FINAL REPORT
FOR THE
ASHLAND AVENUE
LOW-FLOW DIVERSION PROJECT

Clean Beaches Initiative Project No. 7401
Agreement Number: 02-238-550-0

December 2007

Prepared for

State Water Resources Control Board

Prepared By

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

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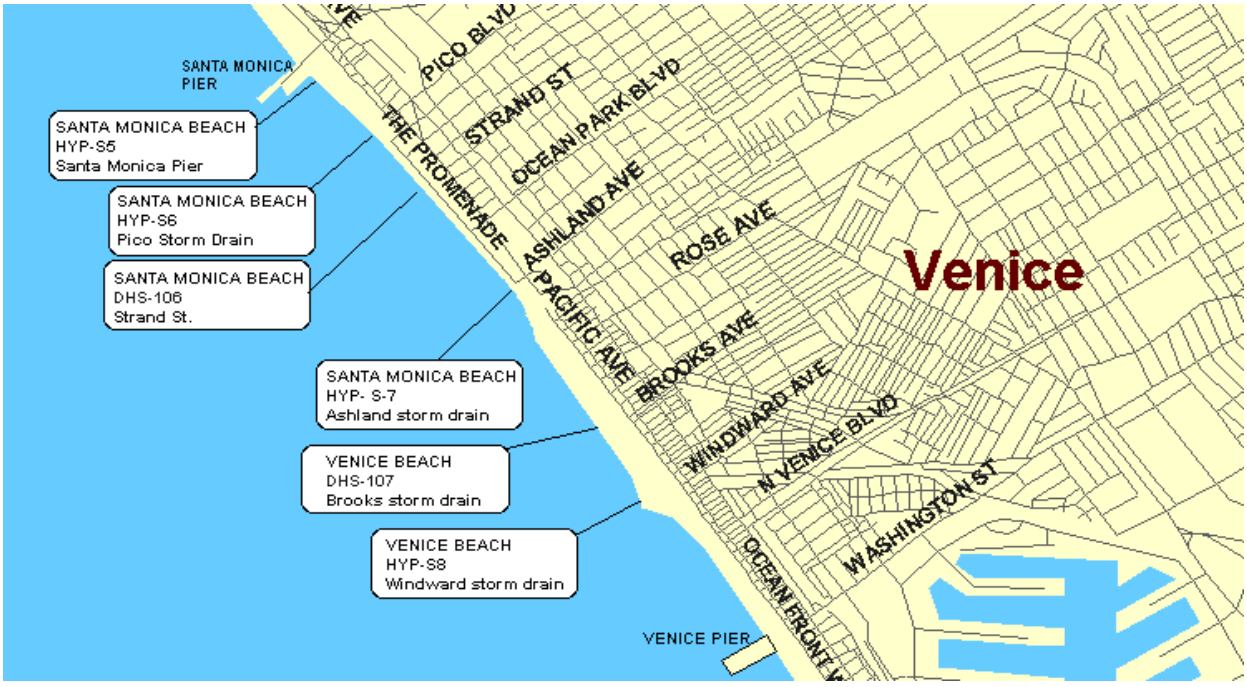
1. Introduction

Problem Statement:

A low flow diversion (LFD) system was constructed at Ashland Avenue to divert dry weather runoff away from the beach and into the sanitary sewer. Flow from the dry weather runoff may contribute to elevated bacterial levels in Santa Monica Bay, and this project was undertaken in an effort to reduce levels of bacteria in the bay in order to be in compliance with the Santa Monica Bay Beaches Bacteria TMDL. A map of the nearby shoreline Monitoring Sites for the Ashland Avenue LFD per Los Angeles County Department of Public Health is below.



This low flow diversion project was funded by the Clean Beaches Initiative (Proposition 40). Post construction bacterial monitoring has been conducted and the results are presented in this report. An assessment of the effectiveness of this project in diverting bacteria to the sanitary sewer, the changes in the quality of the receiving waters near the beach and of lessons learned from the genesis, construction and maintenance of the project are also presented. Additional project background can be found in the Monitoring Plan, Project Questionnaire, and Grant Agreement in Appendix D. Additional photos and maps for the project can also be found in Appendix D.

