

ENGINEER'S REPORT

**RECYCLED WATER DUAL PLUMBED SYSTEM
AND IRRIGATION SYSTEM
For
1800 E. Wardlow Road**

JANUARY 2012

LONG BEACH WATER DEPARTMENT
1800 EAST WARDLOW ROAD
LONG BEACH, CA 90807-4994

ENGINEER'S REPORT

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1. INTRODUCTION

The Long Beach Water Department (LBWD) remains committed to developing alternative water sources to conserve valuable potable water supplies for the City's growing needs. To reduce the City of Long Beach's need to purchase imported water and to develop new sources of water, the LBWD continues to expand the City's recycled water system as new customers become available.

LBWD recycled water system consists of approximately 33 miles of distribution mains throughout the City, two (2) main pump stations, and three (3), 3.3 MG storage tanks at its Alamitos Hills tank farm. LBWD receives recycled water from the Long Beach Water Reclamation Plant, owned and operated by the Sanitation Districts of Los Angeles County. At present, the annual recycled water demand for the system is approximately 9,000 acre-feet. LBWD is currently in the planning stage of expanding its recycled water system to the south-east and the western parts of the City.

The Long Beach Water Reclamation Plant treats wastewater by a three-stage (tertiary) process for industrial and irrigation uses. This treatment plant can produce up to 25 million gallons of wastewater everyday into filtered, clear, environmentally safe water that meets the requirements of Title 22 of the California Code of Regulations that govern such recycling.

Recycled water is used for irrigation purposes at the City's parks, golf courses, cemeteries, and numerous garden nurseries. Other users include the California State University at Long Beach, Long Beach City College, Long Beach Unified School District (LBUSD), Caltrans sites on the 405 and 605 Freeways, and THUMS (a collaboration of Texaco, Humble, Unocal, Mobil and Shell which operates four off-shore oil islands).

The City of Long Beach has adopted regulations governing recycled water connections and water use. These adopted regulations are included as **Appendix A**.

In addition, the Long Beach Water Department has prepared a "Reclaimed Water User Manual" for its customers. This manual is also included as **Appendix B**.

2. Project Description

1800 e Wardlow Road is a new office building constructed in 2011. The office is located on Wardlow Road between Cherry Avenue and Walnut Avenue in Long Beach, CA (**Figure 1**).

The new office building will have Three supplies. One Domestic Water Supply, and 2 Recycled Water Supplies. The First Recycled Water Supply will be a 2 In Meter for Irrigation. The average daily demand for this irrigation will be 1000 Gal and will irrigate an area of 2.70 Acres. The Second Recycled Water Supply will be a 2 inch meter for Water Closets and Urinals.

The New office building will be the Office for the Long Beach Water Department. The building will have 100 employees. The hours of operation are 8:00 AM – 4:30 PM Mon-Fri. The building will not be open to the public except for front desk reception area. There are 7 drinking fountains in the building. There is one lunch room on the First Floor in the office area.

SITE MAP
1800 E Wardlow Raod

Figure 1

Recycled Water Producer:
Sanitation Districts of Los Angeles County
1955 Workman Mill road
Whittier, CA 90601

Recycled Water Purveyor:
Long Beach Water Department
1800 E. Wardlow Road
Long Beach, CA 90807

Recycled Water User:
Long Beach Water Department
1800 E. Wardlow Road
Long Beach, CA 90807

3. DESCRIPTION OF THE PROPOSED FACILITIES

The proposed facilities are as follows:

- A. A new 2-inch service connection will be constructed from the existing 6-inch recycled water main in E. Wardlow Road. The new service lateral will be located in E. Wardlow Road, West of the intersection of Cherry Avenue (Figure 1). This recycled water service lateral will be connected to the irrigation system
- B. A new 2-inch service connection will be constructed from the existing 6-inch recycled water main in E. Wardlow Road. The new service lateral will be located in E. Wardlow Road, West of the intersection of Cherry Avenue (Figure 1). This recycled water service lateral will be connected to the 17 water closets and 4 urinals. Recycled Water will NOT be used for drain trap priming.

The following plans are included:

- 1800 E. Wardlow Road Plumbing Plans.
- 1800 E. Wardlow Road Irrigation Plans.

