

**APPENDIX A**  
**WATERSHED WATER QUALITY AND EDUCATION**  
**ACTIVITY SUMMARY SHEETS**

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**TITLE: I LOVE A CLEAN SAN DIEGO TRASH SPONSORSHIP**  
**ID #: MB-1002**

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### **ACTIVITY IMPLEMENTATION**

Each spring, I Love A Clean San Diego (ILACSD) conducts its Creek to Bay Cleanup event to target various inland and coastal sites in San Diego County in need of trash and debris removal. ILACSD recruits and organizes site captains and groups of volunteers for each site. A media center is also designated, which promotes environmental stewardship, including the importance of keeping litter and debris from spoiling the region's watersheds. The whole event is marketed throughout San Diego County through a variety of media, including television, radio public service announcements, newspapers, newsletters, electronic mail, bulletin boards, community outreach activities, calendar listings, and word of mouth.

The ILACSD Creek to Bay Cleanup occurred on April 30, 2011. The City of San Diego (City) sponsored the Marian Bear Memorial Park site in the Mission Bay and La Jolla Watershed Management Area (WMA). Approximately 48 volunteers removed 350 pounds of trash and debris and recycled 25 pounds of trash and debris in a one mile area.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Indicator Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

The Creek to Bay Cleanup has historically been held in April of each year. Prior to the event, the City coordinates with ILACSD staff to ensure that a site within the Mission Bay/La Jolla WMA is included in the list for cleanups.

### **LEAD WATERSHED COPERMITTEE**

- City of City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- I Love A Clean San Diego Volunteers from the general public

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Trash

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay and La Jolla WMA identify bacteria as a high priority water quality problem throughout the WMA, and recommend implementing load reduction/source abatement activities to address it.

## **EFFECTIVENESS MEASUREMENTS**

### **Management Questions**

- 1) What is the load reduction associated with sponsorship?
- 2) What is the efficiency of the trash cleanup? (\$/pound collected)

### **Targeted Measurable Outcome(s)**

- 1) Achieve load reduction due to reduction of trash (any amount) due to trash cleanup sponsorship

### **Assessment Method(s)**

- 1) Tabulation (e.g., number of participants)
- 2) Quantification (e.g., pounds of trash collected)

### **Data Recorded**

- 1) Pounds of trash removed (Outcome Level 4): 350 lbs
- 2) Pounds of trash recycled (Outcome Level 4): 25 lbs
- 3) Total pounds of trash removed and recycled (Outcome Level 4): 375 lbs
- 4) Number of participants (Outcome Level 1): 48
- 5) Amount of money spent on cleanups for all six watersheds (Outcome Level 1): \$30,000
- 6) Estimated amount of money spent on cleanups for the Mission Bay/La Jolla watershed (Outcome Level 1): \$5,000
- 7) Efficiency (Total Cost/Total Pounds Removed): \$13.33/lb

## **EXPECTED BENEFITS**

Sponsorship of the Creek to Bay Cleanup will result in load reduction of trash and debris directly and of bacteria indirectly.

## **ANALYSIS RESULTS**

At the event, 48 participants removed 350 pounds of trash and debris and recycled 25 pounds of trash and debris. The average estimated sponsorship cost was \$5,000 per watershed; thus, there was a 375 pound load reduction and an efficiency of \$13.33 per pound collected. The efficiency was calculated by dividing the sponsorship cost for the Mission Bay and La Jolla WMA by the total pounds of trash removed and recycled.

## **CONCLUSIONS**

This trash cleanup activity fulfills a watershed water quality activity for FY2011 because this activity resulted in a measurable pollutant load reduction (Outcome Level 4) of 375 pounds of trash removed and recycled during the reporting period. Implementation and assessment of load reduction and efficiency for the cleanup sponsorship will occur again in FY 2012.

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**TITLE: COASTAL CLEANUP DAY SPONSORSHIP**  
**ID #: MB-1003**

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### **ACTIVITY IMPLEMENTATION**

Each fall, San Diego Coastkeeper (SDCK) and I Love A Clean San Diego (ILACSD) conduct the Coastal Cleanup Day event to target various inland and coastal sites in San Diego County in need of trash and debris removal. They recruited and organized site captains and groups of volunteers for each site. A media center is also designated, which promotes environmental stewardship, including the importance of keeping litter and debris from spoiling the region's watersheds. The whole event is marketed throughout San Diego County through a variety of media, including television, radio public service announcements, newspapers, newsletters, electronic mail, bulletin boards, community outreach activities, calendar listings, and word of mouth.

Coastal Cleanup Day occurred on September 25, 2010. The City of San Diego (City) sponsored the Rose Creek Corridor, Pacific Beach site in the Mission Bay and La Jolla Watershed Management Area (WMA). Approximately 619 volunteers removed 2,364 pounds of trash and debris and recycled 334 pounds of trash and debris.

### **TMDL APPLICABILITY**

- Indicator Bacteria - Beaches and Creeks SD Region

### **TIME SCHEDULE FOR IMPLEMENTATION**

Coastal Cleanup Day has historically been held in September of each year. Prior to that month, the City coordinates with SDCK and ILACSD staff to ensure that sites within the Mission Bay and La Jolla WMA are included in the list of cleanups.

### **LEAD WATERSHED COPERMITTEE**

- City of City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- I Love A Clean San Diego
- San Diego Coastkeeper
- Volunteers from the general public

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Trash

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay and La Jolla WMA identify bacteria as a high priority

water quality problem throughout the WMA, and recommend implementing load reduction/source abatement activities to address it.

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Questions**

- 1) What is the load reduction associated with sponsorship?
- 2) What is the efficiency of the trash cleanup? (\$/pound collected)

#### **Targeted Measurable Outcome(s)**

- 1) Achieve load reduction due to reduction of trash (any amount) due to trash cleanup sponsorship

#### **Assessment Method(s)**

- 1) Tabulation (e.g., number of participants)
- 2) Quantification (e.g., pounds of trash collected)

#### **Data Recorded**

- 1) Pounds of trash removed (Outcome Level 4): 2,364 lbs
- 2) Pounds of trash recycled (Outcome Level 4): 334 lbs
- 3) Total pounds of trash removed and recycled (Outcome Level 4): 2,698 lbs
- 4) Number of participants (Outcome Level 1): 619
- 5) Amount of money spent on cleanups for all six watersheds (Outcome Level 1): \$30,000
- 6) Estimated amount of money spent on cleanups for the Mission Bay/La Jolla watershed (Outcome Level 1): \$5,000
- 7) Efficiency (Total Cost/Total Pounds Removed): \$1.85/lb

### **EXPECTED BENEFITS**

Sponsorship of Coastal Cleanup Day will result in load reduction of trash and debris directly and of bacteria indirectly.

### **ANALYSIS RESULTS**

At the event, 619 participants removed 2,364 pounds of trash and debris and recycled 334 pounds of trash and debris, which was tracked using data cards provided by the Ocean Conservancy. The average estimated sponsorship cost was \$5,000 per watershed; thus, there was a 2,698 pound load reduction and an efficiency of \$1.85 per pound collected. The efficiency was calculated by dividing the sponsorship cost for the Mission Bay and La Jolla WMA by the total pounds of trash removed and recycled.

### **CONCLUSIONS**

This trash cleanup activity fulfills a watershed water quality activity for FY2011 because this activity resulted in a measurable pollutant load reduction (Outcome Level 4) of 2,698 pounds of trash removed and recycled during the reporting period. Implementation and assessment of load reduction and efficiency for the cleanup sponsorship will occur again in FY 2012.

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**TITLE: OSLER STREET HYDRODYNAMIC SEPARATOR  
INSTALLATION PROJECT  
ID #: MB-1012**

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### **ACTIVITY IMPLEMENTATION**

Osler Street is located on the Northern end of Linda Vista Park in the Mission Bay and La Jolla Watershed Management Area (WMA). The City of San Diego (City) planned to install hydrodynamic separator directly in line with a 24-inch storm drain that traverses the park and discharges into Tecolote Canyon. The hydrodynamic separator would have been used to reduce the amount of trash, sediment, oils and grease that makes its way into the storm drain system.

Upon further review, this project was found to be redundant and has been cancelled. The City did not need another pilot project involving a hydrodynamic separator. Additionally, the expected load reduction was not worth the difficulty of construction at this site.

### **TIME SCHEDULE FOR IMPLEMENTATION**

The project was transferred to the Preliminary Engineering section of the Engineering and Capital Projects Department in September 2008 for the purpose of managing the project through final design, construction and project closeout. Design began February 2010. This project was cancelled in FY2011.

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**TITLE: LA JOLLA SHORES ASBS POLLUTION CONTROL PROGRAM  
(AKA LOW FLOW DIVERSIONS PHASE IV)**  
**ID #: MB-1013**

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### **ACTIVITY IMPLEMENTATION**

The City of San Diego (City) has been installing a low flow storm drain diversion system in phases to serve the Pacific Ocean coast of the La Jolla, Pacific Beach, and Ocean Beach areas. Phases I, II, and III have been completed using grant monies from the Environmental Protection Agency.

Phase IV focuses on the La Jolla Area of Special Biological Significance (ASBS) to address the prohibition of dry weather flows under the Ocean Plan Exception Process. Four low flow coastal diversions are planned for this fourth phase: Camino del Oro (Camino del Oro near El Paseo Grande), 7920 Princess St. (Torrey Pines Rd. and Princess St.), Torrey Pines Rd. and Charlotte St. (Torrey Pines and Amalfi), and 1624 Torrey Pines Rd. (Torrey Pines and Coast Walk). The City held a workshop to present the concept for these sites on July 30, 2008 and invited the La Jolla Town Council, the La Jolla Community Planning Group, the La Jolla Shores Association, San Diego Coastkeeper, and the general public.

The UC Regents - UCSD applied to the State Board for an implementation grant under this Consolidated Grant program (Proposition 50) for multiple structural control projects consistent with the La Jolla Shores Integrated Coastal Watershed Management Plan (ICWMP) (see activity summary sheet MB-3003 La Jolla Shores Integrated Coastal Watershed Management Plan) including these low flow diversions. City staff coordinated with UC Regents-UCSD for the City to be a subcontractor on this grant for the implementation of the low flow diversions. Design was completed in November 2009. The project began the process for advertising for construction bids in June 2010. Unfortunately, all the bidders were disqualified. Re-advertisement will commence in Winter 2011 when the new grant funding is available in the project. It is anticipated that construction will be completed in FY12.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creek Bacteria TMDL
- Area of Special Biological Significance Nos. 29 and 31

### **TIME SCHEDULE FOR IMPLEMENTATION**

Design was completed in November 2009. The project began the process for advertising for construction bids in June 2010. Unfortunately, all the bidders were disqualified. Re-advertisement will commence in Winter 2011 when the new grant funding is available in the project. It is anticipated that construction will be completed in FY12.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A



**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Sediment

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area (WMA) and the City's *Strategic Plan for Watershed Activity Implementation* identify bacteria, heavy metals and nutrients as high priority water quality problems in the WMA, and recommend implementing load reduction/source abatement activities to address them. Installation of dry weather flow diversions will reduce loading of pollutants through runoff capture and treatment.

**EFFECTIVENESS MEASUREMENTS****Management Questions**

- 1) What is the load reduction efficiency of the flow diversions?
- 2) How effective are these diversions at reducing loads of priority pollutants?

**Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

**Assessment Method(s)**

- 1) Inspections (e.g., ensure the system upgrades are working as designed)
- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)
- 4) Tabulation (e.g., amount of money spent on implementation and maintenance)
- 5) Reporting (e.g., estimates of load reduction from 3rd party data)

**Data Recorded**

N/A

**EXPECTED BENEFITS**

The goal of this assessment is to determine the effectiveness and efficiency of installing low flow diversions to divert dry weather runoff into the sewer system for treatment instead of low flows discharging out of storm drain outfalls directly into the ASBS. Targeted high priority pollutants include bacteria, metals and nutrients.

**ANALYSIS RESULTS**

Assessment is not possible at this time, as the diversions have not yet been constructed. Prior to construction, monitoring will be conducted to determine baseline conditions. Post-construction monitoring will be conducted as well for comparison to baseline conditions and assessment of effectiveness.

## **CONCLUSIONS**

Design was completed in FY11. Construction is expected to begin in FY 2011 and finish in FY2012. Once construction and assessment are both complete, conclusions will be made as to the effectiveness and efficiency of the project.

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**TITLE: KELLOGG PARK GREEN LOT RETROFIT PROJECT**  
**ID #: MB-1014**

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### **ACTIVITY IMPLEMENTATION**

This project will replace a portion of the conventional asphalt of the Kellogg Park parking lot with porous pavers to allow for the infiltration of urban runoff. Originally the project considered only the western half of the parking lot. In late FY 2008, the project was expanded to include the entire parking lot. The concept design for the western half of the parking lot was worked on in FY 2008. An additional conceptual design, showing pervious pavers installed in the north and south ends of the lot, was completed in FY 2009. The middle of the lot will be resurfaced with conventional asphalt. The pollutant load reduction resulting from this activity will contribute to meeting requirements under the Municipal Permit, Area of Special Biological Significance (ASBS), and current and anticipated Total Maximum Daily Loads (TMDLs) in the receiving waters of the Mission Bay and La Jolla Watershed Management Area (WMA).

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL
- Area of Special Biological Significance Nos. 29 and 31

### **TIME SCHEDULE FOR IMPLEMENTATION**

Design for this project was initiated in January 2009. Design was completed in February 2010. The process of advertising the project for construction began in March 2010 and the project was awarded to a contractor in March 2011. Construction began in FY11 and will continue into FY12. Water quality monitoring will be conducted before and after construction to assess the effectiveness in reducing runoff volume and pollutant loading.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Sediment

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla WMA and the City's *Strategic Plan for Watershed Activity Implementation* identify bacteria, heavy metals and nutrients as high priority water quality problems, and recommend implementing load reduction/source abatement activities to address them. Implementation of this activity will address the high priority water quality problems by reducing and treating runoff volume of pollutants via infiltration and retention.