Item	DESCRIPTION	DUE DATE	COMPLETED DATE
EXHIBIT A - SCOPE OF WORK			
1.0	QUALITY ASSURANCE PROJECT PLAN and MONITORING PLAN		
1.1	Quality Assurance Project Plan	May 2005	July 2006
1.2	Monitoring Plan	May 2005	April 2007
2.0	WORK TO BE PERFORMED BY GRANTEE		
2.1.3	Final Plans and Specifications	February 2005	November 2005
2.1.4	Cost Estimate	February 2005	November 2005
2.2	Board of Supervisors Approval of Plans and Specifications	June 2005	November 2005
2.3.5	Geotechnical and Geologic Investigations Report	September 2005	November 2005
2.4.1	Notice to Proceed	July 2005	November 2005
2.4.3	Photo Documentation of Project Construction	Continuous	November 2005
2.4.4	Board of Supervisors Acceptance of Project	April 2006	November 2006
2.6	REPORTING		
2.6.1	Annual Progress Summary	September of Each Year	September 2005,2006,2007
2.6.2	Draft Project Report	September 2007	September 2007
2.6.3	Final Project Report	December 2007	December 2007
EXHIBIT B - INVOICING, BUDGET DETAIL AND REPORTING PROVISIONS			
5.0	STANDARD REQUIREMENTS CERTIFICATION FORM	(as needed)	November 2005
6.0	REPORTS		
6.1	Progress Reports by the twentieth (20th) of the month following the end of the calendar quarter(March, June, September, and December)	Quarterly	October 2007
6.2	Expenditure/Invoice Projections	Quarterly	October 2007
6.3	Grant Summary Form	Day 90	November 2005
6.4	Natural Resource Projects Inventory Project Survey Form	Before Final Invoice	
EXHIBIT C - SWRCB GENERAL CONDITIONS			
#6	Copy of Final CEQA/NEPA Documentation	June 2004	January 2004
#22	Signed Cover Sheets for All Permits	June 2004	November 2005
EXHIBIT D - GRANT PROGRAM TERMS & CONDITIONS			
#5	Monitoring and Reporting Plan	May 2005	April 2007

Table 1)Table of Items for Review

2. Data

Samples were collected and analyzed in compliance with the approved Final Project Report. Data is presented below in graphical form. Tabulated monitoring data, Chains of Custody and the Field Data Sheet can be found in Appendices A and B.

Flow data was collected during monitoring. An estimate of the total volume of water diverted to the sanitary sewer and an approximate bacterial load is presented below.

Beach Mile Days data was downloaded from the Beachwatch Website (http://beachwatch.waterboards.ca.gov) and analyzed to determine trends in shoreline water quality.

Summer Beach Report Cards were downloaded from Heal the Bay (www.healthebay.org) and the grades for Ashland Avenue and the two adjacent monitoring sites are tabulated below.

2.1) Monitoring Data

Figures 1 through 3 show the results of bacterial sampling at Ashland Avenue upstream of the low-flow diversion.

