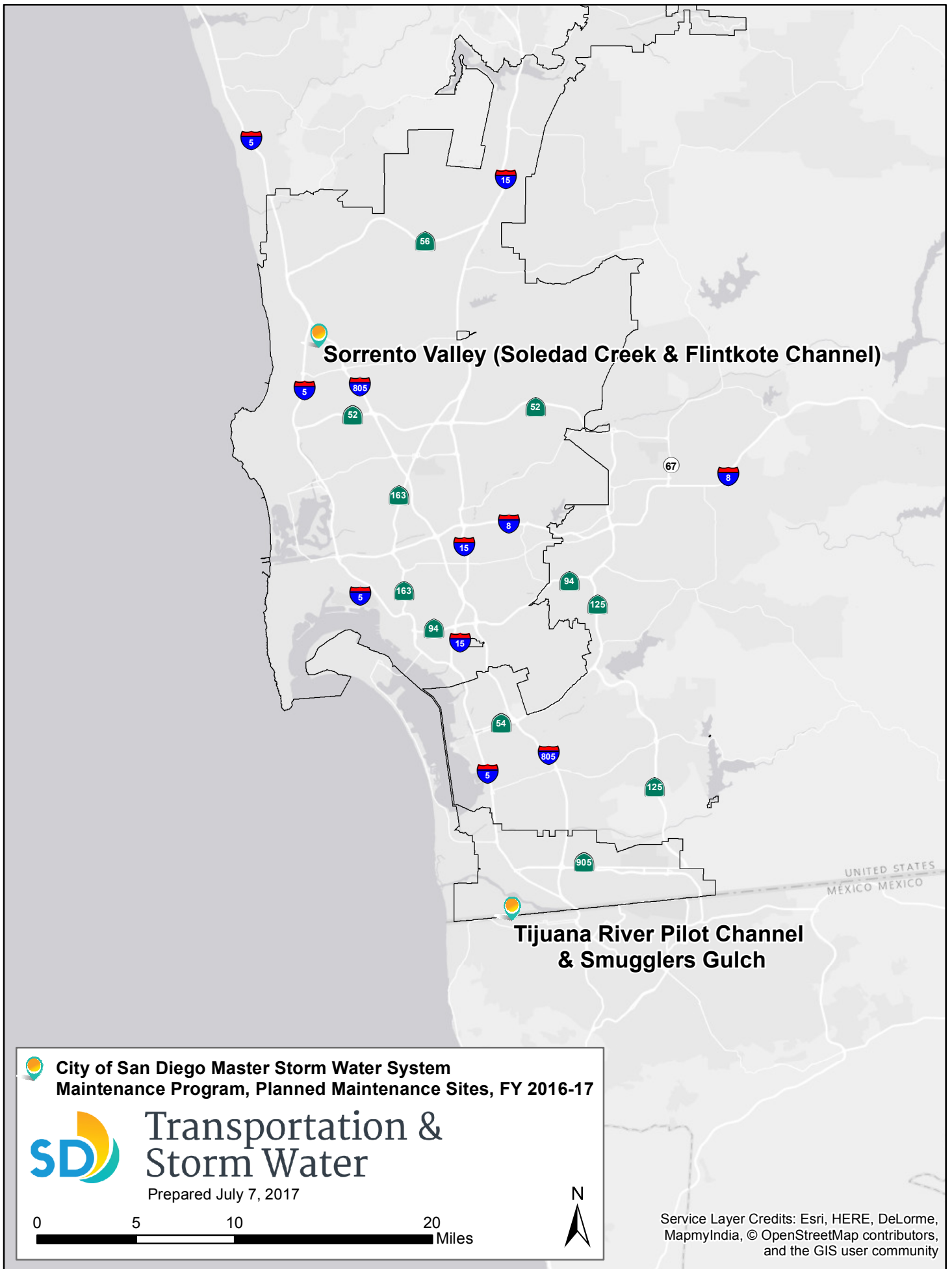
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