

May 2006

FINAL

FINAL REPORT  
FOR THE  
North Westchester Storm Drain  
LOW-FLOW DIVERSION PROJECT

Clean Beaches Initiative Project No. 110  
Agreement Number: 02-221-550-0

May 2006

Prepared for

State Water Resources Control Board

Prepared By

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

## TABLE OF CONTENTS

|   |           |
|---|-----------|
| <b>1. INTRODUCTION.....</b>                           | <b>4</b>  |
| 1.1 Problem Statement.....                            | 4         |
| 1.2 Water Sampling Requirements.....                  | 8         |
| <b>2. RESULTS.....</b>                                | <b>9</b>  |
| 2.1 Maintenance.....                                  | 9         |
| 2.2 Compliance with Industrial Wastewater Permit..... | 9         |
| 2.3 Bacteria Monitoring Results.....                  | 9         |
| 2.4 Flow Data.....                                    | 17        |
| 2.5 Beach Posting Results.....                        | 17        |
| <b>3. OTHER BENEFITS.....</b>                         | <b>18</b> |
| <b>4. CONCLUSIONS.....</b>                            | <b>19</b> |

### LIST OF TABLES

|   |    |
|---|----|
| Table 1. Schedule of Tasks Based on Agreement.....  | 3  |
| Table 2. Total Coliform measured per 100 ml at upstream of LFD and wave wash.....   | 11 |
| Table 3. Fecal Coliform at upstream, E.Coli at wave wash, both measured per 100 ml and their difference. Ratio of E. Coli results to fecal coliform assumed to equal 1 (SMBBB, 2004)..... | 12 |
| Table 4. Enterococcus measured per 100 ml at upstream of LFD and wave wash. ....  | 13 |
| Table 5. IDEXX detection limits. Samples not diluted.....   | 14 |
| Table 6. Beach Mile Days (BMD) for Dockweiler Beach (2000-2005).....  | 18 |

### LIST OF FIGURES

|   |    |
|---|----|
| Figure 1. Aerial photograph showing Duckweiler Beach, storm drain outlet, and nearby sewer for runoff discharge. .... | 5  |
| Figure 2. Outlet structure is a concrete box. ....  | 6  |
| Figure 3. Schematic of a typical low-flow diversion cross section.....  | 7  |
| Figure 4. Plot of Total Coliform at upstream, wave wash, and AB 411 standard.....                                     | 14 |
| Figure 5. Plot of fecal coliform, E.coli, and AB411 standards. ....   | 15 |
| Figure 6. Plot of Enterococcus at upstream, wave wash, and AB411 standards.....                                       | 16 |

**Table 1. Schedule of Tasks Based on Agreement.**

| <b>Task</b> | <b>Product</b>  | <b>Completion Date</b>               |
|-------------|---|--------------------------------------|
| 1.0         | Project Management and Administration                                   |                                      |
| 1.1         | Quarterly Reports/Subcontract Documentation Permits, Survey Form        | September 2005 to Project Completion |
| 2.0         | Federal, State, and Local Permitting                                    |                                      |
| 2.1         | California Coastal Development Permit                                   | May 2003                             |
| 2.2         | Caltrans Encroachment Permit  | May 2003                             |
| 2.3         | Los Angeles County Department of Beaches & Harbor Right-of-Entry Permit | April 2003                           |
| 2.4         | NPDES Discharge Elimination System Permit                               | May 2003                             |
| 3.0         | Quality Assurance Project Plan  |                                      |
| 3.1         | QAPP  | July 2004                            |
| 4.0         | Final Project Engineering   |                                      |
| 4.1         | 100% Project Design   | April 2003                           |
| 4.2         | Contract Documents  | June 2003                            |
| 4.3         | Award of Contract   | June 2003                            |
| 5.0         | Project Implementation  |                                      |
| 5.1         | Construction Contract   | October 2004                         |
| 5.2         | Geotechnical Engineering  | April 2003                           |
| 6.0         | Reporting   |                                      |
| 6.1         | Monitoring and Reporting Plan   | July 2004                            |
| 6.2         | Draft Final Report  | March 2006                           |
| 6.3         | Final Report  | July 2006                            |