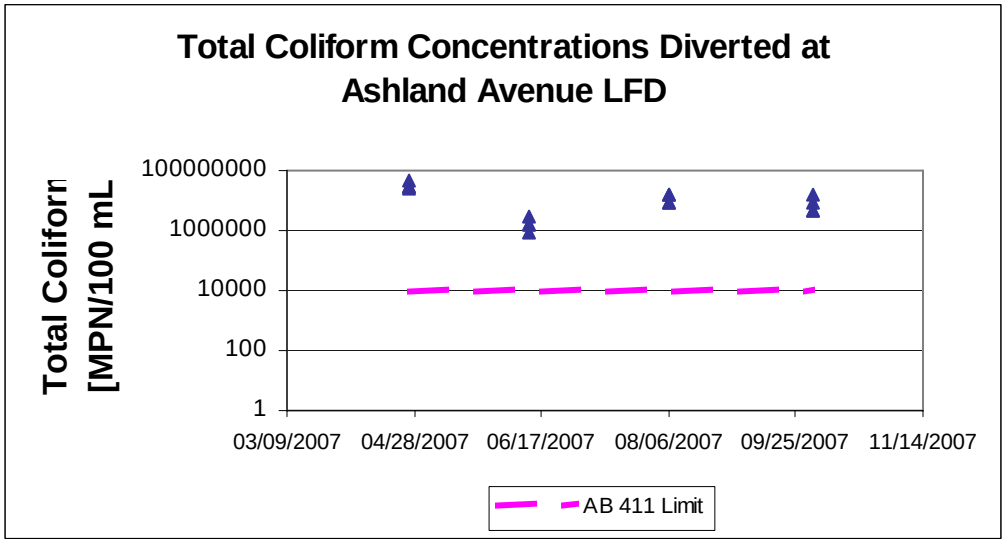


Figure 1) Total Coliform Concentrations Diverted to Sewer at Ashland Avenue

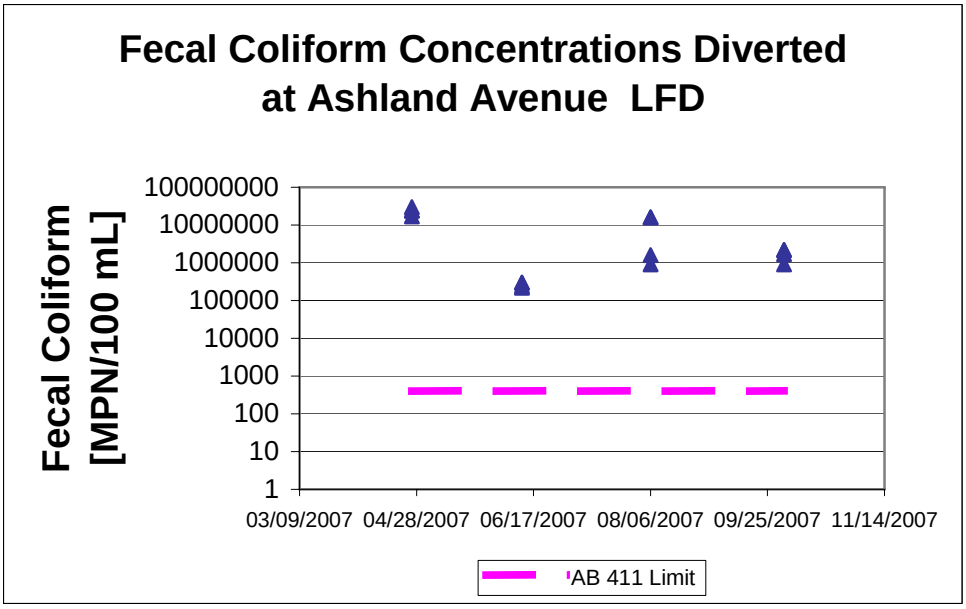


Figure 2) Fecal Coliform Concentrations Diverted to Sewer at Ashland Avenue

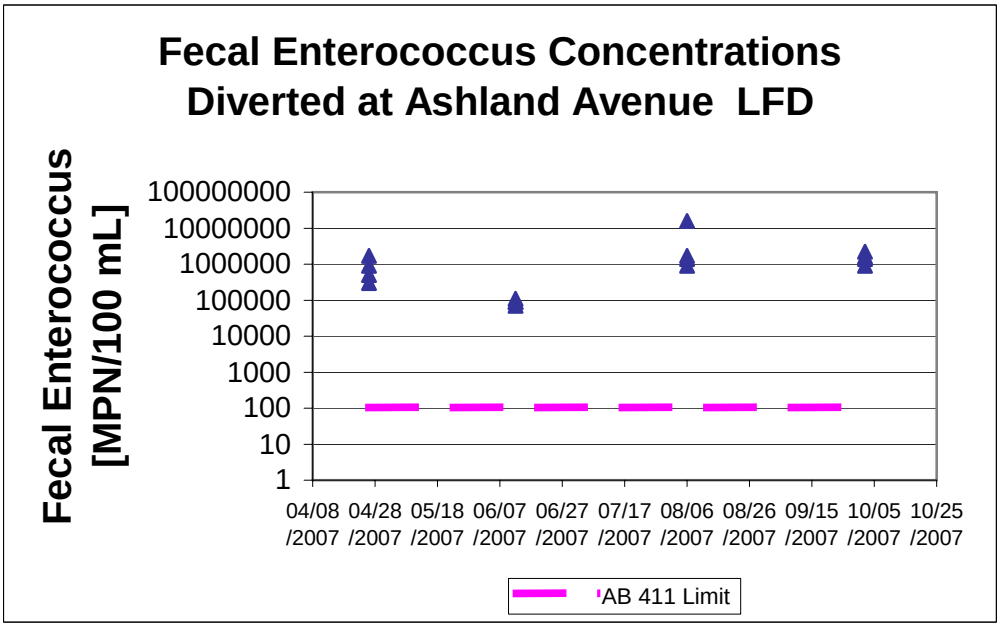


Figure 3) Fecal Enterococcus Concentrations Diverted to Sewer at Ashland Avenue

Figures 1 through 3 show the results of bacterial monitoring conducted during the summer of 2007. The water diverted to the sanitatary sewer contains bacteria concentrations many orders of magnitude greater than the AB 411 limits for single samples. Geometric averages of bacteria diverted to the sewer can be found below in Table 2.

Monitoring results taken at the same time are generally within an order of magnitude of each other, but do exhibit some variation. It may be helpful for future monitoring efforts to collect multiple samples in order to minimize exceedences and/or the risk of missing an exceedence due to natural variation in the concentrations. In this manner the health of the beach going public and other portions of the environment can be protected most economically.

Tabulated data can be found in Appendix A.

2.2) Flow Data and Estimated Loading

A little more than 6 hundred thousand gallons of flow was diverted to the sanitary sewer at the Ashland Avenue low-flow diversion. Visual inspections of flow bypass were made during 3 of the 4 sampling events. Once flow bypassed the diversion, once the drain was sanded in, and once no entry was made regarding bypass flow. The layout of the diversion berm and trash wells at each diversion can affect the ease with which bypass flow is inspected. Sanded in outlets pose a particular challenge since it is impossible to tell if bacteria laden water continues to leach through the sand or not. Table 1 shows the geometric average concentrations of the diverted bacteria and an estimated diverted load. Bacteria can exhibit rapid changes in