## **EFFECTIVENESS MEASUREMENTS**

### **Management Questions**

- 1) What is the load reduction efficiency of retrofits?
- 2) How effective are retrofits at reducing loads of priority pollutants (metals and bacteria)?

### **Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

### **Assessment Method(s)**

- 1) Inspections (e.g., ensure the retrofit is working as designed)
- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)
- 4) Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials)
- 5) Reporting (e.g., estimates of load reduction from 3rd party data)

### **Data Recorded**

N/A

## **EXPECTED BENEFITS**

The goal of the project is to reduce runoff volume through infiltration. The goal of this analysis is to determine the load reduction efficiency of Low Impact Development (LID) Best Management Practice (BMP) retrofits through reduction of runoff volume. The load reduction efficiencies will also be estimated and used to determine the efficacy of future LID BMP implementations of similar type. High priority pollutants targeted include bacteria, nutrients and heavy metals.

## **ANALYSIS RESULTS**

The concept design for this project began in FY 2008 and baseline monitoring was completed. Currently, load estimates are being calculated and will be included in the project report. Once design and construction are complete, additional assessment will be completed to determine the effectiveness of this activity.

## **CONCLUSIONS**

As mentioned above, the assessment will be completed after project construction and conclusions will be made at that time. The pollutant load reduction resulting from this activity will contribute to meeting requirements under the Municipal Permit, ASBS, and current and anticipated TMDLs in the receiving waters of the Mission Bay and La Jolla WMA.

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**TITLE: MT ABERNATHY GREEN STREET RETROFIT**  
**ID #: MB-1015**

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### **ACTIVITY IMPLEMENTATION**

This activity will involve the implementation of an infiltration project in the Mission Bay and La Jolla Watershed Management Area (WMA) to reduce runoff volume. The activity will be implemented in a residential right of way (“Green Street”). Exact location and type has been based on monitoring and geotechnical considerations, proximity to other best management practices (BMPs) being implemented, site availability, land use, etc. The pollutant load reduction resulting from this activity will contribute to meeting requirements under the Municipal Permit and current and anticipated Total Maximum Daily Loads (TMDLs) in the receiving waters of the Mission Bay and La Jolla WMA.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL
- Tecolote Creek Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Project planning began in July 2007, but the project was almost immediately put on hold because staff time and resources were allocated to other high-priority projects and significant activities as outlined in the City’s *Strategic Plan for Watershed Activity Implementation*. This project is working on 100% Design plans. Construction is expected to begin in FY 2012.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Metals
- Nutrients

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area (WMA) as well as the City’s *Strategic Plan for Watershed Activity Implementation* identify bacteria as a high priority water quality problem, and recommend implementing load reduction/source abatement activities to address it. Implementation of this activity will address the high priority water quality problems by reducing and treating runoff volume of pollutants via infiltration and treatment.

## **EFFECTIVENESS MEASUREMENTS**

### **Management Questions**

- 1) What is the bacteria load reduction efficiency?
- 2) How effective are the catch basin, storm drain and trash segregation unit installations at reducing loads of priority pollutants?

### **Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

### **Assessment Method(s)**

- 1) Inspections (e.g., ensure the treatment is working as designed)
- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)
- 4) Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials)
- 5) Reporting (e.g., estimates of load reduction from 3rd party data)

### **Data Recorded**

N/A

## **EXPECTED BENEFITS**

The goal of this assessment is to determine the project's effectiveness and efficiency for reducing bacteria, metals, and nutrient loads with the installation of various vegetative planters in the Mt Abernathy neighborhood.

## **ANALYSIS RESULTS**

This project is still in the design phase and has not been implemented; therefore, effectiveness assessment has not been completed at this time. Assessment will be conducted after project completion.

## **CONCLUSIONS**

Water quality monitoring will be conducted after construction to assess the effectiveness in reducing runoff volume and pollutant loading in order to determine pollutant load reduction and to make conclusions on the effectiveness of this type of project.

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**TITLE:                   BANNOCK AVENUE STREETScape ENHANCEMENT &  
BACTERIA TREATMENT PROJECT**  
**ID #:                    MB-1016**

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### **ACTIVITY IMPLEMENTATION**

Within the tributary watershed of the Bannock Avenue Neighborhood, vegetated planter areas will be constructed between the existing curb and the sidewalk. Cuts will be made in the existing curbs to allow flow to exit the street paved section as well as enter and exit the planter areas. The planter areas will be filled with cobbles and/or gravel to a depth of approximately 1 foot and planted with landscaping to be determined during final design. The cobbles and/or gravel must be placed to an elevation approximately 1 inch below the adjacent sidewalk and curb to ensure no Americans with Disabilities Act (ADA) access issues are encountered. The cobbles and/or gravel will be prevented from spilling into the street through the curb cut by a metal screen.. The need for temporary or permanent irrigation to establish the planter areas must be determined during final design.

Within North Clairemont Park, a diversion structure was proposed to divert flows to a trash segregation unit, followed in series by a bacteria treatment system. From this system, flows would have been returned to the natural drainage course at the location of the existing storm drain system outlet headwall. Upon further review, the bacteria treatment system was eliminated from the project. A literature review did not indicate that the proposed system would provide any additional treatment.

This project was identified as “Infiltration BMP Retrofit #1” in the 2008 Mission Bay and La Jolla WURMP. In the latter half of FY 2008, a site was selected and conceptual design was completed.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

The project was transferred to the Preliminary Engineering section of the City’s Engineering and Capital Projects Department in September 2008 for the purpose of managing the project through final design, construction and project closeout. The project completed preliminary engineering and transferred to design in February 2010. Design began in FY2011 and will continue in FY2013. Construction is anticipated to be completed in FY 2014.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Sediment
- Trash

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area (WMA) as well as the City's of *San Diego Strategic Plan for Watershed Activity Implementation* identify bacteria as a high priority water quality problem, and recommend implementing load reduction/source abatement activities to address it. Implementation of this activity will address the high priority water quality problems by reducing and treating runoff volume of pollutants via infiltration and treatment.

**EFFECTIVENESS MEASUREMENTS****Management Questions**

- 1) What is the bacteria load reduction efficiency?
- 2) How effective are the catch basin, storm drain and trash segregation unit installations at reducing loads of priority pollutants?

**Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

**Assessment Method(s)**

- 1) Inspections (e.g., ensure the treatment is working as designed)
- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)
- 4) Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials)
- 5) Reporting (e.g., estimates of load reduction from 3rd party data)

**Data Recorded**

N/A

**EXPECTED BENEFITS**

The goal of this assessment is to determine the project effectiveness and efficiency for reducing bacteria load with the installation of vegetative planters, and trash segregation units in the Bannock Avenue Neighborhood.

**ANALYSIS RESULTS**

This project is still in the design phase and has not been implemented; therefore, effectiveness assessment has not been completed at this time. Assessment will be conducted after project completion.

**CONCLUSIONS**

Water quality monitoring will be conducted after construction to assess the effectiveness in reducing runoff volume and pollutant loading in order to determine pollutant load reduction and to make conclusions on the effectiveness of this type of project.



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**TITLE: INFILTRATION BMP RETROFIT #2**  
**ID #: MB-1017**

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### **ACTIVITY IMPLEMENTATION**

This activity will involve the implementation of an infiltration project in the Mission Bay and La Jolla Watershed Management Area (WMA) to reduce runoff volume. The activity will be implemented in a residential right of way (“Green Street”). Exact location and type will be based on monitoring and geotechnical considerations, proximity to other best management practices (BMPs) being implemented, site availability, land use, etc. The pollutant load reduction resulting from this activity will contribute to meeting requirements under the Municipal Permit and current and anticipated Total Maximum Daily Loads (TMDLs) in the receiving waters of the Mission Bay and La Jolla WMA.

The project did not advance in FY 2011. It is currently on hold due to limited resources that have been allocated to other watershed activities which are moving forward.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL
- Tecolote Creek Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Project planning began in July 2007, but the project was almost immediately put on hold because staff time and resources were allocated to other high-priority projects and significant activities as outlined in the City’s *Strategic Plan for Watershed Activity Implementation*. This project is on hold.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Metals
- Nutrients

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area (WMA) as well as the City’s *Strategic Plan for Watershed Activity Implementation* identify bacteria as a high priority water quality problem, and recommend implementing load reduction/source abatement activities to address it. Implementation of this

activity will address the high priority water quality problems by reducing and treating runoff volume of pollutants via infiltration and treatment.

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Questions**

- 1) What is the bacteria load reduction efficiency?
- 2) How effective are the catch basin, storm drain and trash segregation unit installations at reducing loads of priority pollutants?

#### **Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

#### **Assessment Method(s)**

- 1) Inspections (e.g., ensure the treatment is working as designed)
- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)
- 4) Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials)
- 5) Reporting (e.g., estimates of load reduction from 3rd party data)

#### **Data Recorded**

N/A

### **EXPECTED BENEFITS**

The goal of this assessment will be to determine the project's effectiveness and efficiency for reducing bacteria, metals, and nutrient loads.

### **ANALYSIS RESULTS**

This project is still in the design phase and has not been implemented; therefore, effectiveness assessment has not been completed at this time. Assessment will be conducted after project completion.

### **CONCLUSIONS**

Water quality monitoring will be conducted after construction to assess the effectiveness in reducing runoff volume and pollutant loading in order to determine pollutant load reduction and to make conclusions on the effectiveness of this type of project.

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**TITLE: BEACH AREA LOW FLOW STORM DRAIN DIVERSION**  
**PROJECT, PHASE III**  
**ID #: MB-1018**

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### **ACTIVITY IMPLEMENTATION**

In 1997, the Beach Area Low Flow Diversion Project was created at the request of the San Diego Council Members Wear and Mathis. Storm drain outfalls along the coastline were inventoried and each drain outfall was rated for the potential for human contact with the flow from the drain (i.e. flow crosses the beach). Outfalls, which were labeled by the street name location, were identified as having high or medium potential were studied to determine the feasibility and cost of diverting low flows to the wastewater collection system. High priority sites due to continuous urban runoff flows during dry weather became Phase I of the project. As a result, Phase I low flow diversion facilities included Tourmaline, Bonair/Neptune, Ravina, Avenida de la Playa, Vallecitos, Camino del Oro, and south of Vista de la Playa. These sites became operational in 1998 and 1999 at a cost of \$1 million.

Phase II projects included El Paseo Grande, Spindrift, Children's Pool, 711 Coast Boulevard, Coast Boulevard (at lifeguard station), 465 Coast Boulevard, Coast Boulevard at Pump Station 24, Neptune and Belvedere, Neptune and Westbourne, Neptune at Playa Del Norte, Neptune at Playa Del Sur, Neptune at Gravilla, Neptune at Kolmar, Neptune North of Kolmar, Neptune at Rosemont, Neptune at Palomar, Coast Boulevard at Grand, and Ocean Boulevard at Grand. Phase II projects became operational by July of 2007.

Phase III projects include Missouri Street, Chalcedony, Law Street, Chelsea Avenue, Marine Street, Fern Glen, Point Loma Avenue, Felspar Street, and South of Loring Street. These facilities became operational in August 2009. The warranty period on the construction expired in August 2010.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creek Bacteria TMDL
- Tecolote Creek Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Phase III projects are operational and out of the warranty period. This project is complete.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens

- Metals
- Nutrients

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area (WMA) and the City's *Strategic Plan for Watershed Activity Implementation* identify bacteria, metals and nutrients as high priority water quality problems in the WMA, and recommend implementing load reduction/source abatement activities to address them. Installation of dry weather flow diversions will reduce loading of pollutants through runoff capture and treatment.

### **EFFECTIVENESS MEASUREMENTS**

Phase III projects include Missouri Street, Chalcedoney, Law Street, Chelsea Avenue, Marine Street, Fern Glen, Point Loma Avenue, Felspar Avenue, and South of Loring Street. All locations are diverting low flows and their associated pollutants to the sewer system.

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**TITLE: AVENIDA DE LA PLAYA STORM DRAIN REPLACEMENT AND  
LOW FLOW DIVERSION**  
**ID #: MB-1020**

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### **ACTIVITY IMPLEMENTATION**

During the City of San Diego's (City's) Beach Area Low Flow Storm Drain Diversion Project Phase I construction (briefly described in Activity Summary Sheet - MB-1018 Beach Area Low Flow Storm Drain Diversion Project, Phase III), a diversion was built upstream from the outfall at the beach on Avenida de la Playa with much of the flow from the large drainage area being diverted. However, there is significant dry weather flow from the area downstream of the diversion. The invert elevation of the existing beach outfall is at the mean sea level and sand regularly blocks all flow, except during the largest winter storms. Dry weather flows collect and stagnate, creating a known source of bacterial discharge to the receiving waters of the La Jolla State Marine Conservation Area (Area of Special Biological Significance (ASBS) No. 29). The City is proposing a second dry weather diversion facility closer to the point of discharge at the beach along Avenida de la Playa and replacement of the pipe due to the dry weather issues, tidal intrusion, groundwater intrusion, and other issues associated with the current condition of the pipe.

In late FY 2008, the City prepared a concept proposal, including this project, to apply for funds under the State's Proposition 84 ASBS Grant Program.

The goal of this project is to eliminate bacteria loads and other pollutants, such as metals and nutrients, typically discharged through low flows to the ASBS by replacing 1,173 linear feet of existing storm drain with a new reinforced concrete box (RCB) culvert and a dry weather diverter located near the outfall.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creek Bacteria TMDL
- Area of Special Biological Significance Nos. 29 and 31

### **TIME SCHEDULE FOR IMPLEMENTATION**

The project was transferred to the Preliminary Engineering section of the Engineering & Capital Projects Department in September 2008 for the purpose of managing the project through design, construction and project close out. Preliminary engineering was completed in April 2009 and the project was transferred to design in June 2009. A design consultant was hired and the project is currently working on 30% design. Design is anticipated to finish in September 2012 with construction following.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

- N/A

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Metals
- Nutrients
- Trash

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area (WMA) and the City's *Strategic Plan for Watershed Activity Implementation* identify bacteria, metals and nutrients as high priority water quality problems in the WMA, and recommend implementing load reduction/source abatement activities to address them. By replacing 1,173 linear feet of existing storm drain with a new reinforced concrete box (RCB) culvert and a dry weather diverter located near the outfall, sediment will no longer be trapped within the pipe allowing bacteria to grow within the warm waters and sediments contained in the pipe.