## 1. INTRODUCTION

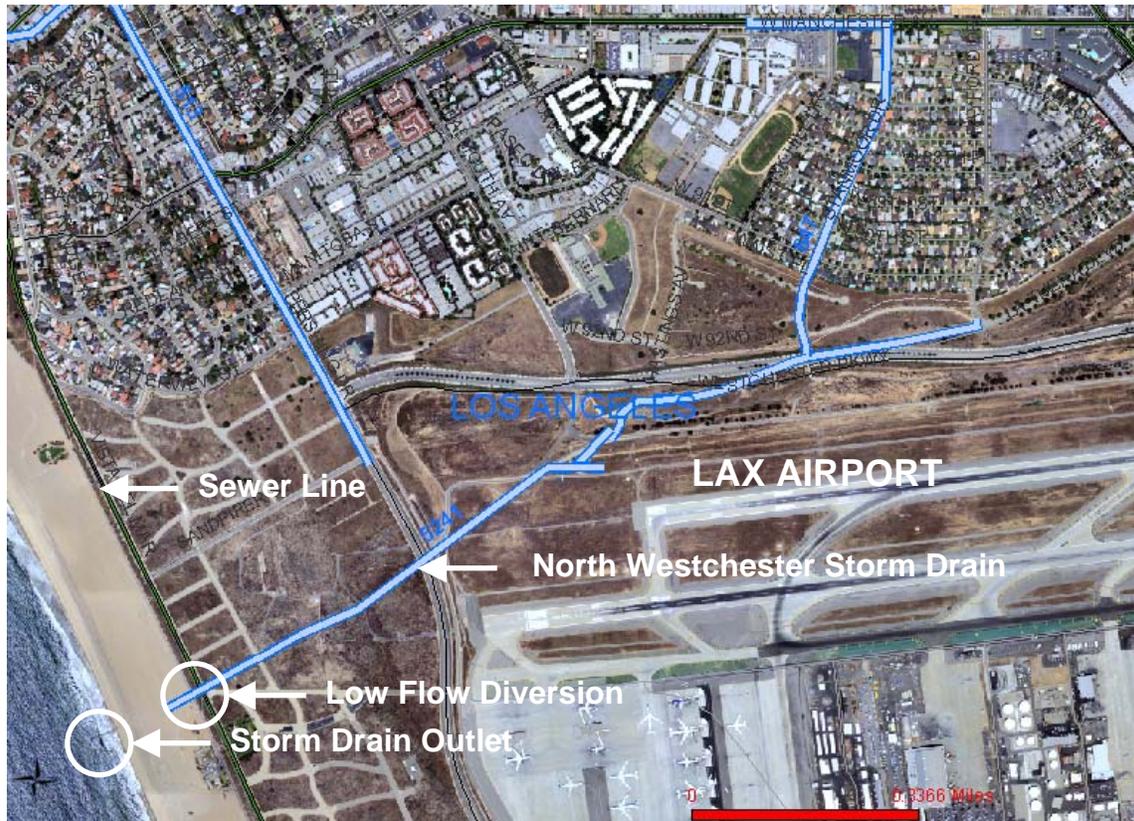
### 1.1 Problem Statement

Bacteria laden waters have long been recognized as indicative of pathogens. In order to reduce the risk to the public in the waters of Santa Monica Bay, the Los Angeles County Flood Control District (LACFCD) has built a low flow diversion facility (LFD) to divert dry weather flows from its North Westchester storm drain system into the sanitary sewer system near the western portion of Los Angeles International Airport (LAX) in the City of Los Angeles. Dry weather flows often contain elevated levels of bacteria, and are of sufficiently small volumes to allow economical treatment. The purpose of this project is to protect public health by reducing the risk of illness from urban runoff during dry weather (April through October) and to improve overall ocean water quality near the North Westchester storm drain outfall (MRP and QAPP, 2004).

Beaches in Santa Monica Bay were designated as impaired and included in California's 1998 and 2002 Clean Water Act (CWA) 303(d) lists of impaired waters due to coliform bacteria levels (*Santa Monica Bay Beaches Bacterial TMDLs Coordinated Shoreline Monitoring Plan*, April 2004). Although adjacent to a major metropolitan area, the Santa Monica Bay is not considered impaired for any other constituents such as metals, pesticides, algae, etc. With respect to developed Total Maximum Daily Loads (TMDLs) and for this project, the water quality in the bay is dependant only upon coliform and other indicator bacteria. The effectiveness of this project will be determined by comparing bacteria levels upstream of diverted urban runoff with those in the receiving water.

LACFCD and Los Angeles County Department of Public Works have several programs aimed at improving the water quality in Santa Monica Bay. Educational outreach programs help educate the public about their role in reducing water pollution through anti-littering campaigns, the direct link between storm drains and the ocean, recycling and the prevention and reporting of illegal dumping. Public Works maintains a 24-hour hotline (888-CLEAN LA) which can be used to report illegal dumping and to access information about pollution prevention. In addition to this LFD, LACFCD has constructed or has plans to construct more than 20 LFDs along the Los Angeles County coast. Additional information about pollution prevention in Los Angeles County can be found at our website, <http://ladpw.org/index.cfm> . LFD projects are an attempt to reduce the amount of bacteria introduced into Santa Monica Bay by dry weather flows from the storm drain system and to thereby reduce beach postings and closures.

North Westchester storm drain is located in Dockweiler State Beach on the western portion of Los Angeles International Airport (LAX) in the City of Los Angeles (Figure 1). The outlet structure is a (11' X 9'-2") concrete box structure extending out minimum of 50 yards into the surf zone (Figure 2). It is therefore always under water throughout the year. The storm drain connecting to the structure receives its urban runoff from West Manchester Boulevard in the community of Westchester and northern portions of Los Angeles International Airport (Figure 2). The hydrologic drainage area tributary to this drain is 2,416 acres. The area consists of mixed land uses.



**Figure 1. Aerial photograph showing Dockweiler Beach, storm drain outlet, and the nearby sewer line for runoff discharge.**

