REGIONAL DISTRICT OF NANAIMO

# MELROSE

## Water Local Service Area

## Annual Report

## 2008

water SMART zero waste

# Table of Contents

## 1. Introduction

The following annual report describes the Melrose Water Local Service Area and summarizes the water quality and production data from 2008. This report also includes a summary of inquiries and complaints, completed and proposed maintenance activities, the Emergency Response Plan, and the Cross Connection Control Program.

This report is to be submitted to the Vancouver Island Health Authority by the Spring of 2009.

## 2. Melrose Water System

The Melrose Water Service Area was established in April 2005 when the RDN acquired the existing Melrose Terrace Strata Plan VIS3747 water system. The water service area is comprised of 28 residential properties on Melrose Road located near the Alberni Highway southwest of Coombs. The water source for the Melrose Water Service Area comes from one groundwater well located nearby. The water is chlorinated and stored in a single reservoir. The water is then filtered through sand and charcoal filters, and re-chlorinated before entering the distribution system. A map of the Melrose Water System is provided in Appendix A for reference.

### 2.1 Groundwater Wells

One groundwater production well is present at the reservoir site on Melrose Road, west of Coombs, B.C.

| Well / Name | Well Depth | Wellhead Protection | Treated/Untreated with Chlorine |
|---|---|---|---|
| #1 | 26.2 m | Yes | Treated |

### 2.2 Reservoirs

One service reservoir (steel structure) is present at 3853 Melrose Road, and has a capacity of 136 $m^3$ (30,000 imperial gallons).

### 2.3 Distribution System

The water distribution system in Melrose is comprised of 150mm PVC watermains. There are no fire hydrants located within the system.

## 3. Water Sampling and Testing Program

Water sampling and testing is carried out weekly in the distribution system. The following table includes a summary of all testing:

| Timing | Location | Tests |
|---|---|---|
| Weekly | RDN (in-house) Laboratory | Total coliforms, E.Coli<br>Temperature, pH, Conductivity<br>Chlorine residual, Salinity<br>Total Dissolved Solids<br>Iron, Manganese |
| Weekly (Health Dept. Requirement) | North Island Labs | Total, Fecal coliforms |
| Annual Source Water Testing | North Island Labs | Complete potability testing of each well |
| Annual System Water Testing | North Island Labs | Complete potability testing of distribution system |

## 4. Water Quality - Source Water and Distribution System

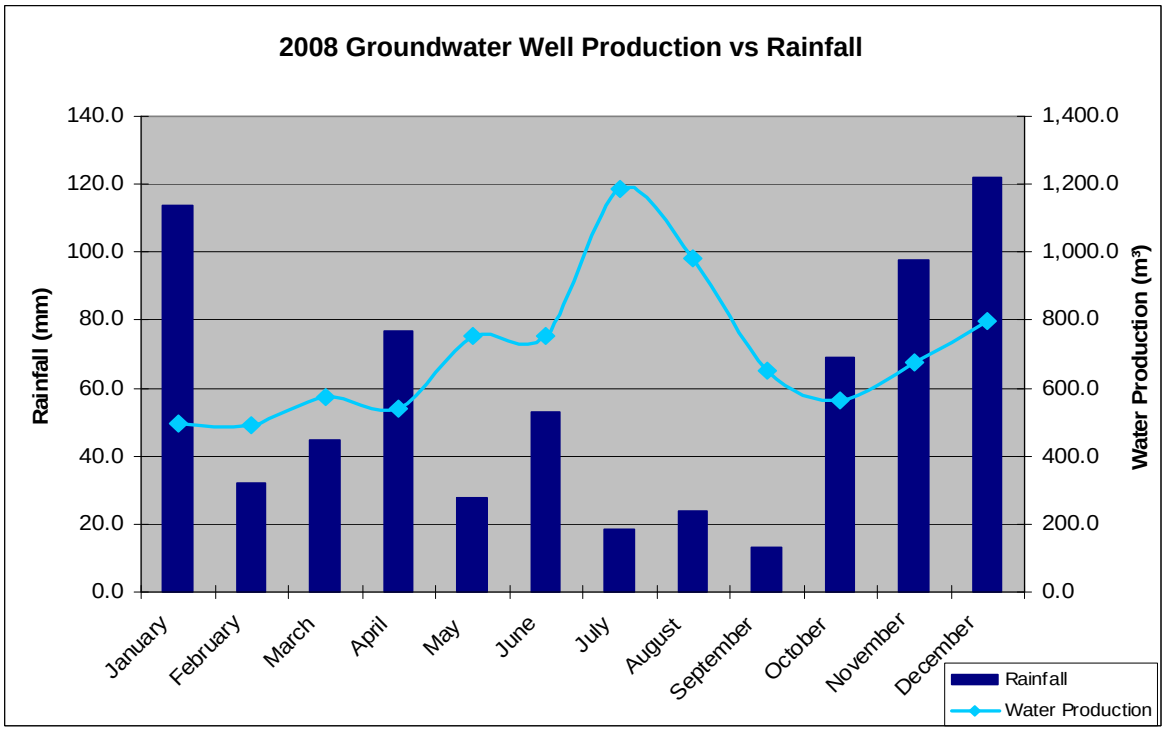
Up-to-date water quality reports and lab data are posted monthly on the RDN website at www.rdn.bc.ca in the WaterSmart section, under "Communities". Tables of water quality testing results for both the source water and distribution system are provided at the end of this report under Appendix B.