**EFFECTIVENESS MEASUREMENTS****Management Questions**

- 1) What is the load reduction efficiency of the storm drain diversions?
- 2) How efficient are these diversions at reducing loads of priority pollutants?

**Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

**Assessment Method(s)**

- 1) Inspections (e.g., ensure the system upgrades are working as designed)
- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)
- 4) Tabulation (e.g., amount of money spent on implementation and maintenance)
- 5) Reporting (e.g., estimates of load reduction from 3rd party data)

**Data Recorded**

N/A

**EXPECTED BENEFITS**

The goal of this analysis is to determine the diversion project's effectiveness and efficiency in reducing pollutant loads.

**ANALYSIS RESULTS**

Assessment is not possible at this time, as the project is still in the design phase. Post-construction monitoring will be conducted and effectiveness assessment will be completed once the project is complete. Efficiency will be determined by comparing load reduction to implementation costs.

## **CONCLUSIONS**

Once the project is complete and the effectiveness assessment has been conducted, conclusions will be made as to future implementation of other similar activities.

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**TITLE: MISSION BAY AND COASTAL BEACHES SEWER INTERCEPTOR SYSTEM UPGRADES**  
**ID #: MB-1021**

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### **ACTIVITY IMPLEMENTATION**

In 1987, the City of San Diego (City) committed to expand the low flow diversion system around Mission Bay with the Mission Bay Sewage Interceptor System (MBSIS) project. This initial project provided interception capability for 65 drain outlets within the remaining 10 percent of the tributary drainage basin. At a cost of \$9 million, the project was completed in 1994 and expanded the number of facilities to 46 (14 pump stations and 32 gravity systems). A telemetry control system was also included to provide a more efficient operation. The remote telemetry automatically was used to shut down each facility whenever it rains. Therefore, the labor-intensive effort of physically shutting down each facility was avoided. The new storm water pumping station constructed in Mission Beach at Santa Clara Point was constructed with low flow pumps to divert dry weather flows to the wastewater collection system.

The current CIP project provides for the design and construction of upgrades to 31 sites within MBSIS.

Three Congressional Federal Grants were issued through EPA's Appropriations Act totaling approximately \$10 million. These grants fund 55% of the design, environmental, and construction costs of Coastal Low Flow (CLF) Phases II, III and IV (see Activity Sheets MB-1018 Beach Area Low Flow Storm Drain Diversion Project, Phase III and MB-1013 La Jolla Shores ASBS Pollution Control Program (aka Low Flow Diversions Phase IV) for more information) as well as the design and environmental costs for MBSIS. In order to be eligible for these federal grants, each of the phases must clear the EPA's National Environmental Policy Act (NEPA), a process that can span up to a year. These grants are reimbursable. The matching funds for the grant are being paid by the Deferred Maintenance Bond (Bond).

Upon receiving enough funding to move forward, the project advertised for construction bids in November 2009 and was awarded to the lowest responsible bidder in June 2010. Construction was completed in Spring 2011.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

The project was awarded to the lowest responsible bidder in June 2010. Construction began in August 2010 and finished in Spring 2011. Effectiveness assessment is expected in FY12.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A



**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Trash

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area (WMA) and the City's *Strategic Plan for Watershed Activity Implementation* identify bacteria as a high priority water quality problem in the WMA. Identification of the sources of bacteria in the WMA will help the City focus its efforts in abating sources and implementing activities that reduce pollutant loading.

**EFFECTIVENESS MEASUREMENTS****Management Questions**

- 1) How effective are the upgrades at reducing loads of priority pollutants?

**Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

**Assessment Method(s)**

- 1) Inspections (e.g., ensure the system upgrades are working as designed)
- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., outfall monitoring programs)
- 4) Reporting (e.g., estimates of load reduction from 3rd party data)

**Data Recorded**

N/A

**EXPECTED BENEFITS**

The goal of this assessment is to determine the effectiveness and efficiency of the upgrades to the MBSIS flow diversion system in reducing bacteria load and improving water quality.

**ANALYSIS RESULTS**

Effectiveness will be determined after the upgrades are completed through an assessment of load reduction/source abatement.

**CONCLUSIONS**

Conclusions will be made at the completion of the activity, after implementation and assessment is complete.

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**TITLE: LINDBERGH PARK LIMITED LOW FLOW STORM DRAIN  
INLET MULTI-POLLUTANT TREATMENT**  
**ID #: MB-1022**

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### **ACTIVITY IMPLEMENTATION**

This project will implement a proprietary inlet treatment device at Lindbergh Park. This inlet device is a modular wetland filtration device which uses a combination of biological and engineered media to treat multiple pollutants in storm water runoff. The runoff enters the device through the storm drain inlet, flows through the filtration media, and discharges back into the storm drain.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

The concept design for this project was completed in June 2010. Transfer to the Engineering & Capital Projects Department for design and construction is anticipated in FY 2013. Construction is anticipated in FY 2016.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Nutrients

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area identify bacteria and nutrients as high priority water quality problems throughout the Mission Bay and La Jolla WMA

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Questions**

- 1) What is the bacteria and nutrient load reduction efficiency?

#### **Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

#### **Assessment Method(s)**

- 1) Inspections (e.g., ensure the treatment is working as designed)

- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)
- 4) Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials)
- 5) Reporting (e.g., estimates of load reduction from 3rd party data)

**Data Recorded**

N/A

**EXPECTED BENEFITS**

The goal of this assessment is to determine the project's effectiveness and efficiency for reducing pollutant loads with the installation of proprietary devices such as engineered wetlands.

**ANALYSIS RESULTS**

This project is still in the preliminary engineering phase and has not been implemented; therefore, effectiveness assessment has not been completed at this time. Assessment will be conducted after project completion.

**CONCLUSIONS**

Water quality monitoring will be conducted before and after construction to assess the effectiveness in reducing runoff volume and pollutant loading in order to determine pollutant load reduction and to make conclusions on the effectiveness of this type of project.

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**TITLE: LA JOLLA SHORES LANE LIMITED LOW FLOW STORM  
DRAIN INLET MULTI-POLLUTANT TREATMENT**  
**ID #: MB-1023**

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### **ACTIVITY IMPLEMENTATION**

This project will implement a proprietary inlet treatment device at La Jolla Shores Lane. This inlet device is a modular wetland filtration device which uses a combination of biological and engineered media to treat multiple pollutants in storm water runoff. The runoff enters the device through the storm drain inlet, flows through the filtration media, and discharges back into the storm drain.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks TMDL
- ASBS Nos. 29 and 31

### **TIME SCHEDULE FOR IMPLEMENTATION**

The concept design for this project was completed in June 2010. Transfer to the Engineering & Capital Projects Department for design and construction is anticipated in FY 2013. Construction is anticipated in FY 2016.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Nutrients

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area identify bacteria and nutrients as high priority water quality problems throughout the Mission Bay and La Jolla WMA

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Questions**

- 1) What is the bacteria and nutrient load reduction efficiency?

#### **Targeted Measurable Outcome(s)**

- 1) Reduction in priority pollutant loads

#### **Assessment Method(s)**

- 1) Inspections (e.g., ensure the treatment is working as designed)

- 2) Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)
- 3) Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)
- 4) Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials)
- 5) Reporting (e.g., estimates of load reduction from 3rd party data)

**Data Recorded**

N/A

**EXPECTED BENEFITS**

The goal of this assessment is to determine the project's effectiveness and efficiency for reducing pollutant loads with the installation of proprietary devices such as engineered wetlands.

**ANALYSIS RESULTS**

This project is still in the preliminary engineering phase and has not been implemented; therefore, effectiveness assessment has not been completed at this time. Assessment will be conducted after project completion.

**CONCLUSIONS**

Water quality monitoring will be conducted before and after construction to assess the effectiveness in reducing runoff volume and pollutant loading in order to determine pollutant load reduction and to make conclusions on the effectiveness of this type of project.

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**TITLE:                   PET WASTE BAG DISPENSER PROGRAM PHASE II**  
**ID #:                    MB-1025**

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### **ACTIVITY IMPLEMENTATION**

The purpose of the activity is to assess the effectiveness of installing pet waste stations at Home Owners Associations and Business Improvement Districts. When pet waste bags are available, pet owners are more apt to pick up pet wastes and dispose of it properly, thereby eliminating pollutants from the environment and potentially from receiving waters. The assessment focused on evaluating the installation of pet waste stations as a best management practice (BMP) in reducing pollutant loading in correlation with the number of bags deployed. The project includes site evaluations and selections, the installation of pet waste bag dispensers and all-in-one pet stations (dispenser and trash receptacle), pre- and post- site observations for the effectiveness assessments.

The sites were evaluated using a two-step process to screen and select potential project sites. An initial desktop site screening process was performed to identify candidate sites. Site visits were conducted at these locations to further assess the location and gather information used in the selection process.

Initial criteria used to identify the sites included: 1) areas of concentrated dog use adjacent to residential neighborhoods, 2) community and Storm Water Division staff input, 3) potential for partnerships to conduct ongoing operation and maintenance, and 4) positive community acceptance.

Geographical Information System maps depicting potential residential areas, trails, parks, schools, dog parks, and other points of interest, as well as water bodies that are 303(d) listed as impaired for bacterial indicators, nitrogen, and phosphorous, were used during the screening process to develop an initial list of potential project locations.

Based on the results of the initial screening and site assessment visits, the preliminary project locations for each watershed were further evaluated for: 1) dog-related activities within each area, 2) the availability of trash receptacles 3) the absence of pet waste receptacles, 4) the degree of pet waste observed, 5) the potential for vandalism, 6) the priority within the watershed, and 7) the potential for a site-specific contact group to be the point of contact at each site. Mission Bay and La Jolla WMA were selected: site in the Turquoise Street Business District in the Pacific Beach Community and another in the UTC Residential neighborhood in the community of University City at a SDGE utility easement. During the initial assessments for site selection, a moderate degree (between 10 and 20 piles) of pet waste was observed at the Turquoise Street location; a high degree (more than 20 piles) of pet waste was observed at the UTC location.

One pet waste bag dispenser station with sign was installed at the Turquoise Street location. At the UTC location a sign only was installed. This allowed an assessment to be conducted to determine whether signs are an effective implementation technique in reducing pet waste.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL

**TIME SCHEDULE FOR IMPLEMENTATION**

Project planning and design started in FY 2010. Installation of the pet waste bag dispensers and the effectiveness assessment concluded during FY 2011.

**LEAD WATERSHED COPERMITTEE**

- City of San Diego

**OTHER PARTICIPATING COPERMITTEES**

N/A

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay and La Jolla WMA identify bacteria as high priority water quality problems and recommends implementing load reduction/source abatement activities to address them. Implementation of this activity will address the high priority water quality problems by reducing exposed pet waste carrying bacteria.

**EFFECTIVENESS MEASUREMENTS****Management Questions**

- 1) What are the high pet waste use areas throughout the City where pet waste creates a pollution issue?
- 2) What is the most cost-effective pet waste station configuration?
- 3) What are the installation and operations and maintenance costs associated with pet waste stations?
- 4) What types of opportunities for partnerships exist for businesses, HOAs, and other community groups to sponsor pet waste stations operations and maintenance?

**Targeted Measurable Outcome(s)**

- 1) Reduction in pet waste from installation of pet waste stations.
- 2) Assessment of pollutant load reduction.
- 3) Decrease in pet waste through awareness from signage.

**Assessment Method(s)**

- 1) Monitor the pet waste reduction from pre-installation to post-installation.
- 2) Monitor overall pollutant load reduction from pet waste installations.
- 3) Monitor outcomes from sign only installation versus pet waste station installation.

**Data Recorded**

- 1) Weekly average of waste piles observed prior to installation (Turquoise Street): 13.3
- 2) Weekly average of waste piles observed prior to installation (UTC Residential (sign only)): 7.3
- 3) Weekly average of waste piles observed after installation (Turquoise Street): 6.7

- 4) Weekly average of waste piles observed after installation (UTC Residential (sign only)): 4.2
- 5) Weekly average number of bags dispensed (Turquoise Street): 14.3
- 6) Weekly average number of bags dispensed (UTC Residential (sign only)): N/A
- 7) Average Weekly waste pile reduction (Turquoise Street): 6.7
- 8) Average Weekly waste pile reduction (UTC Residential (sign only)): 3.1
- 9) Percent waste reduction (Turquoise Street): 50%
- 10) Percent waste reduction (UTC Residential (sign only)): 43%
- 11) Ratio of bags dispensed to pet waste piles removed (Turquoise Street): 2.2
- 12) Ratio of bags dispensed to pet waste piles removed (UTC Residential (sign only)): N/A

### **EXPECTED BENEFITS**

The City of San Diego Transportation & Storm Water Department, Storm Water Division (Storm Water Division) commissioned the Pet Waste Bag Dispenser Station Design and Implementation Project to assess the effectiveness of the installation of pet waste bag dispenser stations as a Best Management Practice (BMP) for reducing bacteria in the watersheds within the City of San Diego's jurisdiction. The first phase of the Project emphasized installing pet waste bag dispensers in partnership with the Parks and Recreation Department in community parks and at open space trailheads. This second phase of the Project focused on the installation of pet waste stations in residential housing areas in partnership with Homeowners Associations (HOA), Business Improvement Districts (BIDs), and other community groups. The intent was to assess the potential for community partnerships to assist with ongoing maintenance and operation of the bag dispenser stations.

### **ANALYSIS RESULTS**

Observations and pet waste pile counts were conducted for a total of twelve weeks. For six weeks prior to the installation of the pet waste bag dispensers, weekly observations and cleaning were conducted to assess the conditions at each site. An additional six weeks of observations were conducted after the installations. One of the locations was a site with signs only installed to assess the effectiveness of a sign only approach as an alternative. Prior to the installation of the pet waste bag dispensers a weekly average of 13.3 and 7.3 piles were observed at the Turquoise (dispenser and sign) and UTC (sign only) locations respectively.