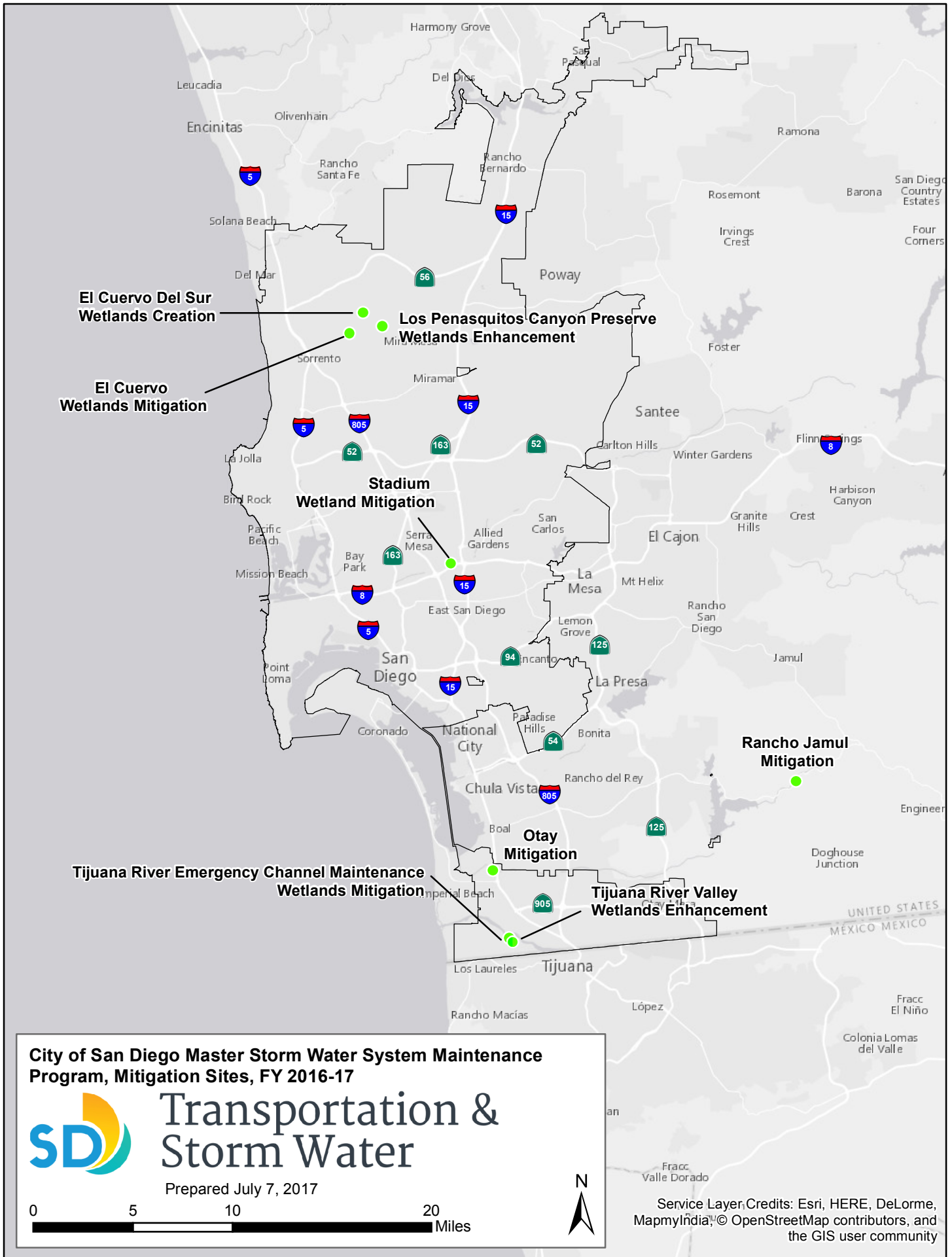
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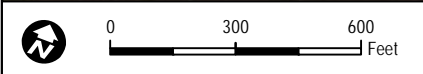