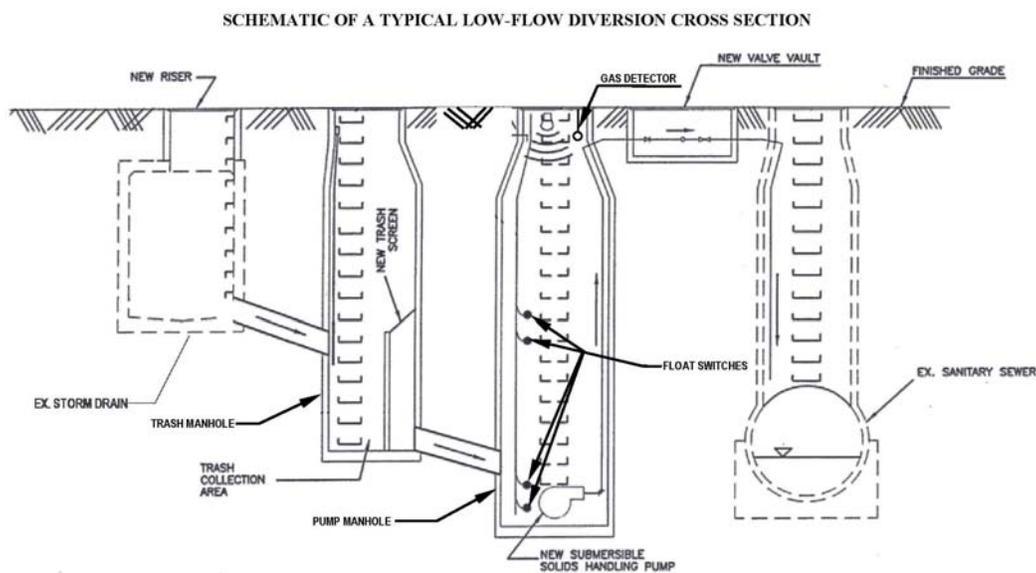


**Figure 2. Outlet structure is a concrete box.**

Dockweiler State Beach is visited by beach goers throughout the year. The main activities are cycling, jogging, surfing, swimming, picnicking, volleyball playing, etc. The beach area south of the LFD facility has recently been improved by Los Angeles County Department of Beaches and Harbors. The rehabilitation project includes the construction of additional paved parking, public restrooms, and a paved access road along the foothills of Vista Del Mar.

In February 2005, LACFCD received a Clean Beaches Initiative (CBI) grant (02-221-550-0) from the State Water Resources Control Board (SWRCB) to construct a LFD facility next to the North Westchester storm drain in order to help improve water quality at the shoreline. The LFD facility was designed to divert dry weather urban runoff to a sanitary sewer system.

A concrete berm built across the flow line in the existing storm drain diverts dry weather runoff into a vault where trash and bulk solids are separated by means of a bar screen. The runoff then enters a second vault where it is pumped into a sanitary sewer line. The sewer line capacity is sufficient to receive dry weather flows. Finer solids are capable of settling in both vaults where routine inspections and maintenance are performed to remove solids (Figure 3). In an operational mode, if the water level increases above the weir height, the pumps inside the pump vault stop diverting flow to the sanitary sewer. This situation occurs during wet weather season when a storm event can generate large flow volumes.



**Figure 3. Schematic of a typical low-flow diversion cross section.**

The construction of LFD was completed in October 2004. The facility began diverting dry weather runoff in May 2005. Watershed Management Division of the Los Angeles County Department Public Works obtained weekly runoff samples upstream of diversion and tested for bacteria levels. The sampling effort continued until October 31, 2005, the end of dry weather season. The current permit allows diversion of runoff during the dry weather season only (April through October). Currently, the diversion to the sewer line is not permitted during the wet weather season (November through March). Permission for year-round diversion of runoff is being negotiated with the City of Los Angeles.

The County also obtained shoreline bacteria monitoring data from the Environmental Monitoring Division of City of Los Angeles (EMD, 2004-05). This monitoring effort started in November 2004 and is ongoing as part of Santa Monica Bay Beaches Bacterial Total Maximum Daily Loads (TMDLs) coordinated shoreline monitoring. In this report, the data for bacteria levels from both locations are compared and the effectiveness of the low-flow diversion at North Westchester is also discussed.

## **1.2 Water Sampling Requirements**

As required by the agreement for the Proposition 40 CBI Grant program, LACFCD performed water quality monitoring in accordance with the submitted Quality Assurance Project Plan (QAPP, 2004) and a Monitoring Reporting Plan (MRP, 2004). The results of monitoring are included in this report. The County of Los Angeles collected representative grab samples of runoff upstream from a manhole adjacent to the diversion structure. A grab sample is the collection of a sample by a bucket pre-rinsed with runoff water at a location upstream of diversion structure inside the storm drain. The sample bottles contained a dechlorinating chemical to prevent bacteria from dying due to suspected chlorine in the water. The containers were kept on ice and were delivered to the County of Los Angeles, Department of Agricultural Commissioner and Weights and Measure – Environmental Toxicology Laboratory County Agricultural Lab within 6 hours of collection time. The samples were tested using multiple tube fermentation in Standard Methods (1999, 20th Edition) for total coliform (9221B), fecal coliform (9221E), and enterococcus (9230B). The frequency of sampling was once per week for one dry weather season.

Sampling at the wave wash was performed by EMD. Samples from the shoreline were analyzed for total coliform, E. Coli, and Enterococcus using IDEXX methods. The frequency of sampling at the shoreline was minimum of once per week and was repeated if the results exceeded AB411 bathing standards requirement that a single sample shall not exceed:

- 10,000 total coliform bacteria/100-mL or
- 400 fecal coliform bacteria/100-mL or
- 104 enterococcus bacteria/100-mL or
- 1,000 total coliform bacteria/100-mL, if the ratio of fecal/total coliform bacteria exceeds 0.1.

The Single Sample Method refers to a method of collection where water samples are collected in ankle deep water using a long pole with a sample bottle attached to the end to scoop up the water. The sample bottles are immediately capped and placed into an ice chest for preservation. The time, date, weather conditions and location of collection are recorded on a log sheet. The samples are then transported to a laboratory for analyses.

There are no requirements in the discharge permit issued by the City of Los Angeles, Sanitation Bureau on 4/16/2003 (Appendix A ). However, City's Bureau of Sanitation will test water samples discharging to its sewer line every 6 months for BOD and Suspended Solids. In contrast, permit to discharge for LFD facilities at other jurisdictional cities may require County to perform water sampling for an array of constituents.

## **2. RESULTS**

### **2.1 Maintenance**

In order to facilitate the operation of low-flow diversion sites, regularly scheduled inspections, monitoring, and maintenance are recommended. Together with experienced field personnel, a maintenance schedule was developed from monthly to five-year inspections for several segments of the facility. Trash and sediment clean out, calibration of the flow meter, and vector control are essential for the proper operation of the diversion,.