After the installation of the pet waste bag dispenser and signage, a weekly average of 6.7 piles and 4.2 piles were observed at the Turquoise Street (dispenser and sign) and UTC (sign only) locations respectively. The observations show an average weekly reduction of 6.7 and 3.1 piles at the Turquoise (dispenser and sign) and UTC (sign only) locations respectively.

The average weekly reduction was calculated by subtracting the pre-installation average count of observed waste and the post-installation average count of observed waste. This translates to 50% reduction at the Turquoise Street location (dispenser and sign) and 43% reduction at the UTC (sign only) locations in the amount of pet waste piles observed.

### **CONCLUSIONS**

A review of the collected data revealed the installation of the pet waste bag stations and the installation of signs contributed to the reduction of pet waste piles within the study area. The



average number of bags dispensed weekly at the Turquoise Street (dispenser and sign) to an estimated removal of 2.9 pounds of pet waste per week, respectively. At the sign only site at UTC, reflected a weekly reduction of 3.1 piles.

Overall, this activity demonstrated that there are positive, measureable pollutant load reductions due to the installation of pet waste bag dispensers and related signage.

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**TITLE: SOURCE CONTROL OF COPPER WATER POLLUTANTS,  
SENATE BILL 346: MOTOR VEHICLE BRAKE FRICTION MATERIALS  
ID #: MB-1026**

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### **ACTIVITY IMPLEMENTATION**

Previous City of San Diego (City) investigations determined that copper from automotive brake pads was a major contributor of dissolved copper, a high priority water quality pollutant, to San Diego waterways within City jurisdiction. Because the regulation of automotive brake pads is beyond the authority of any local government, the City collaborated with other California local governments, through California Stormwater Quality Association, to achieve true source control by reducing copper at its source. It was determined that the best way to achieve this goal was through the development of legislation, mandating reductions and then replacement of copper in automotive brake pads.

The City of San Diego assisted with writing the proposed Senate Bill, provided financial resources for technical experts to assist with its development, participated in negotiations with the automobile and brake pad manufacturers, and provided lobbyist assistance to Senator Kehoe to obtain political support for the passage of the bill. Due to the automobile manufacturers renewed interest in this bill, negotiations were re-initiated to obtain support from all stakeholders, as required by the governor. The bill was rewritten multiple times and discussed by all parties before it was presented to Assembly subcommittees for review and approval. On September 25, 2010, SB346 was passed by both houses, signed into legislation by the governor, and incorporated into the California Health and Safety Code, Article 13.5, commencing with Section 25250.50. Work has concluded on this legislation bill.

### **TMDL APPLICABILITY**

- N/A

### **TIME SCHEDULE FOR IMPLEMENTATION**

SB346 calls for reductions of copper down to 5% by weight by 2021 and 0.05% by 2025. It is anticipated that copper loads from automotive brake pads will decline after the first reduction date in 2021.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- CASQA - assisted with writing the proposed Senate Bill, provided financial resources for technical experts to assist with its development, participated in negotiations with the automobile and brake pad manufacturers, and provided lobbyist assistance to Senator Kehoe to obtain political support for the bill's passage.
- Coalition for Practical Regulation - assisted with writing the proposed Senate Bill, provided financial resources for technical experts to assist with its development,

participated in negotiations with the automobile and brake pad manufacturers, and provided lobbyist assistance to Senator Kehoe to obtain political support for the bill's passage.

- Alameda County - provided financial resources for experts to assist with the bill's development, and provided lobbyist assistance to obtain political support for the bill's passage.
- Contra Costa County - provided financial resources for experts to assist with the bill's development, and provided lobbyist assistance to obtain political support for the bill's passage.
- Many San Diego Regional Copermittees provided letters in support of the legislation.

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Metals

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The City's *Strategic Plan for Watershed Activity Implementation* for the Mission Bay and La Jolla WMA identifies metals as a high priority water quality problem throughout the Chollas Creek WMA, and recommends implementing source control activities to address it. The activity's objective is to reduce the amount of copper that reaches our storm drains and receiving waters to improve and restore water quality for our citizens.

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Question**

N/A

#### **Targeted Measurable Outcome(s)**

- 1) Evidence of reductions of copper starting in 2022

#### **Assessment Method(s)**

N/A

#### **Data Recorded**

N/A

### **OBJECTIVES**

The goal of this legislation is to reduce the amount of copper released into the environment from automotive brake pads.

### **ANALYSIS RESULTS/CONCLUSIONS**

The authorization of this proposed legislation is expected to result in long-term reductions of copper from automotive brake pads to the environment.

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**TITLE: TARGETED CATCH BASIN CLEANING PILOT STUDY**  
**ID #: MB-1027**

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### **ACTIVITY IMPLEMENTATION**

The City of San Diego Storm Water Division began the planning of a catch basin cleaning pilot study in FY2011. The purpose of the project is to understand the potential water quality improvements and load reduction associated with catch basin cleaning by evaluating the quantity and quality of materials removed from the storm drains from four pilot areas. The areas were selected to be representative of different land uses within the City limits. Additionally two cleaning methods will be evaluated - manual and using vacor equipment. One of the pilot areas is within the Mission Bay & La Jolla WMA near the Mesa College campus.

Composite samples collected from the material removed from the targeted catch basins will be analyzed for metals, nutrients, organics, and bacteria.

### **TMDL APPLICABILITY**

- San Diego Beaches and Creeks Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Implementation and assessment is scheduled for FY2012.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- N/A

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Metals
- Nutrients
- Sediment

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay & La Jolla WMA identify bacteria, metals, and nutrients as high priority water quality problems in the WMA, and recommend implementing load reduction/source abatement activities to address these constituents. This project will result in a quantifiable load reduction of sediment and will evaluate the amount of bacteria and metals reduced as part of catch basin cleaning.

## **EFFECTIVENESS MEASUREMENTS**

### **Management Questions**

- 1) To what extent do changes in catch basin cleaning frequency affect the amount of pollutants collected?
- 2) What is the annual calculated load reduction based on pilot scale data collection with catch basin cleaning?
- 3) Which cleaning method, manual versus mechanical is the most cost effective method for removing sediment from catch basins?

### **Targeted Measurable Outcome(s)**

- 1) Reduction in bacteria exported from the catch basin.
- 2) Reduction in sediment exported from the catch basin.
- 3) Reduction in nutrients associated with the catch basin.

### **Assessment Method(s)**

- 1) Evaluate the volume of material currently removed from each catch basin.
- 2) Evaluate the correction in cleaning results with land use category, impervious area, watershed size, and surface water impairments.

### **Data Recorded**

- 1) Volume Removed
- 2) Location
- 3) Sediment sample analysis

## **EXPECTED BENEFITS**

The project is expected to result in measured a load reduction.

## **ANALYSIS RESULTS**

The project will be implemented in FY2012 and results will be provided at the conclusion of the project.

## **CONCLUSIONS**

The project will be implemented in FY2012 and conclusions will be reported at the end of the project.

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**TITLE:                   PROPERTY-BASED WATERSHED INSPECTIONS**  
**ID #:                     MB-1028**

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### **ACTIVITY IMPLEMENTATION**

This activity builds upon the Geographically Based Business Property and Facility Inspections implemented in FY2010. See activity sheet MB-1006 from past annual reports. The current activity is part of a larger study in the San Dieguito River, Los Penasquitos, Mission Bay and La Jolla, San Diego River and Tijuana River watershed management areas (WMAs).

The City of San Diego (City) performed an inspection program activity specifically focused on properties with multi-businesses. The activity involved inspecting properties and the businesses located on the properties regardless whether they are part of the City's commercial and industrial inventory. Traditionally, the City performs individual business inspections in the City's commercial and industrial inventory.

The City developed and implemented a focused inspection activity designed to evaluate the effectiveness of performing multi-business property-based inspections and answer the following management questions related to the commercial and industrial inspections program:

- 1) Does focusing inspections and follow-up on property owners/managers increase BMP compliance?
- 2) Are Property-Based inspections feasible?

The areas selected for inspection were shopping centers, industrial parks, and office parks within the five watershed areas.

The inspections occurred over two phases. Property inspections and business investigations were conducted during both phases. During the first phase, inspectors performed a full inspection of each property. Properties were inspected for BMP compliance, general site observations, pollutant discharge potential, and illicit connections/illegal discharges (IC/IDs) similar to an individual business inspection. Site observations and BMP deficiencies were noted on the inspection form. When an issue was noted during the property inspection and could be associated to a particular business, the inspector initiated an investigation of the business, or businesses. These individual business inspections were limited to investigating the significant deficiencies observed. If an issue could not be associated to one or more businesses on the property, the issue was considered to be the responsibility of the property owner or management company, and no business inspections were performed.

The property inspection reports were sent to the property management company, or to the property owner on file. Where applicable, business inspections reports were sent to corporate offices. If a business was not part of a corporation, the report was sent directly to the business at its physical location, or mailing address.

In phase two of the activity, selected properties from phase one that were determined to be high priority follow-ups were inspected. Each property was inspected using the same procedures

utilized in the initial inspections. As a part of phase two, business investigations were also performed to those businesses likely responsible for potential storm water issue(s) in the area.

During both phases, if violations were identified, they were recorded for appropriate follow-up. Follow-up inspections occurred based on the severity of the identified violations. If discharges were identified, they were immediately reported to the City's Storm Water hotline number. Lastly, education material was distributed, as applicable, during phase one and two of the inspection activity.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creek Indicator Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Implementation and assessment took place during FY2011. This project is complete, and will no longer be included in future reporting updates.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

- City of San Diego

### **OTHER PARTICIPATING ENTITIES**

N/A

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Oil & Grease
- Sediment
- Trash

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's Strategic Plan for Watershed Activity Implementation and the Collective Watershed Strategy for the Mission Bay and La Jolla WMA identify bacteria as a high priority water quality problem throughout the WMA, and recommend implementing load reduction/source abatement activities to address it. Implementation of the property inspections contributes to addressing discharges, correcting behaviors, and abating sources associated with bacteria.

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Questions**

- 1) Does focusing inspections and follow-up on property owners/managers increase BMP compliance?
- 2) Are Property-Based inspections feasible?

**Targeted Measurable Outcome(s)**

- 1) Identification of sources of constituents of concern in the Mission Bay and La Jolla Watershed

**Assessment Method(s)**

- Inspections
- Quantification
- Monitoring
- Tabulation
- Reporting

**Data Recorded**Phase One Property Inspections

Number of property inspections = 13

Number of properties recommended for follow-up inspection = 1

Total IC/IDs Observed = 0

Total IC/IDs Eliminated During Inspection = N/A

Phase One Business Investigations

Number of business investigations = 3

Number of sites recommended for follow-up inspection = 1

Number of Sites That Implemented Some Corrective Action During Inspection (BMP implemented) (Outcome 3) = 0

Number of Sites with Assumed Source Abatement (based on corrective actions taken) (Outcome 4) = N/A

Total IC/IDs Observed = 0

Total IC/IDs Eliminated During Inspection = N/A

Phase Two Property Inspections

Number of property inspections = 0

Number of properties recommended for follow-up inspection = N/A

Total IC/IDs Observed = N/A Total IC/IDs

Eliminated During Inspection = N/A

Phase Two Business Investigations

Number of business investigations = 0

Number of sites recommended for follow-up inspection = N/A

Number of Sites That Implemented Some Corrective Action During Inspection (BMP implemented) (Outcome 3) = N/A

Number of Sites with Assumed Source Abatement (based on corrective actions taken) (Outcome 4) = N/A

Total IC/IDs Observed = N/A

Total IC/IDs Eliminated During Inspection = N/A

Overall Number of Sites That Implemented Some Corrective Action between the Two Phases (Outcome Level 3) = N/A



Number of Sites with Assumed Source Abatement (based on corrective actions taken) (Outcome 4) = N/A

### **EXPECTED BENEFITS**

The goal of this assessment is to determine the effectiveness of property-based inspections as a method to conduct inspections, which includes identifying and eliminating potential sources of storm water pollution.

### **ANALYSIS RESULTS**

During phase one, thirteen property inspections and three business inspections were conducted in the Mission Bay and La Jolla WMA. The analysis of the phase one inspection data showed no IC/IDs documented and only one follow-up inspection identified. With no IC/IDs and no high priority follow-up inspections found in this watershed, there were no phase two property and business inspections conducted. Budget and resources efforts were conducted in other watershed areas identified with greater BMP deficiencies, IC/IDs and higher follow-up inspections priorities.

Property inspections are an efficient and effective method to assess shared areas and evaluate visible, outdoor areas for BMP implementation at shopping centers, industrial parks, and office parks. There are some BMPs normally addressed during business inspections that did not apply to property inspections, as they require input from a business representative, or are requirements specific to business operations, such as employee training. Lastly, common areas that have the highest threat to water quality, such as trash, landscaping, and storm drain areas, can be effectively evaluated during a property inspection.

### **CONCLUSIONS**

Overall, property-based commercial and industrial inspections provide efficiency in both cost and coverage, with the ability to inspect a large area with multiple businesses in a short amount of time. Also common areas of high pollutant generating activities are addressed during these inspections, including IC/IDs, trash areas, landscaping and storm drain issues. There were no IC/IDs found during the first phase property inspections and business investigations in the Mission Bay and La Jolla River WMA. As an overall outcome in conducting this inspection activity in four other watersheds, there was a reduction of IC/IDs between the two phases of inspections. BMP implementation generally improved and follow-up inspection priorities improved between the inspection phases. The City can verify some business inspections also resulted in corrective actions taken immediately. Properties implemented some corrective action between the two phases of inspections. In total, three IC/IDs were eliminated during inspection. Although a load reduction was not calculated, abatement of potential sources may be assumed with corrective actions being implemented and IC/IDs eliminated; therefore, demonstrating both Level Three (change in behavior/BMP implementation) and Level Four (source abatement/load reduction) outcomes being achieved as a result of conducting the property-based inspection activity.

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**TITLE: Rainwater Harvesting Rebate Pilot Program**  
**ID #: MB-1029**

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### **ACTIVITY DESCRIPTION**

The City of San Diego Transportation & Storm Water Department, Storm Water Division collaborated with the Public Utilities Department in the planning of a Rainwater Harvesting Rebate Pilot Program (Rebate Pilot Program). During this reporting period staff from both departments met to discuss the application process, funding, administration, promotion, and other items related to the Rebate Pilot Program.