## 5. Water Quality Inquiries and Complaints

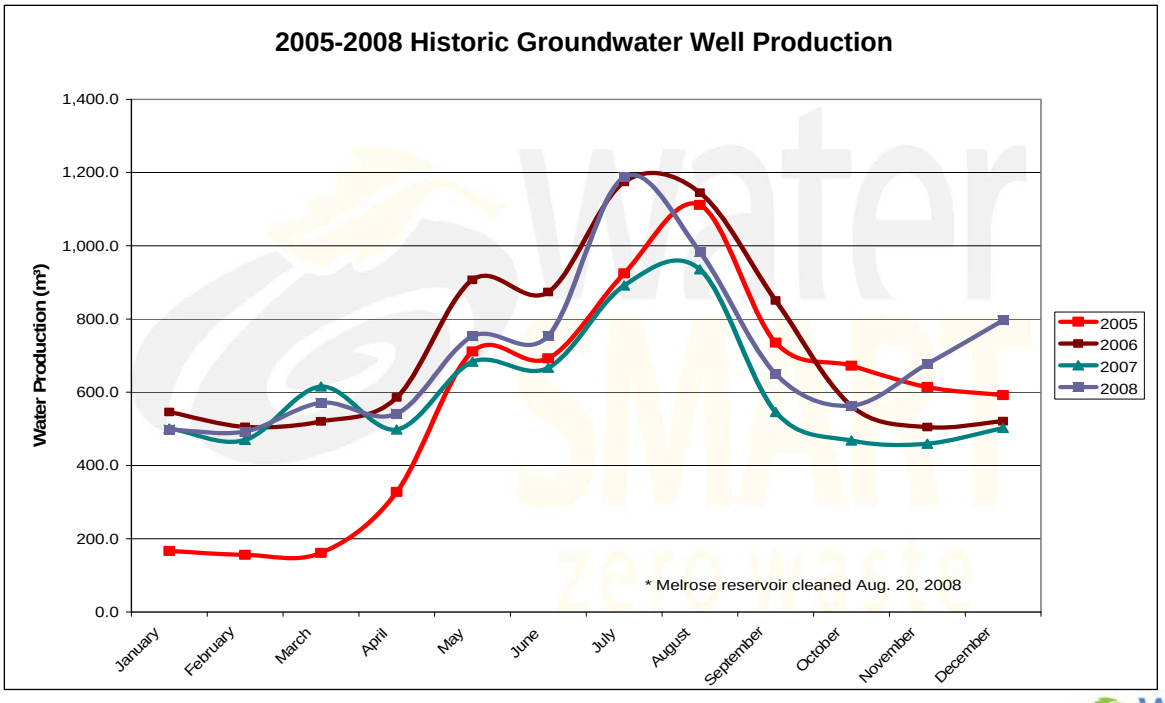
Very few complaints and inquiries were received from the Melrose water service area, and were typically related to power outages.