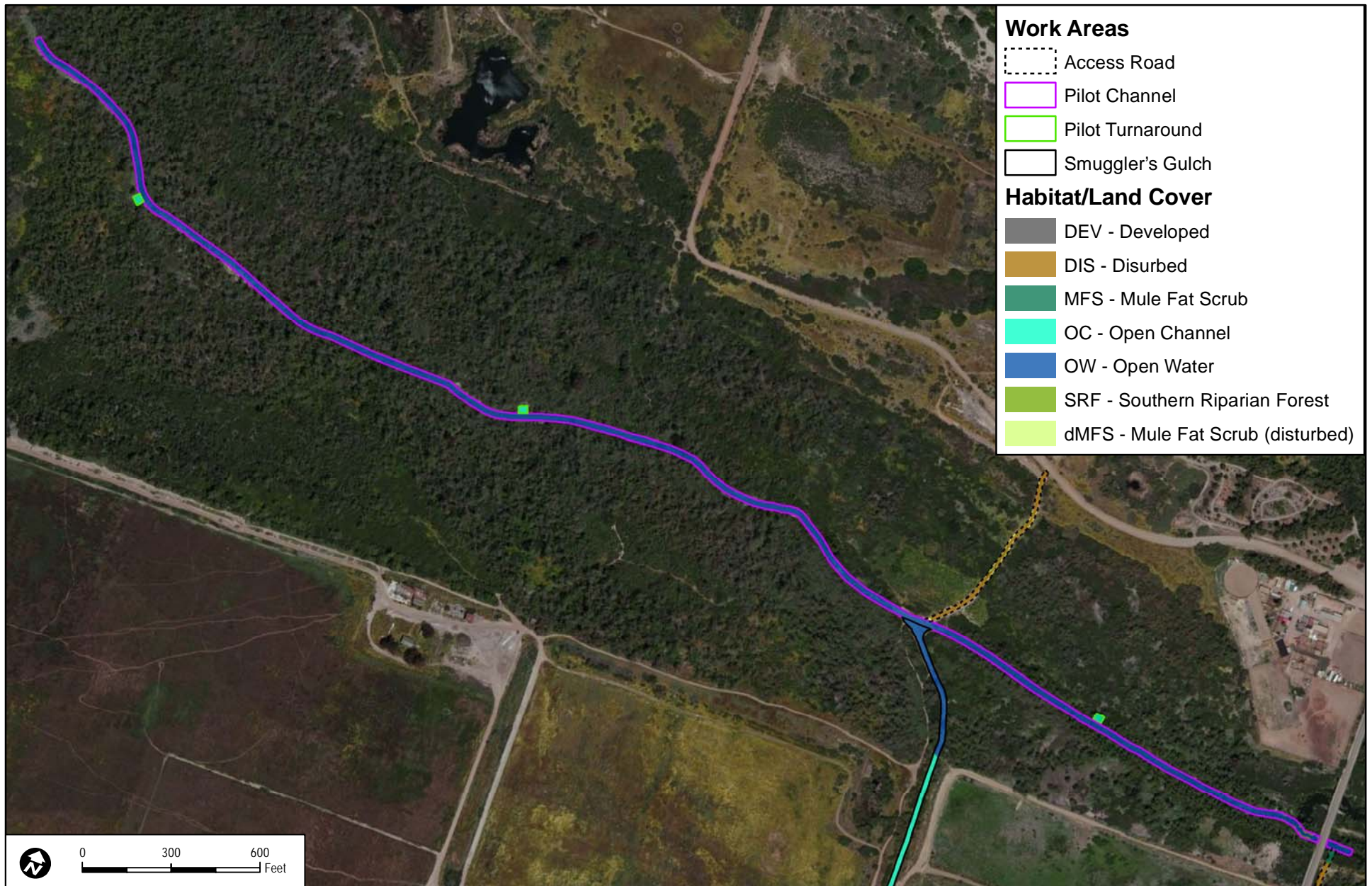
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APPENDIX A