This Rebate Pilot Program will be open to the residents of the City of San Diego on a first come first serve basis and will provide a rebate of .50c per gallon, up to \$200 per address, for water capture devices up to 400 gallons that are purchased and installed. The Public Utilities Department will administer the Rebate Pilot Program in conjunction with its ongoing Prop 50 Outdoor Water Conservation Rebate Program.

### **TMDL APPLICABILITY**

San Diego Region Beaches and Creeks Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Planning started in the last quarter of FY 11 with a tentative implementation start date in FY12.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

- None

### **OTHER PARTICIPATING ENTITIES**

- City of San Diego Public Utilities Department

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- All

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's Strategic Plan for Watershed Activity Implementation and the Collective Watershed Strategy for the Mission Bay and La Jolla WMA identifies several water quality problems throughout the watershed. Rainwater harvesting reduces the overall amount of wet weather runoff and the demand for portable water for irrigation.

### **EFFECTIVENESS MEASUREMENTS**

Data to be recorded

- 1) Most common water catchment device installed
- 2) Average size of water catchment device installed

### **EXPECTED BENEFITS**

The use of water capture devices (e.g., rain barrels) reduces wet weather runoff to the MS4, and collected water also reduces the demand for portable water to irrigate landscaping.

### **ANALYSIS RESULTS**

This activity was not in active implementation in FY 2011. Therefore, assessment is not possible at this time.

### **CONCLUSIONS**

The project is currently being planned so there are no conclusions to report.

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**TITLE:                   GENESEE COMMERCIAL CBSM EFFORTS**  
**ID #:                     MB-2004**

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### **ACTIVITY IMPLEMENTATION**

The City of San Diego's Storm Water Department, Pollution Prevention Division (City) has been using Community Based Social Marketing (CBSM) strategies since FY 2008 in attempt to increase knowledge and change behaviors among various target audiences. CBSM is an environmental social science method of outreach which includes comprehensive research, data gathering, and assessment measures to develop more effective outreach strategies. The City has implemented several pilot projects in various communities, and assessment has confirmed success in achieving pollution prevention awareness and behavioral change.

In FY 2010, the City conducted focus group research with three business types found along the Genesee Ave. corridor; restaurants, automotive shops and landscapers. The research planned for the Genesee area is currently on hold based on the focus group feedback and the creation of an implementation plan. If and when the project moves forward, research and outreach in the Genesee area will be initiated. Outreach interventions and assessment methods will then be developed based on the research findings.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL
- Tecolote Creek Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

As noted above, this activity is on-hold.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Oil & Grease

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla Watershed Management Area (WMA) and the *Strategic Plan for Watershed Activity Implementation* identify bacteria and trash as high priority water quality problems in the WMA. This CBSM effort will result in both increased knowledge and awareness regarding bacteria and trash as a vector and future load reduction of trash and debris directly and of bacteria indirectly if and when it is implemented.

## **EFFECTIVENESS MEASUREMENTS**

### **Management Questions**

- 1) To what extent is there an observable difference in the level of either pollutants or polluting behaviors between the pre and post intervention observations?
- 2) How much change in awareness was achieved?
- 3) What changes in levels of behavior was achieved after implementation?
- 4) How does the pilot target area compare to non-pilot areas (based on surveys, observations and self-report result comparisons)
- 5) How do the survey results change pre and post activity implementation?

### **Targeted Measurable Outcome(s)**

- 1) Achieve increased awareness of bacteria and TMDL issues (e.g., reach 50% of the businesses in the target watershed)
- 2) Achieve higher incidence of knowledge and attitude in pilot group when compared to general public
- 3) Achieve increasing rates of knowledge and attitude or change in behavior with increased outreach (based on repeated survey results)

### **Assessment Method(s)**

- 1) Survey (e.g., administer survey to assess knowledge and attitude of participants)
- 2) Quantification (e.g., count observable pollution and behavior of participants in program)
- 3) Monitoring (e.g., water quality monitoring at base of targeted watershed)
- 4) Tabulation (e.g., amount of money spent on education and outreach, number of residents and households reached)
- 5) Reporting (e.g., estimates of load reduction based on 3rd party data, number of individuals or households reached)

### **Data Recorded**

N/A

## **EXPECTED BENEFITS**

The project is designed to reduce trash and bacteria from businesses along Genesee St. In addition to actual load reduction efforts, the project's outreach element will inform and educate business about the effects its work processes and employees have on the area its potential impacts to human health and the environment as a whole.

## **ANALYSIS RESULTS**

There are no analysis results as of this reporting period.

## **CONCLUSIONS**

There are no conclusions as of this reporting period.

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**TITLE: MT. ABERNATHY LID GREEN STREET OUTREACH**  
**ID #: MB-2005**

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### **ACTIVITY IMPLEMENTATION**

Mt. Abernathy Green Street Outreach will be performed to support the planned “Green Street” construction in a small sub-section of the Clairemont community in the Mission Bay and La Jolla Watershed Management Area (WMA). Construction may include modifying the vegetated planter areas between the curb and sidewalks in front of residential homes in order to better infiltrate runoff. Sidewalks and cul-de-sacs may also be retrofitted with porous paving. The City plans to inform, educate and involve residents who are directly affected by the construction in an attempt to achieve awareness regarding storm water runoff and to create behavioral change among residents. The City has retained several professional outreach consultants to assist, develop and initiate the public participation and education campaign. Activities may include public participation and outreach, education regarding structural interventions, incentives and specific messaging.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

The schedule for this outreach will parallel the Mt. Abernathy Low Impact Development (LID) Green Street Construction. Currently that project is on hold.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the Collective Watershed Strategy for the Mission Bay and La Jolla WMA and the *Strategic Plan for Watershed Activity Implementation* (Strategic Plan) identify bacteria and trash as high priority water quality problems in the WMA. This effort will result in both increased knowledge and awareness regarding bacteria and trash as a vector and future load reduction of trash and debris directly and of bacteria indirectly.

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Questions**

- 1) Does education regarding the LID retrofits effectively raise awareness of bacteria, metal and nutrient pollutant issues?

- 2) Does education regarding the LID retrofits effectively change pollutant behavior among residents?

**Targeted Measurable Outcome(s)**

- 1) Reach goal number of people within the Mission Bay and La Jolla WMA, based on survey results
- 2) Increased level of knowledge/attitude based on post-activity surveys

**Assessment Method(s)**

- 1) Survey (e.g., administer survey to assess knowledge and attitude of participants)
- 2) Quantification (e.g., number of residents reached)

**Data Recorded**

- 1) Number of educational information items passed out (Outcome Level 1)
- 2) Change in knowledge or attitude (Outcome Level 2)
- 3) Change in pollutant-related behavior (Outcome Level 3)

**EXPECTED BENEFITS**

Increase the level of awareness of storm water issues through the construction and advertisement of municipal LID BMPs.

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**TITLE: MISSION BAY FOCUSED OUTREACH**  
**ID #: MB-2009**

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### **ACTIVITY IMPLEMENTATION**

In order to prevent bacteria pollution in Mission Bay, the City of San Diego's (City's) *Think Blue program* implemented a summer outreach campaign in FY 2007 that targeted key sources of bacteria pollution in Mission Bay. In FY 2011, the campaign provided direct outreach during the major summer holidays (Independence Day 2010, Labor Day 2010 and Memorial Day 2011) to Mission Bay visitors, specifically recreational vehicle (RV) users and boaters. The outreach program is held according to the summer holidays in a calendar year, but reported according to Fiscal Years. The education focused on reducing pollution and bay closures as a result of contamination due to bacteria sources. In addition, direct outreach and materials distribution were conducted to marinas located in Mission Bay as an additional way to reach the target audience.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL
- Tecolote Creek Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Project planning was completed in 2007. Implementation was completed in 2011. Assessment was conducted in 2011.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Metals
- Trash

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Collective Watershed Strategy and the *Strategic Plan for Watershed Activity Implementation* for the Mission Bay and La Jolla Watershed Management Area (WMA) both identify bacteria as a high priority water quality problem in the WMA. This outreach effort will potentially result in both increased direct knowledge and awareness regarding bacteria and trash as a vector, and indirect future load reduction of trash and debris as they relate to bacteria.

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Questions**



- 1) What change in awareness /attitude regarding bacteria and trash pollutants was achieved after implementation?
- 2) How efficient is this education activity based on total cost versus number of people (targeted audience) reached?

**Targeted Measurable Outcome(s)**

- 1) Reach pre-set percentage of residents within target watershed
- 2) Increased level of knowledge/attitude based on post-activity surveys

**Assessment Method(s)**

N/A

**Data Recorded**

*Think Blue* FY 2009 Mission Bay Outreach Studies

Holiday:

Independence Day 2010

- 1) Number of Visitors to Outreach Booth: 197
- 2) Number of passers-by Observed: 1,700
- 3) Number of Visitors Approached: 61
- 4) Observed Boat Launches: 85
- 5) Observed Parked RVs: 103
- 6) Total Materials Distributed: 231

Labor Day 2010

- 1) Number of Visitors to Outreach Booth: 171
- 2) Number of passers-by Observed: 1,800
- 3) Number of Visitors Approached: 93
- 4) Observed Boat Launches: 113
- 5) Observed Parked RVs: 70
- 6) Total Materials Distributed: 197

Memorial Day 2011

- 1) Number of Visitors to Outreach Booth: 164
  - 2) Number of passers-by Observed: 1,100
  - 3) Number of Visitors Approached: 58
  - 4) Observed Boat Launches: 40
  - 5) Observed Parked RVs: 62
  - 6) Total Materials Distributed: 183
- Estimated total visitors (impressions) exposed to the *Think Blue* Booth in Mission Bay in FY 2011 (Outcome Level 1): 4,600
  - Estimated total visitors (impressions) exposed to the *Think Blue* Mobile Ad during Mission Bay Focused outreach (9 days) in FY 2011 (Outcome Level 1): 185,732
  - Number of marinas and boating businesses who participated in Mission Bay Outreach Campaign in FY2011 (Outcome Level 2): 42
  - Number of boating outreach materials distributed to businesses (Outcome Level 1): 1600
  - Number of Surveys administered in FY 2011 (Outcome Level 1): 493
  - Percentage of individuals surveyed who reported engaging in a behavior that would prevent pollution (Outcome Level 3): 78%
  - Percent increase from FY 2010 to FY 2011 of individuals surveyed who reported engaging in a behavior that would prevent pollution (Outcome Level 3): 5%

## **EXPECTED BENEFITS**

The activity has demonstrated an increase in knowledge and awareness in the target audience (Marinas, RVers, boaters and visitors in Mission Bay) and created positive behavioral change to reduce the presence of bacteria and gross pollutants in Mission Bay. Assessment was conducted to determine the effectiveness of the FY 2011 outreach campaign on creating increases in knowledge and changes in behavior.

## **ANALYSIS RESULTS**

The City's *Think Blue* campaign implemented an on-going summer outreach campaign in FY 2011 that targeted key areas of concern for pollution in Mission Bay. The campaign was conducted during the major summer holidays (Independence Day 2010, Labor Day 2010 and Memorial Day 2011) and provided direct outreach to Mission Bay users, specifically RV users and boaters. Efforts were made to increase awareness of pollutants sources (specifically bacteria), in order to reduce those sources, prevent pollution and avoid beach closures in Mission Bay. Examples of outreach activities included educational material distribution at the *Think Blue* booth, mobile ad display at the entrance of East Mission Bay, direct outreach to boaters and RV users in the area, and direct outreach to local marinas and boating businesses located in Mission Bay.

During FY 2011, approximately 4,600 visitors to East Mission Bay were exposed to *Think Blue's* Focused Mission Bay Outreach, which was promoting the message, "Help Keep Mission Bay Clean and Safe." Over 430 individuals approached the booth to speak with staff; over 200 Bay users were approached by staff, with over 1,700 people receiving pollution prevention outreach materials and items. The *Think Blue* Mobile Ad that was parked in the Mission Bay area at the entrance of East Mission Bay during the three holidays (9 days total) is estimated to have been viewed by 185,732 individuals based on traffic and pedestrians counts.

FY 2011 was the fifth year that *Think Blue* conducted Focused Mission Bay Outreach. *Think Blue* engaged in 9 days of direct outreach due to the fact that all three holidays in FY 2010 encompassed 3-day weekends. The alcohol beach ban that was approved during FY 2009, seems to continue to impact beach attendance, with decreased levels shown across City beaches. FY 2011 was the third year that *Think Blue* performed survey assessments. Of the 251 individuals who completed the assessment survey, 78% reported taking steps to prevent pollution. This result can be considered an indicator of a Level 3 Outcome.

## **CONCLUSIONS**

Mission Bay Focused Outreach is an effective way to reach visitors in East Mission Bay during the major summer holidays. The large numbers of impressions (over 4,600 exposed to *Think Blue* booth, and 185,732 exposed to mobile advertising), direct contacts (approx 600 persons), educational materials distributed (1,742 items) and survey participation in FY 2011 support the assertion that the focused outreach program is effective at increasing public exposure to bacteria and gross pollutant issues. More of the public is now aware of storm water issues and the *Think Blue* campaign due to this focused outreach.

## **RECOMMENDATIONS**

Implementation of the campaign will continue in FY 2012, to include hosting the outreach booth and continued distribution of the specialized informational postcards tailored to RV users, boaters, and general visitors. The program intends to move to another location in Mission Bay to reach boaters and tourists who may not have come in contact with the outreach program in the past. Assessment surveys will continue and increased effort to gather statistically valid information regarding knowledge, attitudes and pollution prevention behavior of Mission Bay visitors. Outreach in FY 2012 will continue with expanded targeted Marina and boater outreach. Effectiveness will be measured further via surveys comprised of residents in the Mission Bay and La Jolla WMA to determine awareness, knowledge retention and behavior change.