population size, so these estimated loads should not be relied upon when determining bacterial concentrations in receiving waters. Given the high concentrations of bacteria diverted, it is likely that removing or reducing this storm drain's contribution to the beaches bacteria load helped improve the water quality in the Santa Monica Bay.

Geometric Bacteria Concentrations (MPN/100 mL)		Flow (Gallons)	Flow (mL)	Estimated Bacteria Loads (MPN)
Total Coliform	8,380,578		2.3E+09	2.0E+14
Fecal Coliform	2,578,179		2.3E+09	6.0E+13
Enterococcus	681,712	616,190	2.3E+09	1.6E+13

Table 2) Flow Volume and Estimated Bacterial Loads to Sanitary Sewer

2.3) Beach Mile Days

Downloading Beach Mile Day data was attempted from the BeachWatch website (http://beachwater.waterboards.ca.gov). When this system became overloaded, the data was requested directly from the site administrator. A Beach Mile Day is a measure of shoreline water quality that takes into account both the geographical and temporal extent of water quality issues. Tabulated results for the shoreline monitoring stations located at the outfall of Ashland Avenue and the nearest stations on either side are presented below in Table 3.

Year	BMD (all year)	BMD (AB 411 year April - October)	BMD (all year)	BMD (AB 411 year April - October)
	Strand Street		Ashland storm drain	
2004	1.1	0.7	3.08	1.43
2005	0.65	0.2	3.25	0.31
2006	0.65	0.35	1.48	1.15
2007	0	0	0.33	0
	Brooks Ave.		Montana Ave.	
2003	17.6	6.52	27.31	17.96
2004	1.87	1.54	2.2	1.82
2005	0.11	0.11	0.7	0.2
2006	0.88	0.22	1.45	1.35
2007	0.32	0.1	0.4	0.1

Table 3) Beach Mile Days

An analysis of the Beach Mile Days for these stations indicates that water quality in the bay generally improved over the past four or five years. Although factors such as seasonal rainfall can play a factor, it appears that the installation of the Ashland Avenue Low flow diversion helped to improve bacterial water quality near the storm drain outlet and possibly at nearby beaches.