4. SOURCES OF WATER SUPPLY

A. RECYCLED WATER SUPPLY

The Long Beach Water Reclamation Plant, operated by the Sanitation Districts of Los Angeles County serves as the source of recycled water in Long Beach. This plant converts wastewater to recycled water through a three stage (tertiary) process to prepare recycled water for industrial and irrigation uses. Up to 25 million gallons of wastewater undergo primary, secondary and tertiary treatment daily to produce filtered, clear, environmentally safe water that meets the requirements of Title 22 of the California Code of Regulations which govern such recycling.

The table below summarizes the quality of effluent from the Long Beach Water Reclamation Plant. The water qualifies as disinfected tertiary recycled water. Key monitoring criteria are as follows:

Constituent	Long Beach WRP Effluent Quality FY 2006-2007	Title 22 Requirement for Irrigation
Process	Disinfected Tertiary Effluent	Disinfected Tertiary Effluent
Mean total Coliform	<1.0 MPN	2.2 MPN
Mean Turbidity	.07 NTU	2.0 NTU
Maximum Turbidity	2.4 NTU	5.0 NTU

Additional recycled water quality data for the Long Beach Water Reclamation Plant is included in **Appendix D**.

B. POTABLE WATER SUPPLY

The potable water supply is supplied from the LBWD's Groundwater Treatment Plant which treats well water from the local aquifers and deliver treated water to the City's water distribution system. Groundwater and imported water from Metropolitan Water District of Southern California (MWD) are blended in the distribution system to produce water which is in compliance with the California Domestic Water Quality and Monitoring Regulations.

5. OPERATIONAL PLAN

A. SUPERVISION

Long Beach Water Department has designated an on-site supervisor (Person A) who will be responsible for the operation, maintenance, and monitoring of the recycled and potable water systems to ensure that no cross connections are made at any time. The supervisor or his/her representative shall be available during normal working hours or off-hours in case of an emergency.

The supervisor shall receive a copy of the Long Beach Reclaimed Water Users Manual and Long Beach Water Department Rules and Regulations Part 9 entitled "Reclaimed Water Service. These documents are included with this Engineering Report as **Appendices A and B**. Current copies of these documents shall be maintained in the supervisor's office at all times.

B. TEMPORARY CONNECTION TO POTABLE WATER SERVICE

After the separation of the irrigation service and dual plumbed service from the potable water system, an initial cross-connection test and inspection will be conducted of both the recycled and the remaining potable water on-site system. This test is described below. It will be conducted in the presence of representatives of the Long Beach Water Department and the City of Long Beach Department of Health Services.

C. PRECONVERSION CROSS-CONNECTION CONTROL TEST

1. The activated and pressurized on-site recycled water system shall be shut down at or near the point of connection.
2. After shutting down the on-site recycled water system, open each outlet of the recycled water system.
3. Allow sufficient time for initial flows to escape the system due to depressurization and system draining.
4. Continuing flow from any recycled water system outlet or sprinkler shall be deemed to indicate a cross-connection condition.
5. After testing the on-site recycled water system, close outlets and re-pressurize the system prior to testing the on-site potable water system.
6. Shut down the activated and pressurized on-site potable water system at or near the point of connection.

7. After shutting down the on-site potable water system, open each outlet of the potable water system.
8. Allow sufficient time for initial flows to escape the system due to depressurization and system draining.
9. Continuing flow from any potable water system outlet shall also be deemed to indicate a cross-connection condition.
10. After testing the on-site potable water system, close outlets and re-pressurize the system.

D. FINAL CONVERSION TO RECYCLED WATER SERVICE

The existing potable water service to the recycled water irrigation piping system will be converted to recycled water only after written approval from the City of Long Beach Department of Health Services and the California Department of Health Services, has been obtained.

E. FINAL INSPECTION AND CROSS CONNECTION CONTROL TEST

The final inspection and cross-connection control test shall be conducted following conversion to the recycled water system. The test shall follow the same procedures outlined above for the pre-conversion cross-connection control test except that the potable and recycled water systems shall each be shut down for at least 24 hours.

The inspection and cross-connection control test shall be scheduled in coordination with the City of Long Beach Department of Health Services.