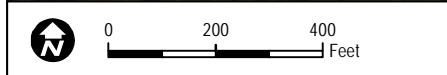
Pre and Post-Maintenance Maps







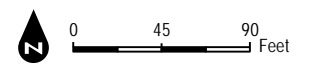
	<p>SOURCE: BING Maps 2015</p> <p style="text-align: right;">Pre-Maintenance Biological Resources</p>
<p>8685</p>	<p>Tijuana River Pilot Channel and Smuggler s Gulch Channel Maintenance Project</p>





	SOURCE: BING 2015	<h3>Pre-Maintenance Biological Resources</h3>
	8685	



- Sorrento Valley Channel - Permitted Work Areas
 - Reach 3 Maintenance Area (MMP Map 11)
 - Reach 3 Maintenance Area (MMP Map 12)
- Work Areas**
- Access/Loading Area
 - Fueling Area
 - Staging Area
 - Vegetation Communities
 - DEV, Developed
 - DEV_CC, Developed (Concrete-Lined Channel)
 - DL, Disturbed Lands
 - FWM, Freshwater Marsh



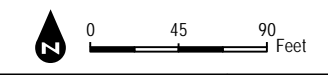



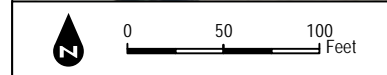
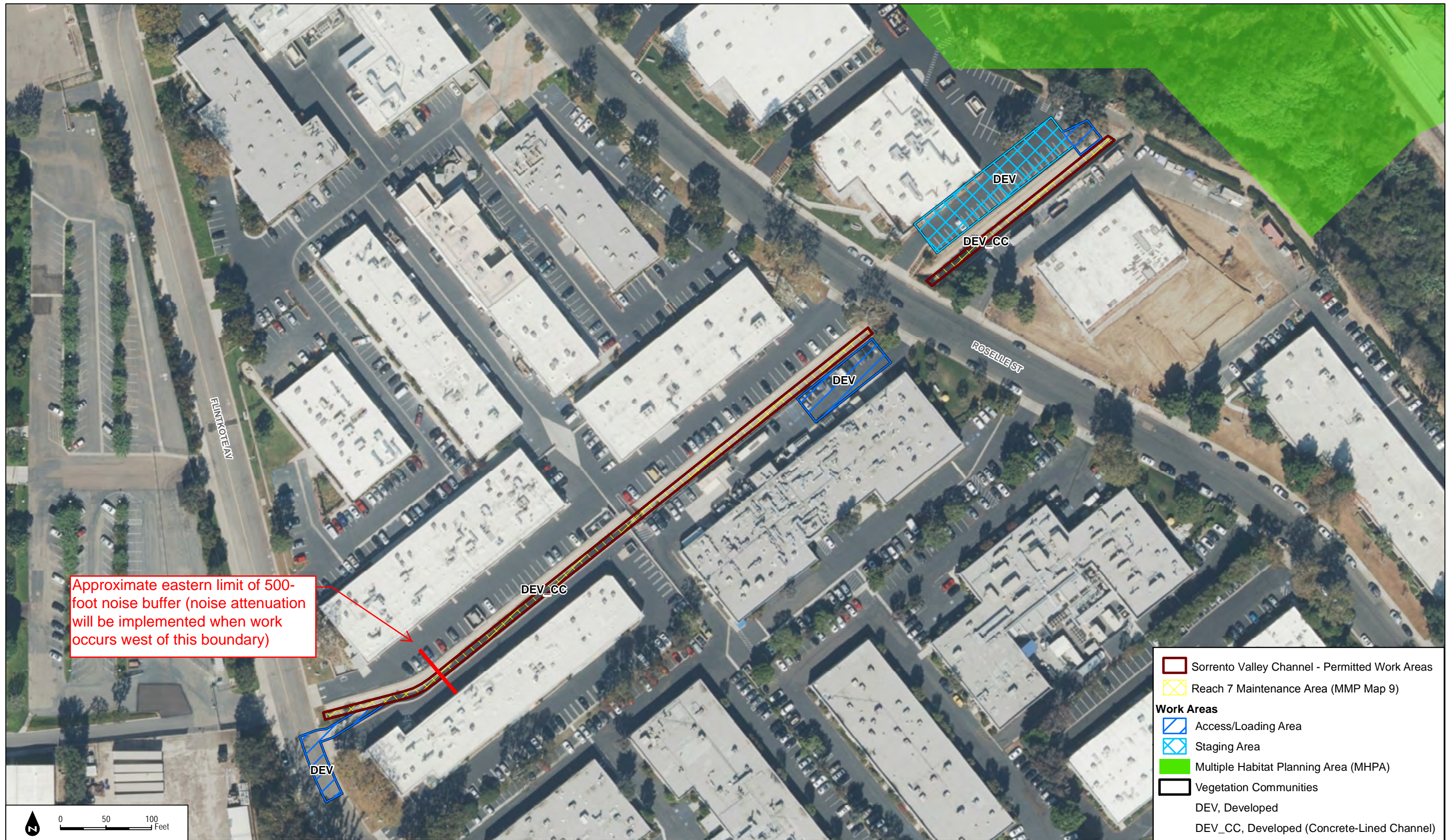
SOURCE: SANDAG Imagery, 2016; URS, 2012
 Sorrento Valley Routine Channel Maintenance Project

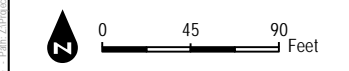
2016-2017 Reach 3 Routine Pre-Maintenance Area Part 1