2.4) Summer Beach Report Card Grades

Another widely used and publicly available measure of shoreline water quality is Heal the Bay's Report Card. This Low-Flow Diversion is designed to operate only during dry weather between April 15 and October 15, so only the Summer Dry scores are presented below in Table 4 for the Ashland Avenue Storm Drain and the stations

immediately adjacent. Appendix C contains the weekly Beach Report Cards for these drains.

Heal The Bay Summer Dry Weather Grades			
Year	Santa Monica Beach at Strand St.	Ocean Park at Ashland Avenue Drain	Venice Beach at Rose Avenue Drain
Station	Grades	Grades	Grades
2007	A+	A	A
2006	A	A	A+
2005	A+	A	ns
2004	A	A+	ns
2003	A	A	ns

Table 4) Heal The Bay Summer Dry Beach Report Card Grades

An analysis of the grades indicates that these beaches generally have good water quality during dry weather in the summer for the years which data is available. While no single project can be determined to be the sole factor in protecting the quality of water at the beach, the Ashland Avenue Low Flow diversion seems to be helping to protect water quality at the beach. Heal The Bay did not sample at Venice Beach at Rose Avenue Drain from 2003 to 2005, as indicated by the ns.

2.5) Shoreline Bacteria Monitoring

In accordance with Assembly Bill 411 (AB411) and the Santa Monica Bay Beaches Bacterial TMDL, bacteria monitoring is conducted along the shore of Santa Monica Bay. These monitoring results are used to determine if beaches should be posted or closed to protect the health of the public depending on the concentrations of fecal indicator bacteria. This project diverts low flows away from the bay, but if it didn't, the water

would enter the bay at the Ashland Avenue Drain, SMB-3-5. Results for this year's AB411 season are presented graphically below in Figures 4 to 6. Tabulated Data can be found in Appendix E.