## 6. Groundwater Production and Consumption

The 2008 monthly groundwater production for the Melrose water service area is shown in the chart below. There are 28 water service connections in the Melrose water service area. Groundwater production has been charted against rainfall data from the City of Parksville website to show the correlation between rainfall and water consumption.




The monthly groundwater production for the Melrose water service area for the past 4 years is shown in the chart below. Groundwater production in 2008 was average in comparison to previous years.



*Consumption*

In the Fall/Winter of 2008, the average usage per home in the Melrose water service area was approximately 0.49 cubic metres per day (108 imperial gallons). In the summer, the average water usage was 0.8 cubic metres per day (176 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 252 L/day. This consumption is 18.4% less than the RDN system average of 298.4 L/day/capita for 2008.

## 7. Maintenance Program

Regular maintenance and inspections are completed around the wellhead area to reduce or eliminate the risk of contamination and system failure. Watermains are flushed once annually; in the Spring. There are no fire hydrants on the system.

## 8. Water System Projects

### 8.1 2008 Completed Studies & Projects

- Drained and cleaned the Melrose reservoir.
- Replaced all facility signs.
- Began keyless door entry installation (card lock) at the Water Services field office, and all pumphouse sites.
- Re-keyed all gates and points of entry.
- Established electrical connections for the mobile generator at key sites.
- Completed annual watermain flushing.
- Completed a comprehensive water conservation program (**Team WaterSmart**) from May to October.
- Initiated the WaterSmart school program in partnership with Nanaimo Recycling Exchange.
- Updated and improved the RDN **WaterSmart** website.
- Updated the Emergency Response Plan.
- Expanded the Operating Procedures binder.
- Completed the SCADA (Supervisory Control and Data Acquisition) Study.
- Completed the Innovative Water Supply and Re-Use study.
- Completed the *Action for Water* referendum process.
- Achieved Backflow Prevention Tester's Certification for 3 Operations staff.
- Created the Auto E-Message notification sign-up on the RDN website.

### 8.2 2009 Proposed Projects & Upgrades

- Complete repair to the pumphouse roof.
- Replace all water meters with radio-read meters.
- Establish the Drinking Water Protection Advisory Committee.
- Review the SCADA report and options for implementation.
- Complete the keyless door entry installations at all field sites.
- Commence the 2009 **Team WaterSmart** education program.
- Develop a rebate / incentive program.
- Develop the *Well Aware* well safety program.
- Install a stand-alone water sampling station.

8.3 2009 Proposed Studies

- Complete the well re-development study.

## 9. Emergency Response Plan

The Emergency Response Plan (ERP) was reviewed and updated in 2008. A copy of the ERP is attached in Appendix C.

## 10. Cross Connection Control

A formalized Cross Connection Control Program was initiated in 2007. Cross connection controls in-place include dual check valves at each service connection, fire hydrant use permits, and water supply bylaws noting discontinued service if a threat to the water supply is perceived by staff.

In 2008, a review and comparison of successful cross-connection control programs in other small water systems nearby was undertaken. A database of commercial customers was set-up in order to keep track of the maintenance history of testable backflow prevention assemblies at each site. Three RDN Operations staff achieved Backflow Prevention Tester's certification.

The program in 2009 will include:

- A survey of existing and potential cross-connections,
- An audit of RDN-owned facilities in each water service area,
- The preparation of a draft bylaw to allow enforcement of the Cross Connection Control Program.

## 11. Closing

An annual report for the year 2009 will be prepared and submitted to the Vancouver Island Health Authority in the Spring of 2010. Annual reports are also available on our website at www.rdn.bc.ca in the WaterSmart section, under "Communities".