Sorrento Valley Channel - Permitted Work Areas
 Reach 3 Maintenance Area (MMP Map 12)
Work Areas
 Access/Loading Area
 Fueling Area
 Vegetation Communities
 DEV, Developed
 DEV_CC, Developed (Concrete-Lined Channel)





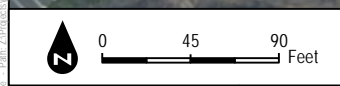


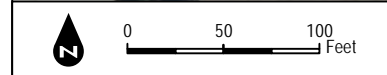
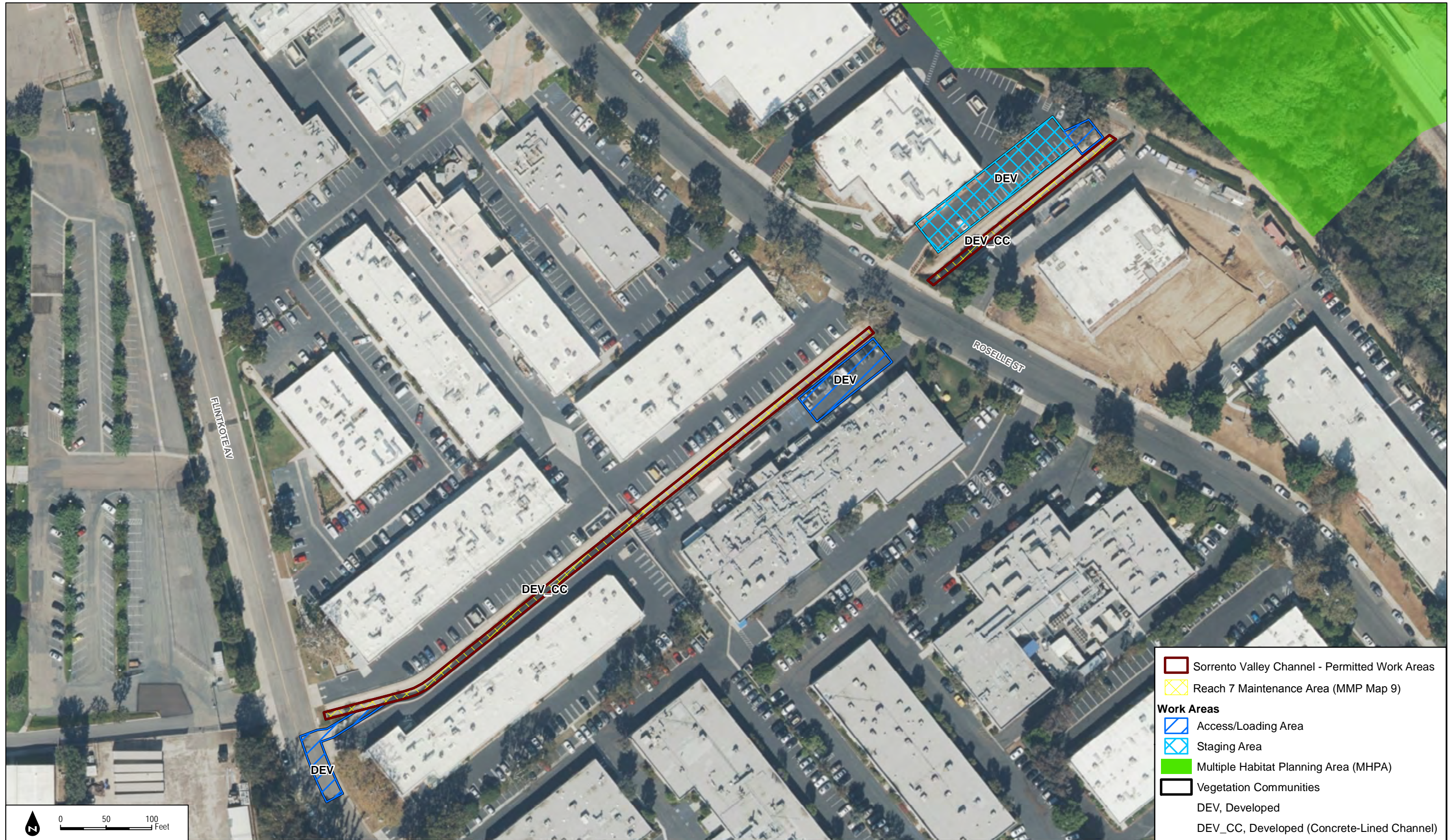
SOURCE: SANDAG Imagery, 2016; URS, 2012
 Sorrento Valley Routine Channel Maintenance Project