### **2.2 Compliance with Industrial Wastewater Permit**

LACFCD obtained a waste discharge permit as a local industrial user to discharge runoff into the City of Los Angeles sewer line at this location. There are no specific compliance or discharge limitations required by the City.

### **2.3 Bacteria Monitoring Results**

Monitoring bacteria population and investigating the effectiveness of LFD structure in improving the overall water quality of Dockweiler State Beach are the primary goals of the North Westchester LFD Project. The results of the bacteria monitoring for the dry weather runoff diverted from North Westchester storm drain and the shoreline monitoring are shown in Tables 2.3.1 through 2.3.3. The results indicate excessive levels of bacteria in the runoff which may contribute a significant amount of bacteria loading to the shoreline if not diverted. The bacteria levels from the storm drain runoff were measured using multiple tube fermentation at the Los Angeles County, Environmental Toxicology Laboratory. The laboratory results for field blanks were non detect except for one sample where field blank may have become contaminated. Less than 10% of routine samples were duplicates. For precision, the ranges for these duplicates were calculated using the Standards Methods 9020B and were less than 3.27 times the mean of the ranges. Therefore, precision was acceptable.

The Quality Assurance procedures used by EMD for sampling at the wave wash are in accordance with the Standard Methods for the Examination of Water and Wastewater, 18-20th Editions. EMD maintains certification and has participated in periodic intercalibration exercises. The interlaboratory calibration exercises are performed to comply with monitoring requirements of the Santa Monica Bay Beaches Bacterial Total Maximum Daily Loads. The purpose of intercalibration is to ensure that the participating laboratories data are comparable relative to the level of quality by standardization of sampling, analytical, and data handling/reporting methodologies and procedures. The results from the wave wash were based on IDEXX Chromogenic substrate method. E.Coli results can be converted to fecal coliform data by implementing a 1:1 translator. The application of a 1:1 translator was approved by the Los Angeles Regional Water Quality Control Board in October 2002 after review of the IDEXX and Membrane Filtration Study conducted by the City of Los Angeles. The bacteria levels at the wave wash are comparatively lower than the levels in the storm drain runoff. This is primarily due to diversion of runoff to the sewer line. In one case, enterococcus count at the wave wash was 380 exceeding AB 411 standards which occurred during a rain event on October 18, 2005. Total Coliform bacteria count was 8,700 but not nearly as high to exceed AB411 standards of 10,000 (Tables 2 and 4).

The exact bacteria count for some samples was not determined and was reported as less than or greater than detectable values e.g., upper and lower detection limits for total coliform were 13,000 and 67 per 100 mL (Table 4). For those cases, the data points were plotted in Figures 4-6 at detection limits forming an apparent horizontal line. There are no obvious patterns in the bacteria counts for total coliforms seen in Figure 4 in the runoff in the storm drain and at the shoreline. In Figure 5, fecal coliform counts appear to increase beginning in May and decrease in October, which is showing seasonal patterns. In Figure 6, results for enterococcus also show seasonal fluctuations with no obvious pattern.

According to a report by the Bureau of Sanitation, City of Los Angeles (2001), approximately 80 percent of runoff samples that were tested in the North Westchester storm drain exceeded AB-411 bathing water Standards while less than 10 percent of the samples that were tested in the mixing zone exceeded the standards. The data suggests that salinity, dilution, and bacteria die off rate may have contributed to lower exceedance in the wave wash.

**Table 2. Total Coliform measured per 100 ml at upstream of LFD and wave wash.**

| <b>Date Sampled</b> | <b>Upstream of LFD (MTF)</b> | <b>At Wave Wash (IDEXX)</b> | <b>Difference in Upstream and Wave Wash</b> |
|---------------------|------------------------------|-----------------------------|---|
| 05/03/05            | 9,000                        | 280                         | 8,720                                       |
| 05/10/05            | not sampled                  | 1,400                       | -   |
| 05/17/05            | 90,000                       | 67                          | 89,933                                      |
| 05/24/05            | 30,000                       | <67                         | > 29933                                     |
| 05/31/05            | 90,000                       | 210                         | 89,790                                      |
| 06/07/05            | 50,000                       | <67                         | > 49,933                                    |
| 06/14/05            | 24,000                       | <67                         | > 23,933                                    |
| 06/21/05            | 35,000                       | 67                          | 34,933                                      |
| 06/28/05            | 220,000                      | <67                         | > 219,933                                   |
| 07/05/05            | 300,000                      | 210                         | 299,790                                     |
| 07/12/05            | 240,000                      | 1,000                       | 239,000                                     |
| 07/19/05            | 24,000                       | 740                         | 23,260                                      |
| 07/26/05            | 50,000                       | <67                         | > 49,933                                    |
| 08/02/05            | 160,000                      | 67                          | 159,933                                     |
| 08/09/05            | 30,000                       | 280                         | 29,720                                      |
| 08/16/05            | 1,300                        | 4,400                       | -3,100                                      |
| 08/23/05            | 17,000                       | 130                         | 16,870                                      |
| 08/30/05            | 30,000                       | 67                          | 29,933                                      |
| 09/06/05            | 17,000                       | <67                         | > 16,933                                    |
| 09/13/05            | 500,000                      | 130                         | 499,870                                     |
| 09/20/05            | Rain                         | 280                         | -   |
| 09/27/05            | 17,000                       | 67                          | 16,933                                      |
| 10/04/05            | 160,000                      | 67                          | 159,933                                     |
| 10/11/05            | 9,000                        | <67                         | > 8,933                                     |
| 10/18/05            | Rain                         | 8,700                       | -   |
| 10/25/05            | 24,000                       | 280                         | 23,720                                      |
| 11/01/05            | 5,000                        | <67                         | > 4,933                                     |
| 11/08/05            | 9,000                        | 67                          | 8,933                                       |
| 11/15/05            | no diversion                 | 130                         | -   |
| 11/22/05            | no diversion                 | <67                         | -   |
| 11/29/05            | no diversion                 | <67                         | -   |