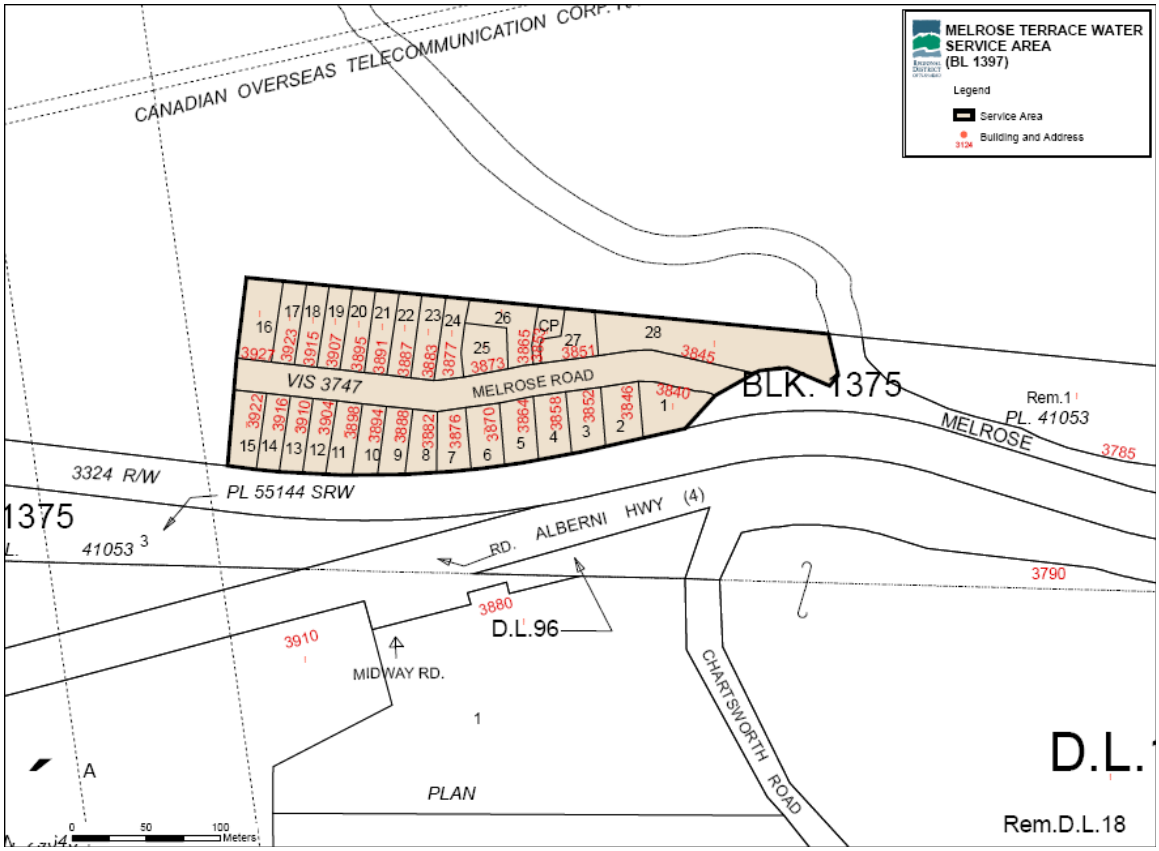
# APPENIDX A

## MAP OF MELROSE

## WATER LOCAL SERVICE AREA

# MELROSE

# WATER LOCAL SERVICE AREA



# APPENDIX B

# WATER QUALITY TESTING RESULTS

# Distribution Potability Test Results - Melrose Terrace

**(Treated Drinking Water)**

| Test | Water Quality Guidelines | | | | | | | | | | Date | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Units | CDWG | BCAWQG | | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | May 17 2006 | May 22 2007 | May 26 2008 |
| Color | CU | 15 | </=15 | AO | | | | | | | 20 | 13 | 15 | 6 |
| Conductivity | uS | | 700 | MAC | | | | | | | 443 | 388 | 350 | 438 |
| TDS | mg/L | 500 | </=500 | AO | | | | | | | 280 | 253 | 228 | 302 |
| Hardness (CaCO3) | mg/L | 80-100 | </=500 | AO | | | | | | | 130 | 120 | 140 | 130 |
| pH | pH units | 6.5-8.5 | 6.5-8.5 | AO | | | | | | | 6.8 | 6.9 | 7.8 | 6.98 |
| Turbidity | NTU's | 5 | 1 | MAC | | | | | | | <0.5 | 0.6 | <0.5 | <0.5 |
| Alkalinity | mg/L | | | | | | | | | | 73 | 90 | 81 | 80 |
| Chloride | mg/L | 250 | </=250 | AO | | | | | | | 80.5 | 61.2 | 74.8 | 79.4 |
| Fluoride | mg/L | 1.5 | 1.5 | MAC | | | | | | | <1.0 | <0.1 | <1.0 | <1.0 |
| Sulfate | mg/L | 500 | </=500 | AO | | | | | | | <2 | 9.1 | <2.0 | <2.0 |
| Nitrate | mg/L | 10 | 10 | MAC | | | | | | | <0.1 | <0.01 | <0.1 | <0.1 |
| Nitrite | mg/L | 1 | | | | | | | | | <0.1 | <0.01 | <0.1 | <0.1 |
| T-Aluminum | mg/L | | 0.2 | MAC | | | | | | | <0.005 | <0.005 | <0.005 | <0.05 |
| T-Antimony | mg/L | | 0.006 | MAC | | | | | | | <0.0002 | <0.0002 | <0.0002 | <0.001 |
| T-Arsenic | mg/L | 0.025 | 0.025 | IMAC | | | | | | | 0.02 | <0.0002 | <0.0002 | <0.001 |
| T-Barium | mg/L | 1.0 | 1 | MAC | | | | | | | 0.02 | 0.023 | 0.024 | 0.02 |
| T-Boron | mg/L | 5.0 | 5 | MAC | | | | | | | 0.007 | 0.006 | 0.008 | <0.02 |