6. CROSS CONNECTION CONTROL

The City has adopted an ordinance instituting a cross-connection control program to protect the public water supply system from potential contamination. The program contains all the elements required by Section 7584, Title 17 of the California Code of Regulations. The ordinance prohibits physical interconnection of the recycled water system and the potable water system within users' premises served by the City.

A. BACKFLOW PROTECTION AT SERVICE CONNECTIONS

All connections to the City's potable water supply are equipped with reduced pressure principle device (RPPD) assemblies. These backflow prevention devices have been tested and are tested annually by a certified

tester to confirm that they prevent backflow of water from the user's premises to the potable water system.

Results of these tests will be submitted to and retained by the Long Beach Water Department.

B. CROSS CONNECTION CONTROL TEST

When required by the LBHD or LBWD, the cross-connection control test shall be conducted by the City with the on-site supervisor following the same procedures used in the pre-conversion cross-connection control test. Prior to the cross-connection control test (required every 4 years), an on-site cross-connection survey shall be conducted by the City's Cross-Connection Control Specialist and the health department with the presence of the on-site supervisor.

Potable water connections are located at the following locations:

1. 1800 E. Wardlow Road, West of the intersection of Cherry Avenue
The cross connection shutdown testing will be conducted every 4 years or when ever modifications are made to the system

C. ANNUAL SITE SURVEY INSPECTION

The on-site survey shall include but not be limited to the following:

1. Check locations of meters for both recycled and potable water systems to verify that no changes or modifications have been made.
2. Check the backflow preventer for the potable water connections to the park listed above.
3. Check the backflow preventer for the recycled water system listed above.
4. Check all recycled water system control and shutoff valves and irrigation valves to verify that all seals are in place, functional and undisturbed.
5. Check recycled water pressure downstream from pressure reducing valve. Since the potable water supply typically operates between 70 and 75 psi, the on-site recycled water system should be set between 60 and 65 psi to minimize the potential for backsiphonage.
6. Check signage.

A report on the results of the on-site cross-connection surveys shall be submitted to Department of Public Health (DPH) and the County Health Department. Records of all surveys and cross-connection control tests shall be kept and maintained by the Long Beach Water Department for at least three years.

7. EMERGENCY RESPONSE PLAN

In the event that a cross-connection is detected during the annual cross-connection control test or at any other time, or in the event that a backflow incident occurs or is suspected, the following procedures shall be implemented.

- A. Immediately shut down **all** recycled water services **and** maintain pressure on all potable water services into the property.

- B. The recycled water agency shall notify the department of any incidence of backflow from the dual-plumbed recycled water system into the potable water system within 24 hours of the discovery of the incident.
Notify the following agencies:

- 1. Long Beach Water Department
1800 East Wardlow Road
Long Beach 90807-4994
Patricia Robinson
(562) 570-2300

- 2. City of Long Beach Department of Health and Human Services
2525 Grand Avenue
Long Beach 90815
Steve Nakauchi
(562) 570-5134

- 3. California Department of Public Health
500 N Central Ave., Suite 500
Glendale, CA 91203
Paul Williams
(818) 551-2004

- 1. The Long Beach Water Department will collect water samples and perform bacteriological analyses.

- 2. Investigate the cause or location of the cross-connection and eliminate the cross-connection if found.

- 3. Conduct a cross-connection control test following the procedures in the initial cross-connection control test.

4. The Long Beach Water Department will superchlorinate the potable water system and maintain a chlorine residual of at least 50 mg/L for at least 24 hours.
5. Flush the system after 24 hours.
6. The Long Beach Water Department will collect water samples and perform bacteriological analyses again.
7. If the bacteriological samples indicate negative (contaminant-free) results, obtain approval from City of Long Beach Department of Health and Human Services and California Department of Health Services before placing systems back in service.

8. HEALTH AGENCIES' CONDITIONS

A. STIPULATED RECYCLED WATER USES

California Department of public Health (CDPH) require that specific conditions be met before granting approval to supply recycled water for landscape irrigation. These conditions are enumerated below and immediately followed by responses

CDPH requirements are predicated on the following:

1. *Effluent from the Long Beach Water Reclamation Plant will be used for all recycled water. This water meets the requirements under Title 22 of the California Code of Regulations for "disinfected tertiary effluent."*
2. *Use of recycled water at this site will be solely for landscape irrigation of parks, playgrounds and other landscaped areas.*
3. *No recycled water will be used for impoundments.*

B. APPLICABLE REGULATIONS

Applicable regulations for these uses are quoted below.

