DEEP BAY IMPROVEMENT DISTRICT

ANNUAL WATER SYSTEM REPORT 2015

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1 Introduction

This annual report describes the Deep Bay Improvement District (DBID) water system and summarizes the water quality and production data from January 1, 2015 - December 31, 2015. This report also includes a summary of: inquiries and complaints; completed and proposed maintenance activities; and the Emergency Response Plan.

The DBID operates under a permit issued by Island Health (Vancouver Island Health Authority).

2 Deep Bay Improvement District

The Deep Bay Improvement District was incorporated in 1972 (originally as the Deep Bay Waterworks District). The water source comes from 7 groundwater wells. Water supply is stored in an above ground concrete reservoir and is not treated. The DBID supplies water to 605 metered services.

District contacts are:	Leslie Carter, Administrator	250-757-9312
	Don Buchner, Operator	250-951-8757

2.1 Groundwater Wells

Water supply for the DBID system is provided by seven wells that are located north and south of the Island Highway for a distance of 700 meters on either side of Gainsberg Road. Water from these wells is pumped directly into the distribution system.

DBID Well Data:

Well Name	Well Depth	Capacity	Treated/ Untreated	Year Drilled
#1	15.9 m (52 ft)	4.8 l/s (65 IGPM)	Untreated	1973
#2	11.6 m (38 ft)	3.0 l/s (40 IGPM)	Untreated	1973
#3	16.4 m (53.7 ft)	5.7 l/s (75 IGPM)	Untreated	1969
#4	19.3 m (63.5 ft)	5.3 l/s (70 IGPM)	Untreated	1977
#5	21.5 m (70.5 ft)	10.0 l/s (130 IGPM)	Untreated	1985
#6	23.2 m (76 ft)	9.0 l/s (120 IGPM)	Untreated	1990
#7	26.1 m (85.6 ft)	Not in production	Untreated	1996
#8	23 m (75.4 ft)	11.0 l/s (145 IGPM)	Untreated	1997

2.2 Reservoirs

Water storage for the DBID system is provided by an above ground concrete reservoir located on the hillside south of the Island Highway. This structure was built in 1975 and provides 545 cubic meters (120,000 Imperial Gallons) of storage. This reservoir is divided in half by a vertical wall and both sides can operate independently.

2.3 Distribution System

The DBID water distribution system serves an area of approximately 5 square kilometers. The system has been constructed over a period of more than 40 years. The original lines were built before the District was established in 1972. Approximately 80% of the system was constructed using Asbestos Cement (AC) pipe and the remainder is Polyvinyl Chloride (PVC) pipe. The system has 57 fire hydrants.

3 Water Sampling and Testing Program

Bacteriological monitoring is carried out semi-monthly throughout the distribution system. There are 4 sample sites, as identified by Island Health. Each site is sampled on a monthly basis and samples are delivered to the Parksville Health Unit where they are sent on for testing.

Positive Results: none

Date	Total coliform	E. Coli	Reason	Corrective Action

Adverse Results: none

Date	Total coliform	E. Coli	Reason	Corrective Action

Full test results from bacteriological monitoring are available for viewing at: http://www.healthspace.ca/viha

In November 2015, DBID undertook additional chemical analysis on all production wells and the reservoir. These samples were taken to North Island Labs for testing. All of the well and reservoir samples were within the chemical parameters listed in *The Guidelines for Canadian Drinking Water Quality*, with the following exceptions:

Site	Parameter	Result	Drinking Water Guidelines
Reservoir	Total Coliform	3.1	<1.0 MPN/100 ml
Well #3	Total Coliform	3.1	<1.0 MPN/100 ml
Well #1	Turbidity	3.48	>1.0 NTU
Well #2	Turbidity	5.23	>1.0 NTU
Well #1	Total Iron	0.442 mg/L	0.3 mg/L Aesthetic Objective
Well #2	Total Iron	0.772 mg/L	0.3 mg L Aesthetic Objective
Well #1	Total Lead	0.0143 mg/L	0.01 mg/L Max. Allowable Concentration

Regular system testing conducted subsequent to chemical analysis have all come back <1 for Total Coliform indicating that the coliform readings were a result of contamination occurring at the time of sampling. Additional testing will be conducted in 2016 to determine the source of lead in Well #1.