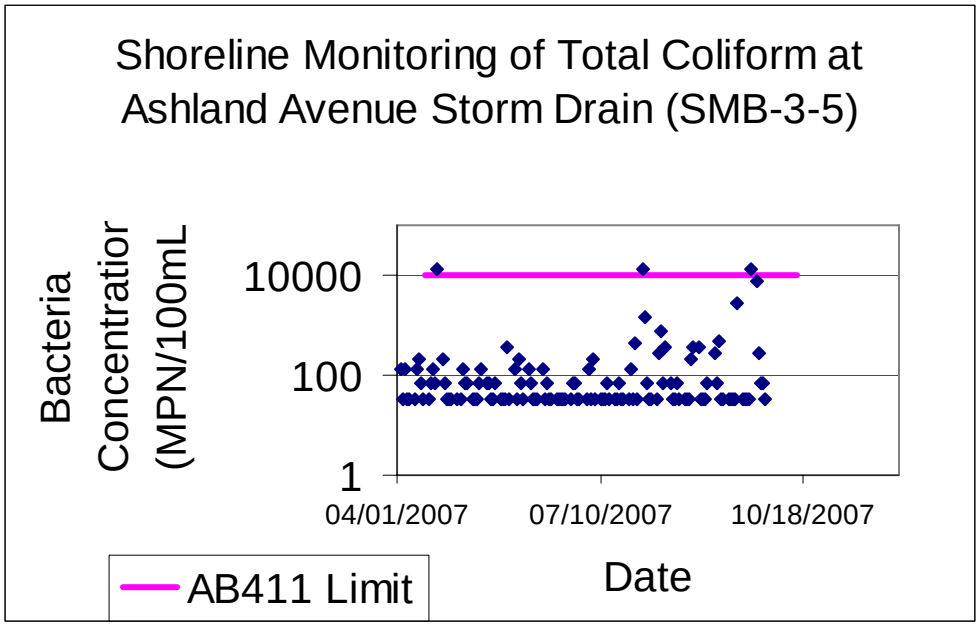


Figure 4) Shoreline Monitoring of Total Coliform at Ashland Avenue Storm Drain

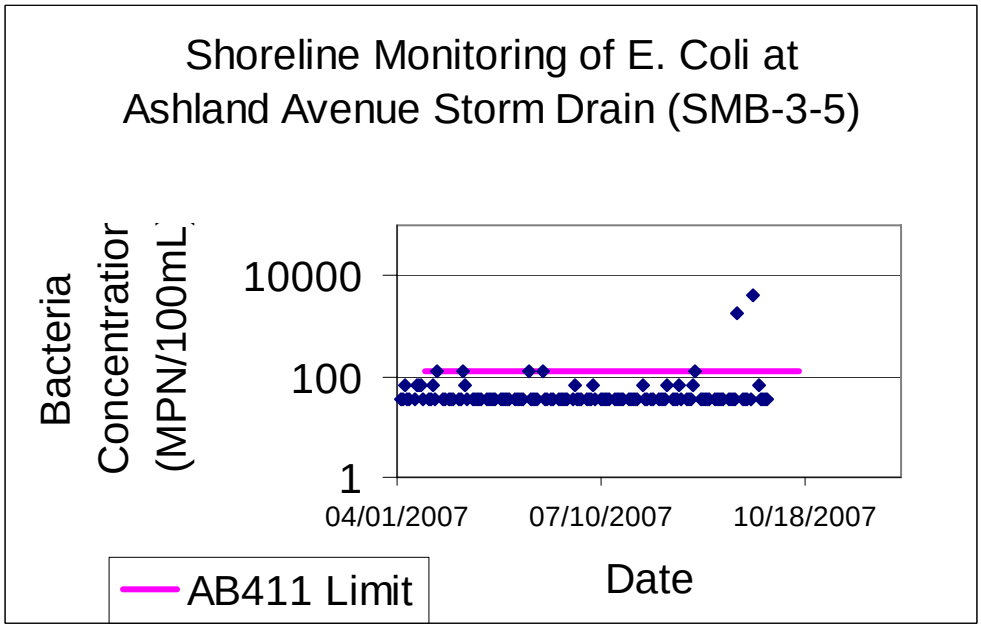


Figure 5) Shoreline Monitoring of E. Coli at Ashland Avenue Storm Drain

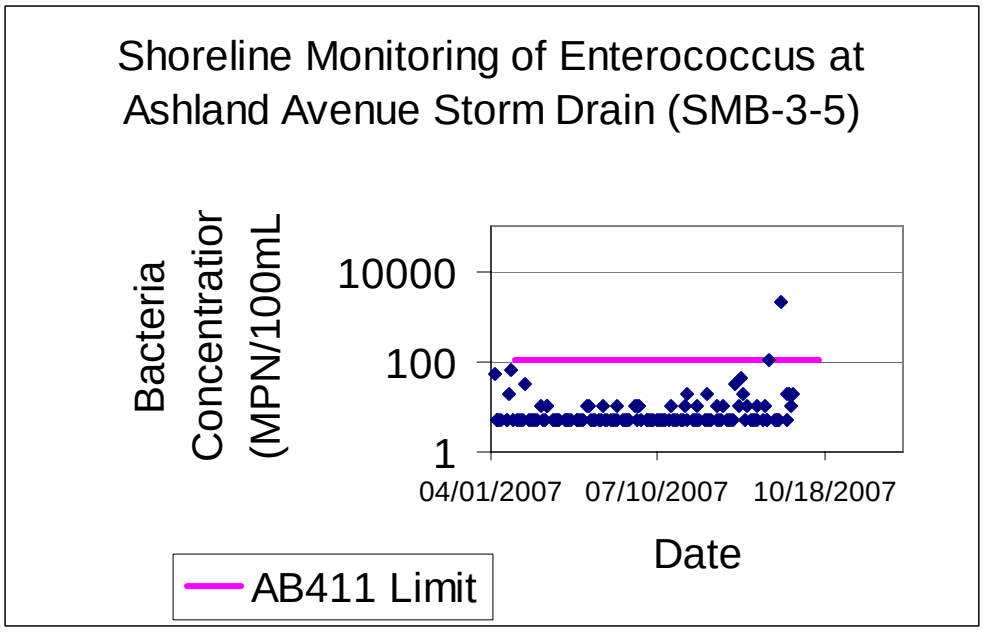


Figure 6) Shoreline Monitoring of Fecal Enterococcus at Ashland Avenue Storm Drain

Figures 4 to 6 illustrate that bacteria samples taken at the outfall of the Ashland Avenue storm drain were generally below AB411 single sample limits. A couple of exceedences were observed for Total Coliform, E. Coli, and Enterococcus. Flow from above the Low Flow Diversion was diverted to the sanitary sewer during this time period, suggesting that runoff from above the diversion did not contribute to shoreline water quality, and that bacterial exceedences can occur even when a Low Flow Diversion system is in place. There are natural and anthropogenic sources of bacteria that do not use the storm drain system to reach Santa Monica Bay, and flows below the diversion continue to contribute to shoreline water quality.

3. Conclusions and Recommendations

This project successfully diverted a little over 6 hundred thousand gallons of water to the sanitary sewer for treatment. The bacteria concentrations of all samples were several orders of magnitude greater than the AB 411 limits.

Water quality in Santa Monica Bay seems to have generally improved during the summer dry weather in the last five years. Water quality at Ashland Avenue generally seems to have improved as measured by Beach Mile Days, and remains high during summer dry periods according the Heal the Bay report card.

This Low-Flow Diversion Project successfully diverts water that often contains bacteria in excess of public health standards into the sanitary sewer for treatment. Summer dry weather water quality near the Ashland Avenue Storm Drain has been good since the completion of this project. In addition to the bacteria that are diverted away from the bay, metals, pesticides and other toxic substances are also sent to the sanitary sewer for treatment and disposal. While not measured in the course of this monitoring, this reduction in load is likely to be beneficial to the health of the bay.