1. Chapter 5 Article 2 Section 116800 of the California Health and Safety Code reads as follows:

Local health officers may maintain programs for the control of cross connections by water users, within the user's premises, where public exposure to drinking water contaminated by backflow may occur. The programs may include inspections within water user's premises for the purpose of identifying cross-connection hazards and determining appropriate backflow protection.

A cross connection control plan is enumerated in Sections 5 and 6 of this Engineering Report.

2. Chapter 5 Article 2 Section 116800 of the California Health and Safety Code reads as follows:

All pipes installed above or below ground, on and after June 1, 1993 that are designed to carry recycled water shall be colored purple or distinctively wrapped with purple tape.

The existing piping was installed below ground before June 1, 1993. Any new recycled water pipe will be colored purple.

3. Article 4 Section 60310(g) of Title 22 reads as follows:

All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the words "RECYCLED WATER – DO NOT DRINK." Each sign shall display an international symbol similar to that shown in figure 60310 A.

No hose bibs or other connections will be connected with recycled water. The only outlet accessible to the public will be lawn sprinklers connected to the recycled water irrigation system.

Signs will be posted on gates and at reasonable frequency on fences to warn the public not to drink from the sprinklers.

4. Article 4 Section 60310(i) of Title 22 reads as follows:

The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibs. Only quick couplers that differ from those used on the potable water system shall be used on portions of the recycled water system in areas subject to public access.

No hose bibs or other connections will be connected with recycled water.

5. Article 6 Section 60321 of Title 22 reads as follows:

Disinfected tertiary recycled water shall be continuously sampled for turbidity using a continuous turbidity meter and recorder following filtration.

Sampling and analysis of results for disinfected tertiary water is provided by the County Sanitation Districts at the Long Beach Water Reclamation Plant.

6. Article 7 Section 60323 of Title 22 reads as follows:

No person shall produce or supply reclaimed water for direct reuse from a proposed water reclamation plant unless he files an engineering report.

The report shall be prepared by a properly qualified engineer registered in California and experienced in the field of wastewater treatment, and shall contain a description of the design of the proposed reclamation system. The report shall clearly indicate the means for compliance with these regulations and any other features specified by the regulatory agency.

This engineering report has been prepared by a licensed California Civil Engineer in satisfaction of the above requirement.

The report shall contain a contingency plan which will assure that no untreated or inadequately treated wastewater will be delivered to the use area.

Disinfected tertiary water is produced by the County Sanitation Districts at the Long Beach Reclamation Plant and is continually monitored at that location. In addition to what incidental storage may exist in the chlorine contact chamber at the plant, the Long Beach Water Department maintains three 130-foot diameter, 40-foot high steel recycled water storage tanks at the Alamitos Tank Farm. These two tanks provide over 10 million gallons of treated recycled water storage as well as a forebay into which potable water can be transferred through an air gap into the recycled water system in the event of a prolonged upset at the Long Beach Water Reclamation Plant.

7. Article 2 Section 7603 (b) of Title 17 reads as follows:

A reduced pressure principal backflow prevention device shall be located (on potable water systems) as close as practical to the user's connection and shall be installed a minimum of twelve inches above grade and not more than 36 inches above grade measured from the bottom of the device and with a minimum of twelve inches side clearance.

Reduced pressure principal backflow preventers are provided on all potable water services in accordance with City of Long Beach Water Department standard details.

8. Article 2 Section 7603 (b) of Title 17 reads as follows:

The water supplier shall assure that adequate maintenance and periodic testing are provided by the water user to ensure the (backflow prevention device's) proper operation.

These procedures for periodic testing are described in Section 6 of this report.

APPENDIX A

Long Beach Water Department Regulations for Recycled Water Service

APPENDIX B

Reclaimed Water Users Manual

APPENDIX C

Water Quality Data – Long Beach Water Reclamation Plant