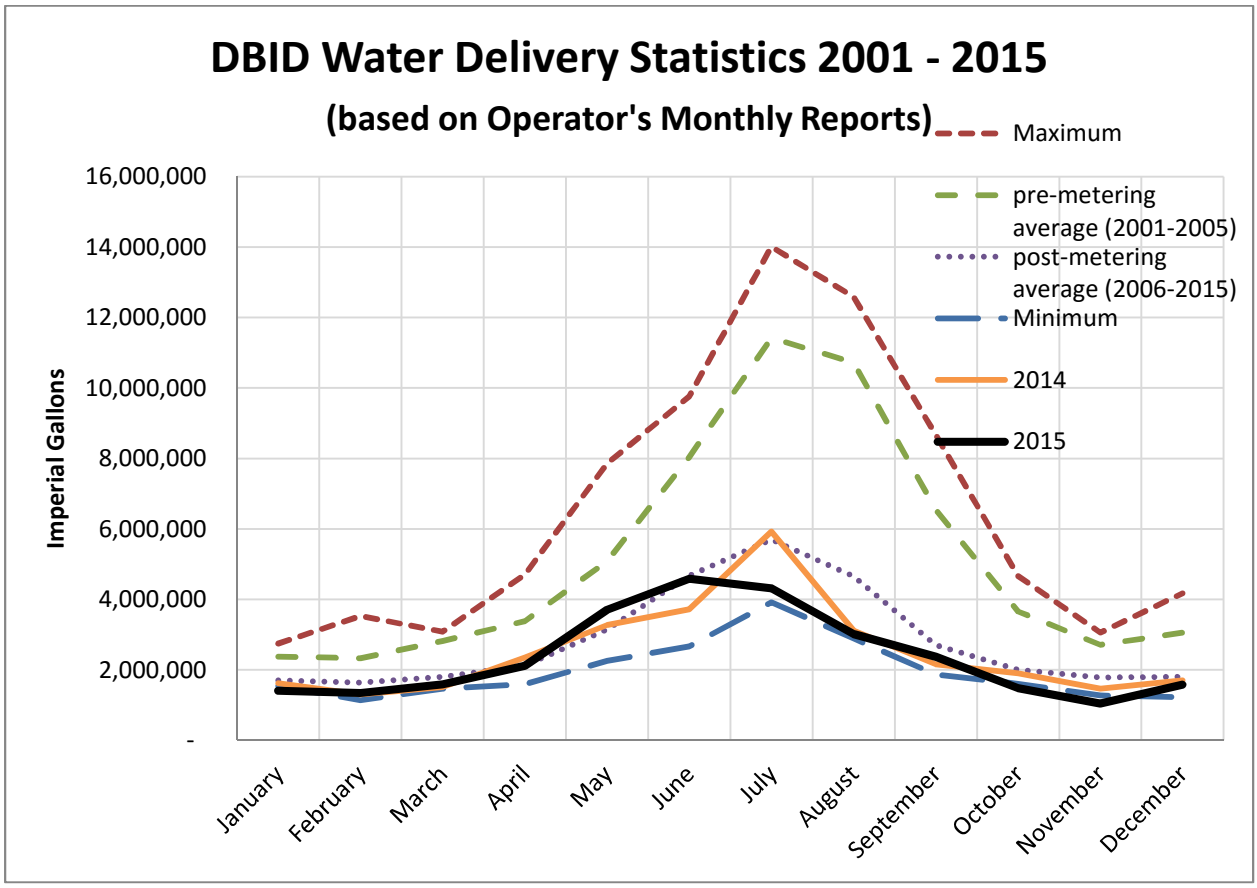
The full results of the chemical analysis are available for viewing at the DBID office and are posted on the website at www.dbid.ca under "Water Quality Reports".

4 Water Quality Inquiries and Complaints

The DBID did not receive any inquiries or complaints regarding water quality during 2015.

5 Groundwater Production and Consumption

The following graph shows the monthly water delivery figures from the DBID wells. Overall, water delivery for 2015 was below the post-metering average. Consumption in some of the spring and summer months was slightly higher than the post-metering average. Given the dry conditions that were experienced over the summer months, rate payers are to be commended for their careful use of water.



DBID conducts a water audit after each quarterly meter reading to compare the amount of water pumped, as measured at the wells, vs. the amount of water delivered through the water meters. The average difference for 2015 was 15.47% up from 12.51% in 2014. This difference is accounted for by water used for flushing (hydrants and reservoir), water used for fire protection purposes, and undetected water loss in the system. In the first quarter of 2015 an extensive hydrant flushing was undertaken accounting for some of the increase seen from 2014. Typical loss in a water system is 10-15%.

6 Maintenance Program

Production wells and the reservoir are inspected on a weekly basis to reduce or eliminate the risk of contamination and system failure. All meters have dual check valves that are tested annually to prevent backflow into the system. Isolation valves are exercised bi-annually. Air valves are inspected annually. Flushing program includes: flushing dead ends regularly, particularly during periods of low demand. Fire hydrants are serviced annually.

7 Water System Projects

7.1 2015 Completed Studies & Projects

- Completion of SCADA installation at wells #3 & 4. Installation of new meters and data loggers at all SCADA wells and associated programming ($69,273.06).
- Replacement of pump and well casing in Well #4 ($8,416.90).
- Installation of back-up generator at Well #8 ($24,151.41).
- Wellhead Protection Plan. Work started in 2015 and will be completed in 2016 ($6300). Estimated final cost $15,000.

7.2 2016 Proposed Projects & Upgrades

- Final programming & testing for data loggers as part of SCADA project. Estimated cost $2415.
- Wellhead Protection Plan. Started in 2015 and to be completed in 2016. Estimated final cost $15,000.

8 Emergency Response Plan

The Emergency Response Plan (ERP) was reviewed and updated in 2015. The DBID ERP includes:

- Emergency Phone Contact Lists
    - Personnel,
    - Government Agencies,
    - Contractors/Repair Services,
    - Technical Resources,
    - Parts Supply,
    - Bulk Water Suppliers, and
    - Media Contacts.
- Emergency Procedures
    - Unsafe Water Guidelines (Contamination of Well Space/s),
    - Loss of Source, Water Shortage, Broken Water Main, Pump Failure, Power Failures,
    - Flooding, Backflow or Back Siphonage,
    - Earthquake, and
    - Fire.
- Maps of System & Electrical Schematics

9 Report Distribution

Residents are notified by direct mail-out in the Pipeline Newsletter each year regarding the availability of this report. Annual Water System reports are available from the DBID office and on the website at www.dbid.ca under "Water Quality Reports". Copies will be mailed upon request. There is no charge for a copy of this report

A copy of this report is submitted to Island Health.