Note: Less than "<" refers to detection limit. Wave wash monitoring dates are +/- 1 days

**Table 3. Fecal Coliform at upstream, E.Coli at wave wash, both measured per 100 ml and their difference. Ratio of E. Coli results to fecal coliform assumed to equal 1 (SMBBB, 2004).**

| <b>Date Sampled</b> | <b>Fecal Coliform Upstream of LFD (MTF)</b> | <b>E. Coli Wave Wash (IDEXX)</b> | <b>Difference in Upstream and Wave Wash</b> |
|---------------------|---|----------------------------------|---|
| 05/03/05            | 1,100                                       | <67                              | > 1,033                                     |
| 05/10/05            | not sampled                                 | <67                              | -   |
| 05/17/05            | 500   | <67                              | > 433                                       |
| 05/24/05            | 500   | <67                              | > 433                                       |
| 05/31/05            | 3,000                                       | <67                              | > 2,933                                     |
| 06/07/05            | 5,000                                       | <67                              | > 4,933                                     |
| 06/14/05            | 800   | <67                              | > 733                                       |
| 06/21/05            | 3,000                                       | <67                              | > 2,933                                     |
| 06/28/05            | 170,000                                     | <67                              | > 169,933                                   |
| 07/05/05            | 300,000                                     | <67                              | > 299,933                                   |
| 07/12/05            | 1,300                                       | 67                               | 1,233                                       |
| 07/19/05            | 16,000                                      | 67                               | 15,933                                      |
| 07/26/05            | 800   | <67                              | > 733                                       |
| 08/02/05            | 24,000                                      | <67                              | > 23,933                                    |
| 08/09/05            | 1,700                                       | <67                              | > 1,633                                     |
| 08/16/05            | 500   | 67                               | 433   |
| 08/23/05            | 5,000                                       | <67                              | > 4,933                                     |
| 08/30/05            | 2,400                                       | <67                              | > 2,333                                     |
| 09/06/05            | 1,400                                       | <67                              | > 1333                                      |
| 09/13/05            | 240,000                                     | <67                              | > 239,933                                   |
| 09/20/05            | Rain  | <67                              | -   |
| 09/27/05            | 1,300                                       | <67                              | > 1,233                                     |
| 10/04/05            | 16,000                                      | <67                              | > 15,933                                    |
| 10/11/05            | 800   | <67                              | > 733                                       |
| 10/18/05            | Rain  | 130                              | -   |
| 10/25/05            | 3,000                                       | <67                              | > 2,933                                     |
| 11/01/05            | 800   | <67                              | > 733                                       |
| 11/08/05            | 500   | <67                              | > 433                                       |
| 11/15/05            | no diversion                                | <67                              | -   |
| 11/22/05            | no diversion                                | <67                              | -   |
| 11/29/05            | no diversion                                | <67                              | -   |

Note: Surf zone monitoring dates are +/-1 days

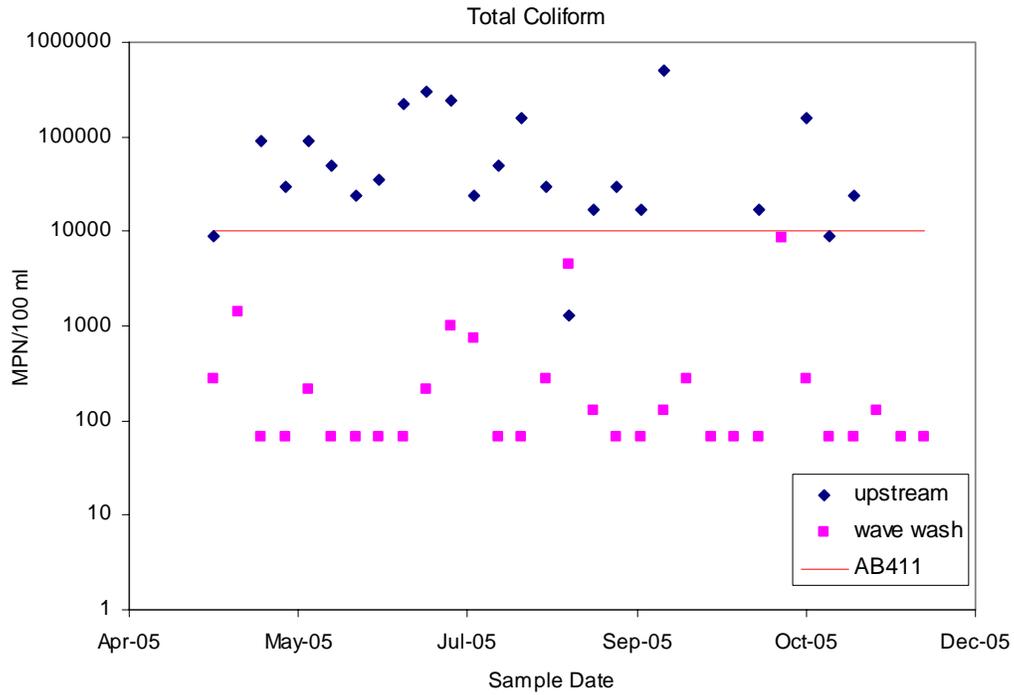
**Table 4. Enterococcus measured per 100 ml at upstream of LFD and wave wash.**