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**TITLE:                   SAN DIEGO CREW CLASSIC**  
**ID #:                     MB-2011**

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### **ACTIVITY IMPLEMENTATION**

In order to prevent bacteria pollution in the Mission Bay & La Jolla Watershed Management Area (WMA) in FY 2011, the City of San Diego's *Think Blue* program participated in the San Diego Crew Classic, a rowing regatta held in Crown Point Shores in Mission Bay. The outreach campaign provided direct outreach dedicated to preserving water quality in San Diego, primarily targeting key sources of bacteria in Mission Bay. The goal was to encourage everyone to take positive steps in preventing pollution from entering the storm drain system and ultimately Mission Bay. With more than 15,000 people in attendance, our presence provided a great opportunity to increase direct public education and interact with citizens and visitors about the benefits of pollution prevention.

*Think Blue* participated in the event by hosting a booth during both days of the event. *Think Blue* once again served as the Official Program Sponsor in FY 2011, as well as the Trophy Sponsor of the City of San Diego Cup, also known as the Men's Club Championship. The outreach booth provided direct education and materials regarding water quality protection. Materials distributed included brochures and tip cards, along with best management practice (BMP) items such as dust pans, pet trash bag containers and pet trash bag refills that help promote behavior change. Promotional giveaways included eco-friendly pens, Frisbees, backpacks, and rally towels.

Other outreach items and activities included:

- 1) Specialized postcards targeting Mission Bay RV users and boaters, which were available in both English and Spanish
- 2) Placement of a 10 foot *Think Blue* banner at the official race finish line which was visible on camera on national TV. Placement of six additional banners throughout the event venue.
- 3) A Think Blue PSA was broadcast multiple times on the JumboTron screen which was broadcasting live coverage of the event. In addition, the event was re-broadcast on ESPN, and several Think Blue PSA's were aired during the national broadcast.
- 4) Over 50 recycling bins at the event were marked with *Think Blue* stickers that indicated, "Recycle Here"
- 5) *Think Blue* donated the Think Blue Hospitality tent for use by the Men's National (Olympic) Rowing Team. The team assisted in promoting pollution prevention and sustainability, which allowed the partnership with Crew Classic to promote increased awareness of Think Blue among young adults in the watershed.
- 6) Event surveys were collected from over 500 booth visitors to gather assessment information about knowledge, awareness, attitudes and behaviors regarding storm water pollution prevention

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

*Think Blue* plans to participate in the Crew Classic during FY 2012.

**LEAD WATERSHED COPERMITTEE**

- City of San Diego

**OTHER PARTICIPATING COPERMITTEES**

- N/A

**OTHER PARTICIPATING ENTITIES**

- Mission Bay stakeholder groups (OMBAC, ZLAC Rowing Club, Mission Bay Planning Committee, etc.)

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Oil & Grease
- Trash

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay and La Jolla WMA identify bacteria as a high priority water quality problem throughout the WMA, and recommend implementing load reduction/source abatement activities to address them. Implementation of this outreach effort will result in both increased knowledge and awareness regarding bacteria and trash as a vector and future load reduction of trash, debris and bacteria.

**EFFECTIVENESS MEASUREMENTS****Management Questions**

- 1) What change in awareness /attitude regarding bacteria and trash pollutants was achieved after implementation?
- 2) How efficient is this education activity based on total cost versus number of people (targeted audience) reached?

**Targeted Measurable Outcome(s)**

- 1) Reach pre-set percentage of residents within target watershed
- 2) Increased level of knowledge/attitude based on post-activity surveys

**Assessment Method(s)**

- 1) Survey (e.g., administer survey to assess knowledge, attitude and willingness to prevent pollution of participants)
- 2) Quantification (e.g., number of residents/ visitors reached and number of materials distributed)

**Data Recorded**

*Think Blue* FY 2010 Crew Classic Event

Crew Classic, 2010:

- 1) Number of Booth Visitors: 500+
- 2) Gender: Approx. 38% Male; 62% Female
- 3) Number of Surveys Given: 194 Litter; 161 Pet; 104 Auto; 459 Total
- 4) How have you heard about Think Blue?: 30% TV/radio; 41% Events; 29% Others
- 5) Is stormwater treated?: 50% No; 11% Yes; 38% DK

- 6) Total number of Materials Distributed: 482
- Estimated total visitors exposed to the Think Blue Booth at the Crew Classic in FY 2010 (Outcome Level 1): 15,000
  - Number of surveys administered in FY 2010 (Outcome Level 1): 459
  - Percentage of individuals surveyed that believed that pet waste contributes to storm water pollution (Outcome Level 2): 99%
  - Percentage of individuals surveyed that believed that automotive fluids contribute to storm water pollution (Outcome Level 2): 98%
  - Percentage of individuals able to name a concrete action (either general or automotive) to prevent storm water pollution (Outcome Level 3): 80%
  - Percentage of individuals surveyed who reported picking up after their dog (always or sometimes) to prevent pollution (Outcome Level 3): 96%
  - Percentage of individuals surveyed who reported that they would take steps (such as maintain their car, drive less and use drip pans) to prevent automotive pollution (Outcome Level 3): 79%

### **EXPECTED BENEFITS**

*Think Blue's* booth provides a mechanism for continued outreach dedicated to preserving water quality in San Diego, and specifically Mission Bay. The goal was to provide education to increase knowledge and awareness and encourage everyone to take positive steps in preventing pollution from entering the storm drain.

### **ANALYSIS RESULTS**

The campaign targeted key audiences and areas of concern for pollutants in the Mission Bay WMA. The event provided direct outreach to residents living within the Mission Bay area as well as visitors to the event. It should be noted that this event is an international collegiate regatta (rowing competition), therefore although this event attracts a local crowd, many attendees are from other areas outside of San Diego.

A total of 459 *Think Blue* booth visitors completed the event survey assessment cards in FY2011, comprised of surveys specific to pet waste, litter and automotive pollution. Of the 459 surveys conducted 36% were from San Diego County, and the rest were from outside of San Diego County. 50% of all survey participants knew that storm water wasn't treated, while 15% said it was treated and 35% stated that they didn't know.

#### **FY 2011: Crew Classic (Litter) Survey Participant Characteristics**

- A total of 194 surveys were completed at the Crew Classic event on April 1, 2 and 3, 2011 (99% English, 1% Spanish).
- 190 participants provided their gender. Of these, 34% were male and 66% were female.
- The average age of respondents was 38 years (N=185).
- Of the respondents who provided residency information, 75% were from the state of California, and 32% reported being from San Diego County (N=188) (North County=6%, South County=1%, East County=3%, Central County=22%).
- 41 respondents (22%) listed an address in the City of San Diego.
- 13% of participants provided an address or e-mail to be added to the Think Blue mailing list.

### Knowledge and Awareness

- 31% of respondents had seen or heard of Think Blue before attending the event, 69% had not heard of Think Blue.
  - Of those who had heard of Think Blue before, 36% saw or heard of it on television, 17% heard of it at another event and 7% heard of it at school.
- 48% of respondents knew that storm water is not treated, 13% believed it was treated, and 39% reported that they did not know.
- When asked “How often do you see litter in your community that is not cleaned up?” 86% said that they see litter at least sometimes (Always=10%, Often=36%, Sometimes=40%, Rarely=12%, Never=2%) (M=3.41 on a 5-pt scale).
- When asked how much litter contributes to pollution of local waterways, 61% said a lot, 33% said a moderate amount and 6% said a small amount or not at all (M=3.55 out of 4).

### Behavior

- Just under half of respondents (47%) reported that they always or often pick up litter in their community and put it in the trash can. 41% reported that they sometimes do, and 12% said rarely or never (M=3.45 on a 5-pt scale).
- Respondents were asked to identify which items they may have dropped on the ground in the past year. The highest percentage (42%) said they littered fruit or vegetable peels, followed by 27% who admitted they had dropped gum, and 19% who said they littered coffee or some other liquid.
- 146 participants (75%) provided an answer when asked to name a reason they had littered in the past. 35% said they never litter, 19% said there was no trash receptacle nearby and 11% said they were lazy or careless.
- When asked to rate how strong of an obligation they feel to NOT litter, 65% said they feel a very strong obligation, 25% said they feel a strong obligation, 9% said they feel some obligation and 1% said they feel no obligation.

### FY 2011: Crew Classic (Automotive) Survey Participant

#### Characteristics

- A total of 104 surveys were completed at the Crew Classic event on April 1, 2 and 3, 2010 (100% English).
- 102 participants provided their gender. Of these, 32% were male and 68% were female.
- The average age of respondents was 37 years (N=101).
- Of the respondents who provided residency information, 76% were from the state of California, and 38% reported being from San Diego County (N=101) (North County=5%, South County=1%, East County=7%, Central County=25%).
- 25 respondents (25%) listed an address in the City of San Diego. 6) 21% of participants provided an address or e-mail to be added to the Think Blue mailing list.

### Knowledge and Awareness

- 44% of respondents had seen or heard of Think Blue before attending the event, 56% had not heard of Think Blue.
  - Of those who had heard of Think Blue before, 39% saw or heard of it at another event, 21% saw or heard of it on television and 7% heard of it at school.

- 56% of respondents knew that storm water is not treated, 13% believed it was treated and 31% reported that they did not know.
- When asked how much automotive fluids contribute to pollution of local waterways, 56% responded a lot, 34% said a moderate amount, 8% said a small amount and 2% responded not at all (M=3.44 out of 4).
- Respondents could check multiple answers when asked “Which of the following are correct methods for cleaning up automotive fluids?” 86% correctly responded that the best method is to soak it up with absorbent material and throw it in the trash, 12% responded that it is correct to hose it off immediately and 5% responded that leaving it to dry was correct.
- When asked how often they see automotive fluids leaked onto streets, 21% said often, 52% responded sometimes, 19% said rarely and 8% responded never (M=2.86 on a 5-pt scale).

#### Behavior

- 88% of respondents said that they do own a car, truck or SUV.
- 77% reported that a mechanic changes the oil in their vehicle, followed by 11% who said a friend or relative changes it and 11% who said that they change it themselves.
- Respondents could check multiple answers when asked “Where do you wash your car?” The largest percentage (63%) said they use a carwash, followed by 33% who said they wash it in the driveway or street and 9% who said they wash it on the lawn.
- 88 respondents (85%) provided a concrete action they could take to prevent pollution caused by automotive fluids. The most common responses were Maintain Auto (28%), Recycle/Dispose of Used Oil Properly (13%) and Drive Less (10%).

#### FY 2011:

##### Crew Classic (Pet) Survey Participant

#### Characteristics

- A total of 161 surveys were completed at the Crew Classic event on April 1 through April 3, 2011 (100% English).
- 155 participants provided their gender. Of these, 42% were male and 58% were female.
- The average age of respondents was 40 years (N=151).
- Of the respondents who provided residency information, 78% were from the state of California, and 36% reported being from San Diego County (N=151) (North County=11%, East County=2%, Central County=23%).
- 35 respondents (23%) listed an address in the City of San Diego. 6) 18% of participants provided an address or e-mail to be added to the Think Blue mailing list.

#### Knowledge and Awareness

- 35% of respondents had seen or heard of Think Blue before attending the event, 65% had not heard of Think Blue. Of those who had heard of Think Blue before, 35% saw or heard of it on television, 26% heard of it at another event and 9% heard of it at school.
- 55% of respondents knew that storm water is not treated, 16% believed it was treated, and 29% reported that they did not know.



- When asked “How often do you see dog waste in your community that is not cleaned up?” 78% said that they see dog waste at least sometimes (Always=7%, Often=35%, Sometimes=36%, Rarely=19%, Never=3%) (M=3.24 on a 5-pt scale).
- When asked how much dog waste contributes to pollution of local waterways, 25% responded a lot, 47% said a moderate amount, 27% said a small amount and 1% responded not at all (M=2.95 out of 4).
- Respondents could check multiple answers when asked “Which of the following are correct methods of disposing dog waste?” 83% correctly responded that the best method is to put it in the trash can, 21% responded that it is correct to bury it and 8% responded moving it to a landscaped area was correct.

#### Behavior

- 57% of respondents said that they do have a dog.
- Respondents could select multiple answers when asked “Where do you most often walk your dog?” 79% reported that they walk their dog in their neighborhood, followed by 22% who said they walk their dog in the park and 12% who said they walk their dog at the beach.
- 84% of respondents reported that they always pick up after their dog while on walks, 8% said they usually do, 4% said they sometimes do and 4% responded they never do (M=3.72 out of 4).

#### **CONCLUSIONS**

The San Diego Crew Classic attracts a large number of residents living in the local watershed areas as well as visitors from outside the area. The event provides a great opportunity to interact with citizens and visitors about the benefits of pollution prevention. With more than 15,000 people in attendance and the significant increase in surveys collected from FY 10, *Think Blue* will continue to sponsor this event in FY12.

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**TITLE: MISSION BAY AND LA JOLLA WATERSHED BROCHURE**  
**ID #: MB-2012**

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### **ACTIVITY IMPLEMENTATION**

The City of San Diego (City) and *Think Blue* will implement a new brochure program for the six (6) watershed management areas (WMAs) assigned to the City. These brochures will be used to inform San Diego residents on the benefits of taking steps to reclaim an environmentally and economically healthy watershed. The education pieces will help address high priority water quality problems in each WMA. It will also be used to make citizens aware of specific pollutants and ways individual action can be used to protect each water source as a way to promote a watershed stewardship (all individual actions within each watershed adds up in a cumulative way to influence the health of the water resource).

The main goals of the brochures are to capture the audience's attention, enhance the understanding of basic watershed principals of the public, address the high priority water quality problems in each WMA, educate best management practices (BMPs) for future use, and encourage citizens to take positive steps in preventing pollution from entering the storm drain system.

The following WMAs will have a watershed specific brochure created:

- 1) Tijuana River
- 2) San Diego River
- 3) San Diego Bay
- 4) Mission Bay
- 5) San Dieguito River
- 6) Los Peñasquitos

### **TMDL APPLICABILITY**

- Brochures will target pollutants associated with TMDLs as applicable.

### **TIME SCHEDULE FOR IMPLEMENTATION**

Project planning began in FY 2009 and will continue through FY 2012. Implementation and distribution is expected to occur in early FY 2012.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Conditions

- Dissolved Minerals
- Metals
- Nutrients
- Oil & Grease
- Organics
- Pesticides
- Sediment

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

This activity will address the high priority water quality problems identified in both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for each of the Watershed Management Areas.