2016-2017 Reach 3 Routine Post-Maintenance Area Part 1



- Sorrento Valley Channel - Permitted Work Areas
- Reach 3 Maintenance Area (MMP Map 12)
- Work Areas**
- Access/Loading Area
- Fueling Area
- Vegetation Communities
- DEV, Developed
- DEV_CC, Developed (Concrete-Lined Channel)





SOURCE: SANDAG Imagery, 2016; URS, 2012
 Sorrento Valley Routine Channel Maintenance Project

2016-2017 Reach 7 Routine Post-Maintenance Area

APPENDIX B

Storm Water Facility and Mitigation List

Storm Water Facility and Mitigation List

Map No.	Facility	Date of Most Recent Maintenance	Type of Most Recent Maintenance	Mitigation Site	Mitigation Location	Mitigation Type	Mitigation Acreage	Mitigation Status
138a,b,c, 138, 139	Tijuana River Pilot Channel and Smuggler's Gulch	2016-2017	Planned Maintenance; Vegetation and Sediment Removal	Tijuana River Valley	Adjacent to Site	Wetlands Creation	9.43	Complete in 2001
				Tijuana River Valley	Adjacent to Site	Wetlands Enhancement	8.62	Maintenance and Monitoring Year 3
9, 11, and 12	Sorrento Valley	11/11/2016-3/14/2017	Planned Maintenance; Vegetation and Sediment Removal	El Cuervo Del Sur	Off Site in Watershed	Wetlands Creation	1.91	Construction completed June, 2017. Currently in the 120 PEP
				LPC Preserve Wetlands Enhancement	Off Site in Watershed	Wetlands Enhancement	5.53	Maintenance and Monitoring Year 2
				El Cuervo	Off Site in Watershed	Wetlands Creation	9.8	Complete in 2006
58	Murphy Canyon Creek	2014-2015	Planned Maintenance; Vegetation and Sediment Removal	Stadium Wetland Mitigation Project	Adjacent to Site	Wetlands Restoration	4.28	Credits Reserved
36-37	Mission Bay High School & Pacific Beach Dr/Olney Dr Channels	Spring 2015-Spring 2016	Planned Maintenance; Vegetation and Sediment Removal	El Cuervo Del Sur	Off Site in Watershed	Wetlands Creation	0.34	Construction completed June, 2017. Currently in the 120 PEP
				LPC Preserve Wetlands Enhancement	Off Site in Watershed	Wetlands Enhancement	0.96	Maintenance and Monitoring Year 1
				Marron Valley Cornerstone Mitigation Bank	Offsite	Payment into Marron Valley Cornerstone	0.15	Credits Purchased
54	San Carlos Creek Channel Emergency	Fall 2014	Emergency Maintenance; Debris Removal	TBD	TBD	TBD	TBD	Site suitability search
64a*	Reservoir Drive Channel Emergency	Fall 2014	Emergency Maintenance; Vegetation and Sediment Removal	TBD	TBD	TBD	TBD	Site suitability search
129	Smythe Channel Emergency	Fall 2014	Emergency Maintenance; Vegetation and Sediment Removal	N/A	N/A	N/A	N/A	No mitigation required
59, 60, 64	Alvarado Channel	Fall 2015-ongoing	Planned Maintenance; Sediment and Vegetation Removal	Stadium Wetland Mitigation Project	Off Site in Watershed	Wetlands Restoration	3.55	Credits Reserved
130a*	Via De La Bandola Channel	11/25/2015-12/6/2015	Emergency Maintenance; Debris Removal	TBD	TBD	TBD	0.67	Site suitability search
67-68	Auburn Creek Channel	12/15/2015-1/12/2016	Emergency Maintenance; Vegetation and Sediment Removal	Onsite	Onsite	Onsite restoration	0.09	Complete
70	Auburn Creek Channel	1/28/2016-2/12/2016	Emergency Maintenance; Vegetation and Sediment Removal	TBD	TBD	TBD	0.10	Site suitability search