| <b>Date Sampled</b> | <b>Upstream of LFD (MTF)</b> | <b>Wave Wash (IDEXX)</b> | <b>Difference in Upstream and Wave Wash</b> |
|---------------------|------------------------------|--------------------------|---|
| 05/03/05            | 1,700                        | <10                      | > 1,690                                     |
| 05/10/05            | not sampled                  | <10                      | -   |
| 05/17/05            | 2,400                        | <10                      | > 2,390                                     |
| 05/24/05            | 3,000                        | 10                       | 2,990                                       |
| 05/31/05            | 160,000                      | 42                       | 160,000                                     |
| 06/07/05            | 22,000                       | <10                      | > 21,990                                    |
| 06/14/05            | 17,000                       | <10                      | > 16,990                                    |
| 06/21/05            | 9,000                        | <10                      | > 8,990                                     |
| 06/28/05            | 5,000                        | <10                      | > 4,990                                     |
| 07/05/05            | 24,000                       | <10                      | > 23,990                                    |
| 07/12/05            | 16,000                       | 10                       | 15,990                                      |
| 07/19/05            | 17,000                       | <10                      | > 16,990                                    |
| 07/26/05            | 1,700                        | <10                      | > 1,690                                     |
| 08/02/05            | 1,300                        | 10                       | 1,290                                       |
| 08/09/05            | 1,700                        | <10                      | > 1,690                                     |
| 08/16/05            | 500                          | 10                       | 490   |
| 08/23/05            | 5,000                        | <10                      | > 4,990                                     |
| 08/30/05            | 800                          | <10                      | > 790                                       |
| 09/06/05            | 14,000                       | <10                      | > 13,990                                    |
| 09/13/05            | 16,000                       | 20                       | > 16,000                                    |
| 09/20/05            | Rain                         | 20                       | -   |
| 09/27/05            | 800                          | <10                      | > 790                                       |
| 10/04/05            | 17,000                       | <10                      | > 16,990                                    |
| 10/11/05            | 1,300                        | <10                      | > 1,290                                     |
| 10/18/05            | Rain                         | 380                      | -   |
| 10/25/05            | 1,300                        | 10                       | 1,290                                       |
| 11/01/05            | 3,000                        | <10                      | > 2,990                                     |
| 11/08/05            | 700                          | <10                      | > 690                                       |
| 11/15/05            | no diversion                 | <10                      | -   |
| 11/22/05            | no diversion                 | <10                      | -   |
| 11/29/05            | no diversion                 | <10                      | -   |

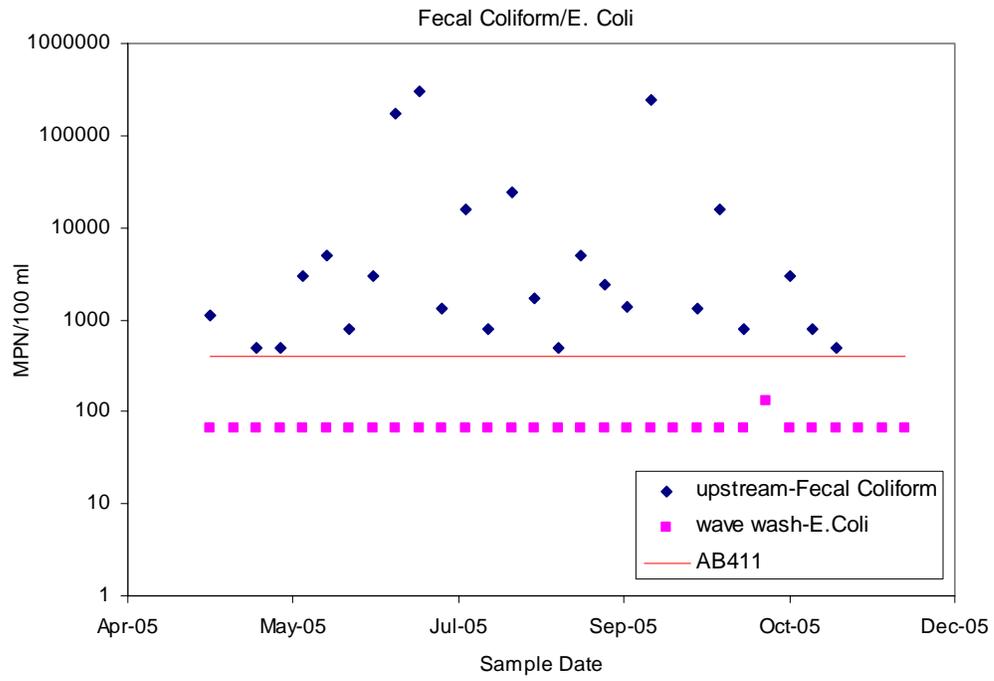
Note: Surf zone monitoring dates are +/-1 days