### **EFFECTIVENESS MEASUREMENTS**

#### **Management Questions**

- 1) Can we create watershed brochures that increase the public's understanding of basic watershed principals and storm water best management practices (BMPs) and create awareness of the high priority water quality problems in each WMA?
- 2) Can we create watershed brochures that encourage citizens to take positive steps in preventing pollution from entering the storm drain system?

#### **Targeted Measurable Outcome(s)**

- 1) Increased knowledge of basic watershed principles and storm water BMPs after reading the watershed brochure.
- 2) Increased awareness of the high priority water quality problems in each WMA after reading the watershed brochure.
- 3) Increased intent to act to prevent storm water pollution after reading the watershed brochure.

#### **Assessment Method(s)**

- 1) Assessment is still being developed for this activity. Potential assessment methods could include a focused evaluation with two target audiences in combination with various event booths (or workshops). Event attendees would be randomly selected to either receive or not receive the brochure, then asked to complete a response card. At a later point, those who provided contact information will be contacted and asked a series of follow-up questions about awareness, knowledge, and behavior to determine if the brochure had an impact.

#### **Data Recorded**

N/A

### **EXPECTED BENEFITS**

The goal of this assessment is to determine the effectiveness of the watershed brochure in increasing knowledge and awareness in each watershed to create positive behavioral changes that will reduce bacteria. This activity will address the high priority water quality problems identified for each of the Watershed Management Areas.

### **ANALYSIS RESULTS**

An effectiveness assessment of this activity is not possible at this time because the watershed brochure has not yet been distributed.

### **CONCLUSIONS**

The City completed two watershed brochures (Tijuana and San Diego River) in FY 2010 and will continue to create brochures for the remaining watersheds in FY 2012. In FY 2011 it was determined that the watershed brochures for all 6 watersheds within the City of San Diego would need to be revised, including the already completed Tijuana and San Diego River watershed brochures. Watershed brochure revision will be completed in FY2012. Effectiveness assessments are scheduled to begin in late FY 2012. This activity will be used as a watershed education activity as required by the Municipal Permit for education activities.

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**TITLE: CITY OF SAN DIEGO STRATEGIC PLAN IMPLEMENTATION**  
**ID #: MB-3008**

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### **ACTIVITY IMPLEMENTATION**

In spring 2006, the City of San Diego (City) initiated efforts to proactively address present and anticipated Total Maximum Daily Load (TMDL), Area of Special Biological Significance (ASBS) protection, and Municipal Storm Water Permit requirements using an integrated approach to maximize resources and achieve efficiencies. The result of these efforts was the *Strategic Plan for Watershed Activity Implementation* (Strategic Plan). Its preparation involved reviewing and assessing available monitoring and source data, land use data, and current and anticipated regulatory drivers. The review and assessment were used to prioritize the water quality problems and their sources for the Watershed Management Areas (WMAs) that the City has jurisdiction in and to geospatially prioritize the City portion of each of those WMAs, using best professional judgment, for activity implementation.

The Strategic Plan uses an integrated, tiered, and phased approach with regards to activity implementation. Activities that address multiple regulations simultaneously and offer multiple environmental sustainability benefits are favored over those that do not (integration). Activities that target pollutant sources and prevent pollutant generation and release in the first place are emphasized and maximized before the implementation of more expensive structural and treatment solutions (tiering). Furthermore, the City pilots activities on a limited scale to measure their effectiveness and efficiency before it implements them on a broad scale (phasing).

The City of San Diego assisted with writing the proposed Senate Bill, provided financial resources for technical experts to assist with its development, participated in negotiations with the automobile and brake pad manufacturers, and provided lobbyist assistance to Senator Kehoe to obtain political support for the passage of the bill. Due to the automobile manufacturers renewed interest in this bill, negotiations were re-initiated to obtain support from all stakeholders, as required by the governor. The bill was rewritten multiple times and discussed by all parties before it was presented to Assembly subcommittees for review and approval. After the reporting period, SB346 was passed by both houses, signed into legislation by the governor on September 25, 2010, and incorporated into the California Health and Safety Code, Article 13.5, commencing with Section 25250.50.

The Outdoor Water Conservation Rebate Program conducted by the Public Utilities Department involved launching a city wide rebate program to assist residents and businesses conserve water by reducing the volume of irrigation and landscape runoff by incentivizing three irrigation modifications: the installation of irrigation smart controllers, micro-irrigation and turf conversion to low water use plants. Rebates are offered through a State of California grant and are available on a first come first served basis until funds are exhausted. The rebate program was implemented in FY11.

In addition, the City is of the opinion that the integration of storm water and urban runoff pollution management with other environmental efforts and infrastructure improvements is crucial for achieving efficiencies and cost savings in a period of seemingly perpetual municipal budget deficits. This integration is also crucial for obtaining the support of storm water and urban

runoff pollution management efforts of the public. Development of the Strategic Plan included the formulation of a list of activities to implement during Phase I. These activities have been integrated into the various Watershed Urban Runoff Management Programs (WURMPs) that the City implements in conjunction with other local jurisdictions. Each fiscal year, the City updates its list of activities to reflect new data, schedule changes, and staffing and budgetary considerations. Many of these activities are reported as watershed water quality and education activities in the various WURMPs. However, the City has a list of project types and sources it plans to implement/target with no specific information. Because these are so conceptual in nature, the City does not report on them as specific activities. Those that are concepts not yet into development but planned for initiation within the next few years are listed in the table below.

| Activity Description   | Activity Type Classification                       | Type          | Class                        | Primary Target Pollutant                      | Status  |
|--|--|---------------|------------------------------|---|---|
| Outdoor Water Conservation Rebate Program  | Smart Irrigation Control Incentive Program         | Water Quality | Non-structural               | Pesticides, bacteria, nutrients, heavy metals | Planning, implementation and assessment completion anticipated in FY2013. WMA: TBD. |
| County Operations Center Green Roof Project Collaboration                            | Roof Rain Harvesting                               | Water Quality | Structural                   | Targeted Multiple Pollutants                  | Pre-planning  |
| Erosion & Sediment Control Detention Basin   | Erosion/Sediment Control BMP                       | Water Quality | Structural                   | Sediment, TSS, Metals, Pesticides & Trash     | Pre-planning  |
| Green Roof Project   | Roof Rain Harvesting                               | Water Quality | Structural                   | Targeted Multiple Pollutants                  | Pre-planning  |
| Basin Plan Triennial Review  | N/A  | Monitoring    | Non-structural               | N/A   | As needed   |
| Targeted Mobile Hazardous Household Waste Collection Centers                         | Hazardous Waste Collection                         | Water Quality | Non-structural               | Metals, Trash, Oil & Grease                   | Pre-planning  |
| Residential Rain Barrel, Downspout Disconnect, and Xeriscaping Incentive Program (1) | Downspout Disconnect; Rain Barrel Incentives       | Water Quality | Non-structural               | Targeted Multiple Pollutants                  | Pre-planning  |
| Residential Rain Barrel, Downspout Disconnect, and Xeriscaping Incentive Program (2) | Downspout Disconnect; Rain Barrel Incentives       | Water Quality | Non-structural               | Targeted Multiple Pollutants                  | Pre-planning  |
| Rain Garden, Xeriscaping, and Landscape Filtration (1)                               | Rain Garden, Xeriscaping, and Landscape Filtration | Water Quality | Structural or Non-Structural | Targeted Multiple Pollutants                  | Pre-planning  |
| Rain Garden, Xeriscaping, and Landscape Filtration (2)                               | Rain Garden, Xeriscaping, and Landscape Filtration | Water Quality | Structural or Non-Structural | Targeted Multiple Pollutants                  | Pre-planning  |
| Sediment Basin Endowment Fund (1)  | Sediment Basin Endowment                           | Water Quality | Non-structural               | Sediment                                      | Pre-planning  |

| Activity Description  | Activity Type Classification         | Type          | Class                        | Primary Target Pollutant     | Status                                       |
|---|--------------------------------------|---------------|------------------------------|------------------------------|--|
| Sediment Basin Endowment Fund (2)                                       | Sediment Basin Endowment             | Water Quality | Non-structural               | Sediment                     | Pre-planning                                 |
| Commercial Pest Control   | Product Sub                          | Education     | Non-Structural               | Pesticides                   | Planning                                     |
| Residential Pesticide Management  | Product Sub                          | Education     | Non-Structural               | Pesticides                   | In progress through JURMP education program. |
| LID Regulatory Barriers and Solutions                                   | Municipal Code Modification          | Water Quality | Non-structural               | Targeted Multiple Pollutants | Pre-planning                                 |
| Roof Rain Harvesting/Incentives   | Roof Rain Harvesting                 | Water Quality | Structural or Non-structural | Targeted Multiple Pollutants | Pre-planning                                 |
| Targeted Behavioral Training (staff)                                    | Targeted Behavioral Training (staff) | Education     | Non-structural               | Specific to Activity         | Pre-planning                                 |
| Rose Creek Homeless Reduction Program Sponsorship                       | Homeless Encampment Removal          | Water Quality | Non-structural               | Bacteria & Trash             | Pre-planning                                 |
| Enforcement Referrals   | Enforcement Referrals                | Water Quality | Non-structural               | Specific to Activity         | Pre-planning                                 |
| Infiltration Vault/Pit Installation (1)                                 | Infiltration Vault/Pit               | Water Quality | Structural                   | Targeted Multiple Pollutants | Pre-planning                                 |
| Infiltration Vault/Pit Installation (2)                                 | Infiltration Vault/Pit               | Water Quality | Structural                   | Targeted Multiple Pollutants | Pre-planning                                 |
| Small-Scale Storm Flow Storage and Multi-Pollutant Treatment System (1) | Small Scale Treatment Train          | Water Quality | Structural                   | Targeted Multiple Pollutants | Pre-planning                                 |
| Small-Scale Storm Flow Storage and Multi-Pollutant Treatment System (2) | Small Scale Treatment Train          | Water Quality | Structural                   | Targeted Multiple Pollutants | Pre-planning                                 |
| Small-Scale Storm Flow Storage and Multi-Pollutant Treatment System (3) | Small Scale Treatment Train          | Water Quality | Structural                   | Targeted Multiple Pollutants | Pre-planning                                 |
| Large Scale Storm Flow Storage and Multi-Pollutant Treatment System (1) | Large Scale Treatment Train          | Water Quality | Structural                   | Targeted Multiple Pollutants | Pre-planning                                 |
| Large Scale Storm Flow Storage and Multi-Pollutant Treatment System (2) | Large Scale Treatment Train          | Water Quality | Structural                   | Targeted Multiple Pollutants | Pre-planning                                 |
| Large Scale Storm Flow Storage and Multi-Pollutant Treatment System (3) | Large Scale Treatment Train          | Water Quality | Structural                   | Targeted Multiple Pollutants | Pre-planning                                 |
| Hydromodification BMP (1)   | Hydro mod BMP                        | Water Quality | Structural                   | Sediment & TSS               | Pre-planning                                 |
| Hydromodification BMP (2)   | Hydro mod BMP                        | Water Quality | Structural                   | Sediment & TSS               | Pre-planning                                 |
| Hydromodification BMP (3)   | Hydro mod BMP                        | Water Quality | Structural                   | Sediment & TSS               | Pre-planning                                 |
| Erosion/Sediment Control BMP (2)  | Erosion/Sediment Control BMP         | Water Quality | Structural                   | Sediment & TSS               | Pre-planning                                 |
| Home Auto Activities (Metals) Outreach                                  | Outreach                             | Education     | Non-structural               | Metals, Oil & Grease & PAHs  | In progress through JURMP education program. |
| Commercial Landscaping  | Targeted                             | Water         | Non-                         | Nutrients &                  | Pre-planning                                 |

| <b>Activity Description</b>  | <b>Activity Type Classification</b> | <b>Type</b>   | <b>Class</b>                 | <b>Primary Target Pollutant</b>               | <b>Status</b> |
|--|-------------------------------------|---------------|------------------------------|---|---------------|
| Targeted Enforcement   | Enforcement                         | Quality       | structural                   | Pesticides                                    |               |
| Targeting Marinas and Boat Repair as a Pollutant Source                                      | Targeted Source                     | Water Quality | Structural or Non-Structural | Metals & Bacteria                             | Pre-planning  |
| Construction Contractors - Home and Commercial Improvements Inspection Generated Enforcement | Inspection Generated Enforcement    | Water Quality | Non-structural               | Metals, Sediment, Gross Solids & Oil & Grease | Pre-planning  |

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL
- Area of Special Biological Significance Nos. 29 and 31

Note: In addition to current and pending TMDLs, the Strategic Plan reviewed the Clean Water Act 303(d) list of impaired water bodies for the San Diego region and used the information to help prioritize the water quality problems, pollutant sources, and areas of the City to target for activity implementation.

### **TIME SCHEDULE FOR IMPLEMENTATION**

Each activity has its own specific implementation schedule. However, implementation of Phase I of the Strategic Plan (the piloting stage before implementation on a broader scale) is anticipated to occur from FY 2008 through FY 2013.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Gross Pollutants
- Metals
- Nutrients
- Oil & Grease
- Organics
- Pesticides
- Sediment
- Trash



### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Subsequent to the adoption of the Municipal Storm Water Permit (Order No. R9-2007-0001) in January 2007, the Copermittees developed a Model Watershed Strategy to help guide their planning, implementation, and assessment efforts in the various WMAs. The Model Watershed Strategy assists the Copermittees in developing a Collective Watershed Strategy for each WMA. Application of the Model Watershed Strategy results in prioritizing areas within each WMA for activity implementation; selecting and prioritizing appropriate watershed activities, including monitoring and pollutant source identification studies, for each of the prioritized areas; and identifying data gaps with regards to monitoring and pollutant sources, which need to be filled to enable more refined future management decisions.

Although developed independently of each other, the City Strategic Plan and the Copermittees Model Watershed Strategy share the approach of reviewing the best available data (e.g., water quality and pollutant source data) and analyzing them geospatially to make management decisions regarding: (1) water quality problems to target and activities to implement; and (2) geospatial prioritization of the WMAs for focused activity implementation.