Map No.	Facility	Date of Most Recent Maintenance	Type of Most Recent Maintenance	Mitigation Site	Mitigation Location	Mitigation Type	Mitigation Acreage	Mitigation Status
77	Auburn Creek Channel	3/4/2016-3/5/2016	Emergency Maintenance; Vegetation and Sediment Removal and Repair to Bank	TBD	TBD	TBD	0.06	Site suitability search
71	Chollas Creek	1/12/2016-4/22/2016	Emergency Maintenance; Vegetation and Sediment Removal	TBD	TBD	TBD	0.04	Site suitability search
91-93	Chollas Creek	12/30/15-01/19/16	Emergency Maintenance; Vegetation and Sediment Removal	TBD	TBD	TBD	2.06	Site suitability search
130	Smythe Channel Emergency	2/3/2016-4/21/2016	Emergency Maintenance; Vegetation and Sediment Removal	Tijuana River Valley Watershed	Offsite in Watershed	Restoration & Enhancement	3.11	Proposed
				Marron Valley Cornerstone Mitigation Bank	Offsite	Payment into Marron Valley Cornerstone	0.015	Credits Purchased
120-121	Cottonwood Channel	12/26/2016-1/1/2016	Emergency Maintenance; Vegetation and Sediment Removal	TBD	TBD	TBD	0.42	Site suitability search
115	Jamacha Channel	1/3/2016-1/3/2016	Emergency Maintenance; Vegetation and Sediment Removal	TBD	TBD	TBD	0.12	Site suitability search
134	Nestor Creek Channel	02/05/16-02-06-16	Emergency Maintenance; Vegetation and Sediment Removal	Otay River Wetland Mitigation Site	Offsite in Watershed	Wetlands Restoration	0.02	Design
122	Parkside Channel	12/23/2015-12/26/2015	Emergency Maintenance; Vegetation and Sediment Removal	TBD	TBD	TBD	0.2	Site suitability search
84	Washington Channel	1/20/2016-1/30/2016	Emergency Maintenance; Vegetation and Sediment Removal	TBD	TBD	TBD	0.08	Site suitability search
Total Acres							50.715	

* Amendment to add this map to MMP in process

APPENDIX C

MMP Photos

PRE-AND POST-MAINTENANCE PHOTOGRAPHS (MMP)



Photo 1. Tijuana River Valley Channel Maintenance Project, during maintenance, 11/15/16



Photo 2. Tijuana River Valley Channel Maintenance Project, during maintenance, 11/20/16



Photo 3. Sorrento Valley Reach 3 (Soledad Creek Channel) (MMP Map 11&12) Maintenance Project,
Pre-maintenance, 11/11/2016



Photo 4. Sorrento Valley Reach 3 (Soledad Creek Channel) (MMP Map 11&12) Maintenance Project,
Post-maintenance, 11/13/2016



Photo 5. Sorrento Valley Reach 7 (Flintkote Channel) (MMP Map 9) Maintenance Project,
Pre-maintenance, 11/15/2016



Photo 6. Sorrento Valley Reach 7 (Flintkote Channel) (MMP Map 9) Maintenance Project,
Post-maintenance, 3/14/2017

APPENDIX D

List of Anticipated Biological and Cultural Resources to be Impacted

Biological

Map No.	Facility	Proposed Maintenance Type	Vegetation Impacts (acres)		Mitigation
138 a, b, c, 138, 139	Tijuana River Pilot Channel and Smuggler's Gulch	Continuation of Sediment and Vegetation Removal	No additional impacts		Mitigated with first maintenance event. 1) 9.43 acres at Tijuana River Emergency Channel Maintenance Wetland Mitigation Project (i.e. mitigation for 1993 Pilot Channel Construction) and 2) 8.62 acres of Enhancement within and adjacent to maintenance footprint. No new mitigation proposed.
131 & 133	Nestor	Routine	0.86	Southern Willow Scrub	4.94 acres will be assigned at the Otay Reed Wetland Mitigation Site with a combination of wetlands creation, restoration, and enhancement.
			0.46	Freshwater Marsh	
			0.10	Disturbed Wetland	
			0.10	Disturbed Wetland (Arundo-dominated)	
			0.06	Natural Flood Channel/Streambed	
			0.02	Disturbed Diegan Coastal Sage Scrub	0.44 acre purchase of upland credits at Marron Valley
			0.84	Non-native Grasslands	

MMP Total New Vegetation Impacts (acres)	2.44	Total New Mitigation (acres): 5.40
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Cultural

Map No.	Facility	Proposed Maintenance Type	Cultural Resources Impacts
138 a, b, c, 138, 139	Tijuana River Pilot Channel and Smuggler's Gulch	Sediment and Vegetation Removal	None
131 & 133	Nestor	Routine	None