**Table 5. IDEXX detection limits. Samples not diluted**

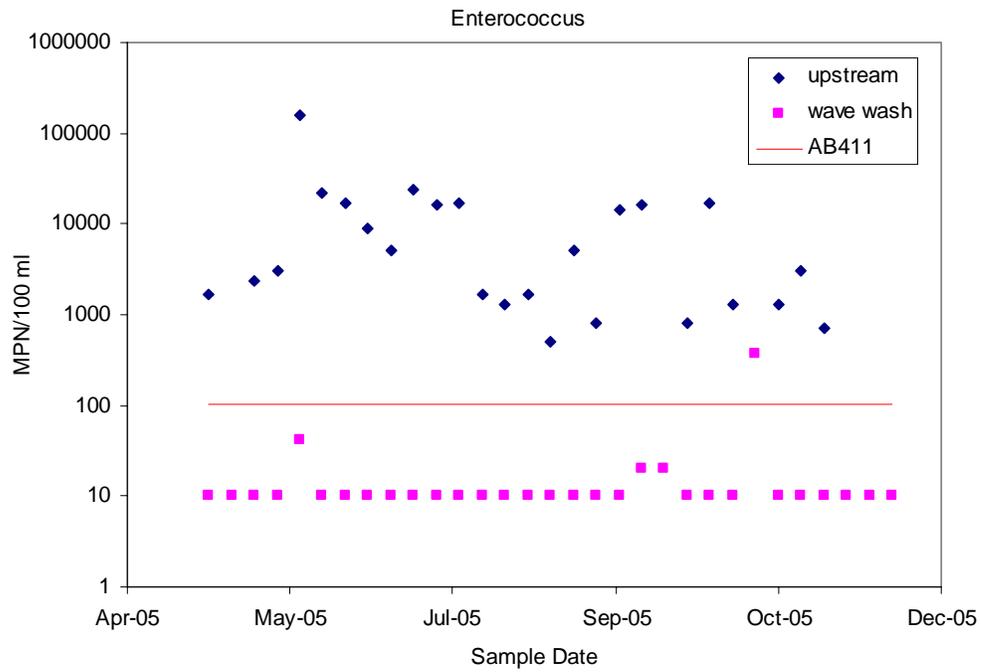
| Detection Limits | Total Coliform | E.Coli | Enterococcus |
|------------------|----------------|--------|--------------|
| Upper            | 13,000         | 13,000 | 2,000        |
| Lower            | 67             | 67     | 10           |



**Figure 4. Plot of Total Coliform at upstream, wave wash, and AB 411 standard.**



**Figure 5. Plot of fecal coliform, E.coli, and AB411 standards.**



**Figure 6. Plot of Enterococcus at upstream, wave wash, and AB411 standards.**

## **2.4 Flow Data**

An Isco 4220 flow meter (without sensor) is installed at this LFD facility to measure flow of runoff discharging into the sanitary sewer. The LFD facility at this location was inspected and began operation in May 2005. The flow data for May through September 2005 was lost due to low memory and automatic resetting of the flow meter. For the month of October (10/04/2005 through 10/23/2005), the recorded flow rates had a high of 72 gpm (259,000 GPD) with median equal to 40 gpm (144,000 GPD). Operating procedures require the LFD to be shut down between October and April. With this flow data, the bacteria load that was discharged into sewer line and was prevented from reaching the shoreline can be estimated. For example, using the median flow from the October data and the highest observed data for total coliform upstream (500,000 mpn/100 ml, Table 2), 2.73E12 counts of total coliform were diverted on September 13, 2005 in addition to other harmful bacteria, debris, sediment, and trash.

In order to prevent the future loss of data, equipment and software has been purchased to allow user configuration of the memory settings in the Isco4220 flow meter. Data was collected for this study at 15 minute intervals. However, since the pumps run intermittently, and often for less than 15 minutes, it is desirable to increase the collection frequency to improve the quality of flow data. The internal memory will be reconfigured to measure flow rates at 5 minute intervals. This reconfiguration will result in one month of available data storage. If the 15 minute interval had been retained up to 3 months of data could be stored. Flow data will be downloaded at least monthly as part of developing maintenance procedures for LFDs. Additionally, the LFD is instrumented with telemetric capabilities which will allow remote monitoring of pump operations.

## **2.5 Beach Posting Results**

Beach Mile Days (BMDs) is a more meaningful measurement of ocean and bay water impairment than the number of incidences of exceedences of AB411 standards or the number of days. This is because BMDs take into account both the amount of beach and the length of time of a closure or posting. SWRCB and all California coastal counties use BMDs for reporting closures and postings, which provides a standardized measurement allowing comparison of different areas (beach to beach or county to county) or assessing trends over time.

All closure and posting information can be accessed at the SWRCB's Website at <http://beachwatch.waterboards.ca.gov/>. A search of the database for all postings, permanent postings and closures at Dockweiler Beach for the time period January 1, 2000 to December 31, 2005 provided the number of BMDs for that time period. This data is shown below in Table 6. Although dry weather flows were diverted from the North Westchester storm drain during the 2005 AB411 year (April to October), there is no discernable reduction in the number of BMDs, either for the entire year or the AB411 year.

**Table 6. Beach Mile Days (BMD) for Dockweiler Beach (2000-2005)**

| Year  | BMD<br>(all year) | BMD (AB411<br>year, April 1 to<br>October 31) |
|---|-------------------|---|
| 2000  | 46.97             | 25.32   |
| 2001  | 6.16              | 2.79  |
| 2002  | 6.1               | 4.73  |
| 2003  | 25.91             | 11.06   |
| 2004  | 7.35              | 4.88  |
| 2005  | 9.46              | 6.81  |
| Dry Weather Flows were diverted from<br>North Westchester beginning in May<br>2005. |                   |   |

### **3. Other Benefits**

In addition to diverting bacteria from the shoreline during dry weather, LFD facilities have shown to be effective in capturing large quantities of trash and sediments that enter the storm drains. With regularly scheduled maintenance, collected trash and sediments inside the structure will be removed and disposed of at an off-site location. LFD facilities will also protect marine microorganisms from harmful pollutants such as metals and pesticides or spills by diverting low flows to the sanitary sewer system for treatment. This effort will help protect organisms in the bay and ocean from the toxic contents of urban runoff.

Currently, the LFD at North Westchester is scheduled to divert low flow urban runoff between April and October. This facility will ultimately receive a discharge permit to divert low flows continuously, which will help mitigate the effects of bacteria and other harmful pollutants throughout the year. With the help of similar State approved monitoring programs, additional information can be obtained to detect other harmful pollutants. The sources of these pollutants can then be identified and controlled.