Note that the Strategic Plan is primarily an activity implementation approach. However, the conclusions that it makes regarding priority water quality problems are in harmony with the conclusions made in Section 3, Water Quality Assessment, of this WURMP annual report.

### **EFFECTIVENESS MEASUREMENTS**

Each activity will be assessed independently, and programmatic assessment will occur annually in Section 4 of the WURMP annual report.

Assessment of the Strategic Plan is a long-term effort and will involve tracking the City progress on piloting activities over the next five years to be able to make conclusions on how to optimize the efficiency of its storm water program to meet water quality goals and regulations.

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**TITLE: LA JOLLA ASBS 201-2011 REGIONAL COMPLIANCE**  
**MONITORING**  
**ID #: MB-3009**

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### **ACTIVITY IMPLEMENTATION**

The objective of this project was to address the following study questions:

- 1) What are the conditions of storm water effluent in the storm drain prior to being discharged to the ocean receiving waters?
- 2) Are short-duration exposures to contaminants during storm events toxic to species living within the rocky intertidal zone?
- 3) Do sediment contaminant concentrations differ between ASBS sites adjacent to storm water discharges and reference sites?
- 4) Do the rocky intertidal biological communities differ between sites that are influenced by storm water runoff and those that are not?

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL
- La Jolla Shores ASBS Regional Compliance Monitoring

### **TIME SCHEDULE FOR IMPLEMENTATION**

This study was designed to be in compliance with the Committee's Regional ASBS Work Plan with additional monitoring and assessment activities specific to the needs of the City in accordance with the *Strategic Plan for Watershed Activity Implementation*.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Metals
- Organics
- Pesticides

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Strategic Plan represents the City's Storm Water Division's implementation strategy for watershed activities within the City's jurisdictional boundaries from 2007 through 2012. Among the prioritized watershed activities identified in The Strategic Plan, eight projects pertained directly to the protection and enhancement of beneficial uses for ASBS 29 and ASBS 31. These projects included dry weather flow diversion, runoff reduction, ecosystem assessment, and street sweeping. The City recently received a Proposition 84 Grant to partially fund these projects.

## **EFFECTIVENESS MEASUREMENTS**

Effectiveness of this activity is not being assessed as this not an implementation or education activity. This study is filling pollutant source data gaps as identified above. Future activities implemented in response to the results of the monitoring study will be reported as separate activities.

## **ANALYSIS RESULTS**

- 1) “End of pipe” storm drain effluent samples (prior to mixing with the ocean receiving waters) were collected during a storm event from each of the five major storm drain outfalls that drain to ASBS 29. Most metal concentrations were below California Ocean Plan water quality objectives (WQOs) (as required in the Special Protections), except for those of total zinc and copper. Organophosphate pesticides were not detected, but synthetic pyrethroid concentrations were high, exceeding LC50 values by two to three orders of magnitude in some cases. Thus, reductions in the concentrations of some metals and pyrethroids may be required in the future to meet the requirements of the Special Protections.
- 2) The results of the pollutograph monitoring indicate that concentrations of some metals exceeded Ocean Plan WQOs and synthetic pyrethroid concentrations exceeded values in the literature shown to be toxic to marine organisms, by as much as three orders of magnitude. Elevated concentrations of these constituents were measured in the storm water effluent taken directly from the storm drain as well as in the tide pools in the ocean receiving waters. Toxicity evaluations indicated that storm water effluent was toxic to native marine species at concentrations observed in the receiving waters. However, further assessment suggested that the freshwater associated with storm water runoff may be the predominant source of toxicity observed in this study. Further assessment is needed to understand the impacts of storm water runoff on the beneficial uses of the ASBS.
- 3) Surficial sediment samples were collected from the upper and lower intertidal zone in front of each of the five major storm drain outfalls that discharge to ASBS 29 following a storm event. Samples were analyzed for grain size and a suite of constituents. Chemistry results indicated that sediments had low concentrations of the constituents analyzed. Concentrations of PCBs, OP pesticides, pyrethroids, and PAHs were all less than reporting limits and metal concentrations were one or more orders of magnitude below ER-L (effects range low) values. The grain sizes of all upper and lower intertidal sediment samples consisted of greater than 95% sand and gravel. The results suggest that contaminants associated with storm water runoff are not accumulating in the intertidal sediments of the ASBS. Additional data will be necessary to confirm if these results are consistent over varying spatial and temporal gradients.
- 4) Surveys were conducted to characterize the biological communities in the rocky intertidal habitats at the storm drain-influenced site (SDL-186 within ASBS 29) and two sites that are not influenced by storm drains. Results revealed that each site was significantly different from each other using numerous parameters. Biodiversity of macrophytes (macroscopic algae) and macroinvertebrates was lowest at the ASBS site while patterns were mixed for meiofaunal (small, macroscopic invertebrates that live within the sediments) diversity, with diversity sometimes being higher at the ASBS site. Multi-variate statistical analyses revealed that the ASBS site was clearly differentiated from the

other two sites, but the sites may differ due to several factors, not just the presence of storm drain runoff. Despite some differences, evidence of obvious and consistent storm water impacts at the SDL-186 site relative to the reference sites is relatively weak. However, differences among sites warrant possible future examinations in a more robust manner using multiple impacted and non-impact sites and concentrating some sampling on non-turf habitats, such as intertidal tidepools.

## **CONCLUSIONS**

This Phase I Source Study provides the following benefits to the City:

- 1) Supports ASBS compliance monitoring requirements for the La Jolla ASBS.
- 2) Supports regional and jurisdictional management plans.
- 3) Identifies constituents during storm events that may be toxic to the resident biological community and may influence community level parameters, such as abundance and diversity.

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**TITLE:                    BIOASSESSMENT MONITORING OF THE TECOLOTE CREEK  
WATERSHED**  
**ID #:                    MB-3010**

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### **ACTIVITY IMPLEMENTATION**

Historical bioassessment studies in Tecolote Creek have shown consistently impaired benthic macro-invertebrate (BMI) communities and there are several constituents on the State Water Resources Control Board (State Board) 303(d) list of impaired waterbodies.

Due to budget constraints, this project was put on hold. The initial study was completed in FY2010 and provides a strong basis for a focused follow-up study to provide specific recommendations for TMDL implementation planning. Future studies will be implemented as funding is available.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Indicator Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Due to budget constraints, this project was put on hold. Initial study was completed in 2010. future studies will be implemented as funding is available.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

### **OTHER PARTICIPATING COPERMITTEES**

N/A

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Metals
- Nutrients

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay and La Jolla WMA identify metals, nutrients, and bacteria as high priority water quality problems throughout Tecolote Creek and the Mission Bay and La Jolla WMA.

### **EFFECTIVENESS MEASUREMENTS**

Due to the nature of this monitoring study, effectiveness is not being measured.

## **EXPECTED BENEFITS**

Objectives, findings, and recommendations based on bioassessment monitoring conducted in Tecolote Creek are summarized below.

### **Objectives**

- 1) Comprehensively document biological conditions and community structure of BMI throughout the Tecolote Creek Watershed and its tributaries.
- 2) Assess possible stressors to the BMI communities by analyzing the physical habitat conditions as well as water quality constituents that could prevent the establishment of sensitive BMI taxa and non-impaired BMI communities.
- 3) Determine the most important limiting factors for achieving potential biological objectives.

## **ANALYSIS RESULTS**

- 1) Analysis of seven bioassessment sites in the Tecolote Watershed indicated that there was biological impairment throughout the watershed.
- 2) Physical habitat ratings were good to very good for BMI colonization. TDS (Total Dissolved Solids) exceeded the water quality objectives (as described in the Basin Plan) throughout the watershed. Specific conductivity and salinity were also very high at six of the seven sites (relative to reference conditions in San Diego County).
- 3) The most important limiting factors for achieving potential biological objectives were high levels of TDS, specific conductivity, and salinity.

## **CONCLUSIONS**

- 1) Determine the source(s) of elevated TDS specific conductivity and salinity in the Tecolote Watershed.
- 2) Assess the potential efforts and costs required for addressing water quality limitations which are impacting the biological integrity in the creek.

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**TITLE:                   TECOLOTE CREEK MICROBIAL SOURCE TRACKING STUDY**  
**ID #:                     MB-3011**

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### **ACTIVITY IMPLEMENTATION**

This study was conducted from 2007 through 2010 in three phases throughout the watershed to investigate and identify bacterial sources, origins, and loads in the Tecolote Creek Watershed and to assess and characterize specific priority activity contributions. The results provide background for the City of San Diego (City) to address bacterial load and concentration reduction strategies to comply with the *Total Maximum Daily Loads (TMDLs) for Indicator Bacteria, Bacterial Project I - Twenty Beaches and Creeks in San Diego Region, Including Tecolote Creek* (Bacterial Project I TMDL) recently adopted by the San Diego Regional Water Quality Control Board (Regional Board).

The Tecolote Creek Microbial Source Tracking Study aimed to identify sources of specific bacterial pollutants in the watershed. Objectives and findings are summarized below.

#### Objectives

- 1) Gather further information for the refinement of the Bacterial Project I TMDL and State Board §303(d) list documentation.
- 2) Verify Priority Sectors identified in the Strategic Plan through characterization of bacterial loadings to Tecolote Creek Watershed by targeting primary sources of high bacterial loading (e.g., anthropogenic and non-anthropogenic sources).
- 3) Determine the presence or absence of human contamination within the watershed and pinpoint any sources of human contamination.
- 4) Determine the relative contribution and origin of bacterial regrowth to bacterial loading in the creek during wet weather and dry weather.
- 5) Further develop bacterial load and concentration reduction strategies for Tecolote Creek based on the results of study elements designed around the four previous objectives.

Due to budget constraints, this project was put on hold. When funds become available the data collected in Tecolote Creek will be used to develop an implementation planning framework. Once the framework is completed, the framework will be considered for use as a management tool in developing a comprehensive load reduction plan for the Bacteria Project I TMDL. The framework may also be considered as a guidance document for developing implementation plans for other TMDLs with similar characteristics.

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Indicator Bacteria TMDL

### **TIME SCHEDULE FOR IMPLEMENTATION**

Due to budget constraints, this project was put on hold.

### **LEAD WATERSHED COPERMITTEE**

- City of San Diego

**OTHER PARTICIPATING COPERMITTEES**

N/A

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria/Pathogens
- Metals
- Nutrients

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Mission Bay and La Jolla WMA identify bacteria as a high priority water quality problem throughout the Mission Bay and La Jolla WMA, and recommend implementing specific management and Best Management Practices (BMPs) strategies to reduce the identified sources.

**EFFECTIVENESS MEASUREMENTS**

Due to the nature of this monitoring study, effectiveness is not being measured.

**EXPECTED BENEFITS**

The data collected during the three phases of the investigation will be compiled with all available historical data for submittal to the Regional Board for inclusion in the State Board §303(d)-list database. This submittal will ensure that revisions to the State Board §303(d) list will be made using the most recent and relevant data available.

**ANALYSIS RESULTS**

- 1) An evaluation of all historical data indicated that a number of State Board §303(d)-listed pollutants could be removed from the list based on the number of exceedances observed. The results indicate that dissolved cadmium, copper, lead, and zinc are eligible for delisting from the State Board §303(d) list. However total selenium, bacteria, nutrients, and turbidity did not meet delisting requirements.
- 2) Sector prioritization—undertaken both through the Baseline Long-Term Effectiveness Assessment and Strategic Planning process—suggested that Sectors 1 and 2 presented the highest threat to water quality with a higher presence of potential pollutant sources through specific land use activities. Assessments of pollutant loads during both dry weather and wet weather indicated that these two sectors discharge higher loads of pollutants when compared with Sectors 3 and 4. During dry weather, Sector 1 was found to contribute the highest loads of copper, zinc, and total dissolved solids (TDS). During wet weather, Sector 2 was found to contribute some of the highest loads of bacteria, zinc, lead, and total suspended solids (TSS). Management of land use activities in Sectors 1 and 2 should be the focus of any comprehensive load reduction strategies.

Wet weather bacteria loads from individual land uses indicated that there were no significant differences between different land uses with flows merging and combining



throughout drainage areas. There was some indication that higher loads were attributable to transportation corridors, commercial areas, and industrial land uses.

Dry weather bacteria loads were higher in residential and commercial areas with specific activities identified, particularly poorly maintained dumpsters and catch basins. Over-irrigation was a key transport mechanism that was prominent in commercial and industrial areas.

- 3) A comprehensive assessment of water quality throughout Tecolote Creek was undertaken to assess the presence of human fecal contamination. The assessment was performed using human-specific *Bacteroides* and quantitative polymerase chain reaction (Q-PCR). During dry weather, five positive samples were obtained. Each follow-up investigation failed to locate a point source and in every instance there was evidence of transient human activity. During wet weather, only one sample (of a total of 37 samples collected during nine storms) was found to be positive for *Bacteroides*. This sample was collected during the early phase of the storm flows in an area known to be a transient area.
- 4) A number of investigations were undertaken in Tecolote Creek to assess the presence of environmental species of fecal indicator bacteria. Ponds were not found to be a significant reservoir for environmental indicator species. However, sediments and biofilms within the creek and MS4 system were found to be significant bacterial reservoirs. Biofilms on the walls of the MS4 system in particular were found to grow rapidly and contain high numbers of enterococci. Speciation of these enterococci determined that the origins were most likely environmental rather than fecal. Further investigation determined that the storm water, with high numbers of enterococci of fecal origin, was the primary inoculation mechanism, and that biofilms matured rapidly into complex communities with a variety of species present. The high flows generated during wet weather caused significant biofilm sloughing. The impact of biofilms on wet weather loads of indicator bacteria into receiving waters appeared to be significant.
- 5) Load and concentration reduction strategies are currently being developed through the Tecolote Creek Implementation Framework.

## **CONCLUSIONS**

Once the framework is completed, the framework will be considered for use as a management tool in developing a comprehensive load reduction plan for the Bacteria Project I TMDL. The framework may also be considered as a guidance document for developing implementation plans for other TMDLs with similar characteristics.