However, steps should still be taken to prevent the degradation of current conditions including conducting source identification studies similar to the North Santa Monica Bay Source Identification Study conducted by the Los Angeles County Department Of Public Works and partnership with the Los Angeles County Department of Public Health, Heal the Bay and the Southern California Coastal Waters Research Program in the event that an exceedance is detected. Rapid identification of bacteria sources will allow for quick assessment of the threat and for the proper remedial measures to be taken.

The Low Flow Diversion at Ashland Avenue was started operating on June 10, 2006. It operates from May to October of each year. In the past, the pump failed and was replaced. Presently, inspection, routine cleaning of well and water sampling is done on weekly basis. If system does not operate properly and at peak performance if it will not comply with NPDES standards because of failure of telemetry, pumps, electric control mechanisms, these equipments will have to be replaced or repaired. Recalibration of flow meters may be required. Overall, under normal conditions, the low flow diversion system operates properly.

4. Contact Information

For questions regarding the Project 7401, the Ashland Avenue Low-Flow Diversion Project, please contact Ms. Maria Sim, Associate Civil Engineer, of Los Angeles County Department of Public Works, at 626 458 5956 or msim@dpw.lacounty.gov.

Questions specifically regarding the content of this Final Project Report may be directed to Mr. John Merrifield, Associate Civil Engineer of Los Angeles County Department of Public Works, at 626 458 4361 or jmerrifi@dpw.lacounty.gov.

5. References

BeachWatch Beach Mile Days Reports, http://beachwatch.waterboards.ca.gov.

Heal the Bay Summer Report Cards, http://healthebay.org/brc/summer/default.asp, accessed 10/22/07

Appendix A Bacterial Monitoring Data

Appendix B Chains of Custody and Field Data Sheets

Appendix C Beach Report Cards

Appendix D Grant Documents and Project Photos

Appendix E Shoreline Monitoring Data