#### **4. Conclusions**

The process for assessing the achievement of the purpose of this project was twofold. The first step was to measure bacteria levels in the storm drain and at the shoreline. The second was to evaluate the effectiveness of the LFD, both in its ability to divert bacteria laden flows to the sanitary sewer for treatment and in its ability to improve water quality at Dockweiler State Beach.

Monitoring bacteria levels was successfully completed. Analysis of water samples showed elevated bacteria levels in North Westchester storm drain. The water quality results at the shoreline were comparatively lower than the levels inside the storm drain and below AB411 standards. The results for fecal coliform counts show some obvious signs of increase in May and reduction in October for samples from the storm drain. It can be concluded that there is pathogenic indicator bacteria in the North Westchester storm drain, and that levels of pathogenic indicator bacteria at the shore are typically lower, but occasionally exceed AB411 standards.

The second step was also successfully completed. Field observations during the sampling visits showed that 100% of the flow was diverted to the diversion structure during the 2005 dry weather season. It can be concluded that the LFD facility is effective in removing the North Westchester storm drain as a point source for bacteria during dry weather because flows were successfully diverted to the sanitary sewer. Although not impaired for pollutants such as metals and pesticides, the waters of Santa Monica Bay benefit from LFDs because the diversion of low flows will eliminate the contribution of pollutants from storm drains that might otherwise harm the bay.

Water quality at Dockweiler Beach showed no significant changes based upon BMDs after the installation of this LFD. However, BMDs are based upon the entire length of Dockweiler Beach, and the North Westchester drain was only one of many sources along the 3 miles of beach. Local fauna and undiverted flows such as Ballona Creek may contribute pathogenic indicator bacteria to the waters of the bay. More work needs to be done to identify the sources of pathogenic indicator bacteria in Santa Monica Bay, but the North Westchester storm drain has been successfully removed as a point source when dry weather flows are diverted to the sanitary sewer system.

## References

California Environmental Protection Agency, State Water Resources Control Board, *Beach Advisory Report*, <http://beachwatch.waterboards.ca.gov/>.

City of Los Angeles, Department of Public Works, Bureau of Engineering, *Low-Flow Diversion of Dry-Weather Urban Runoff*, January 2001.

Clesceri, L.S., Greenberg, A.E., and Eaton, A.D., *Standard Methods for the Examination of Water and Wastewater*, 20th Edition. 1999.

Environmental Monitoring Division (EMD), Bureau of Sanitation, City of Los Angeles Department of Public Works, 2004-05. *Result of Santa Monica Bay Beaches Bacteria Shoreline Monitoring, November, 2004-November, 2005*.

Monitoring Reporting Plan (MRP), version 4, September 2004. North Westchester Storm Drain (CBI No. 110, Agreement No. 02-221-550-0).

Quality Assurance Project Plan (QAPP), version 4, September 2004. North Westchester Storm Drain (CBI No. 110, Agreement No. 02-221-550-0).

SMBBB. *Santa Monica Bay Beaches Bacterial TMDLs Coordinated Shoreline Monitoring Plan*, April 2004.

**For questions or comments concerning this report, please contact the following Los Angeles County Flood Control District staff:**

Tina Cheng, Project Manager Phone: (626) 458-5198 Email: [tcheng@ladpw.org](mailto:tcheng@ladpw.org)

John Merrifield, Associate Civil Engineer: (626)458-4361 Email: [jmerrifi@ladpw.org](mailto:jmerrifi@ladpw.org)

**Mailing Address:**

County of Los Angeles, Department of Public Works, P.O. Box 1460, Alhambra, CA 91802-1460

**APPENDIX A  
Industrial Wastewater permit**

**CITY OF LOS ANGELES**

DEPARTMENT OF PUBLIC WORKS  
BUREAU OF SANITATION



INDUSTRIAL WASTE MANAGEMENT DIVISION  
2714 MEDIA CENTER DRIVE  
LOS ANGELES, CA 90065  
(323) 342-6200

---

**INDUSTRIAL WASTEWATER PERMIT**

INDUSTRIAL USER NO: IU021012  
PERMIT NO: W-502510  
EFFECTIVE DATE: 04/16/2003  
AMENDED DATE: N/A  
EXPIRATION DATE: N/A

LEGAL BUSINESS NAME: LOS ANGELES COUNTY FLOOD CONTROL DISTRICT  
DOING BUSINESS AS: LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS  
MAILING ADDRESS: 900 S FREMONT AV  
ALHAMBRA CA 91803  
LOCATION ADDRESS: 8184 VISTA DEL MAR      *PROJ 5241*  
PLAYA DEL REY CA 90293  
CATEGORY: LOCAL INDUSTRIAL USER

POINT OF DISCHARGE: Sewer

In accordance with the provisions of the Los Angeles Municipal Code (L.A.M.C.) Section 64.30, the above identified industrial user is hereby authorized to discharge industrial wastewater through the approved point of discharge identified herein in accordance with the discharge limitations, conditions, and requirements set forth in this permit and the L.A.M.C. Compliance with this permit does not relieve the industrial user of its obligation to comply with all pretreatment regulations, standards or requirements under local, State and Federal laws, including any such laws, regulations, standards or requirements that may become effective during the term of this permit.

The industrial user must comply with the provisions of L.A.M.C. Section 64.30 and all terms and conditions of this permit. Noncompliance with the terms and conditions of this permit shall constitute a violation of the L.A.M.C. Section 64.30 and may subject the industrial user to administrative actions or other legal proceedings. This permit becomes void upon any change of ownership or location whatsoever.

Judith A. Wilson, Director  
Bureau of Sanitation

BY: *Karen Ingalla*

**COPY**

*Original @ imperial*