| T-Cadmium | mg/L | 0.005 | | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.0003 |
| T-Calcium | mg/L | | | | | | | | | | 31.6 | 31.9 | 36.6 | 34.4 |
| T-Chromium | mg/L | 0.05 | 0.05 | MAC | | | | | | | 0.0007 | <0.0005 | <0.0005 | <0.003 |
| T-Copper | mg/L | 1.0 | </=1 | MAC | | | | | | | 0.007 | 0.034 | 0.019 | <0.005 |
| T-Iron | mg/L | 0.3 | </=0.3 | AO | | | | | | | <0.1 | 0.4 | 0.4 | 0.27 |
| T-Lead | mg/L | 0.01 | 0.01 | MAC | | | | | | | 0.0032 | 0.002 | 0.0015 | <0.0005 |
| T-Magnesium | mg/L | | </=700 | AO | | | | | | | 11.2 | 10.6 | 12.8 | 11.8 |
| T-Manganese | mg/L | 0.05 | </=0.05 | AO | | | | | | | <0.005 | 0.024 | 0.082 | 0.0094 |
| T-Mercury | mg/L | 0.001 | 0.001 | MAC | | | | | | | <0.0002 | <0.0001 | <0.0001 | <0.01 |
| T-Potassium | mg/L | | | | | | | | | | <0.4 | <0.4 | 0.4 | 0.4 |
| T-Selium | mg/L | 0.01 | 0.01 | MAC | | | | | | | <0.0002 | <0.0002 | <0.0002 | <0.003 |
| T-Sodium | mg/L | 200 | </=200 | AO | | | | | | | 36 | 21.9 | 14.8 | 29.9 |
| T-Uranium | mg/L | 0.1 | 0.1 | MAC | | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.002 |
| T-Zinc | mg/L | 5 | <5 | AO | | | | | | | 0.033 | 0.051 | 0.047 | 0.056 |
| Total Coliform | cfu/100ml | <1 | <1 | cfu/100ml | | | | | | | <1 | <1 | <1 | <1.0 |
| Fecal Coliform | cfu/100ml | <1 | <1 | cfu/100ml | | | | | | | <1 | <1 | <1 | |
| E.coli | cfu/100ml | <1 | <1 | cfu/100ml | | | | | | | | <1 | <1 | <1.0 |
| Tannins & Lignins | | | | | | | | | | | n/a | n/a | n/a | n/a |
| Trihalomethanes | mg/l | 0.1 | | MAC | | | | | | | n/a | 0.07 | n/a | n/a |

BCAWQG - BC approved water quality guidelines
MAC - maximum acceptable concentrations
IMAC - interim maximum acceptable concentrations
AO - aesthetic objective
Red font indicates non-compliance.

REGIONAL DISTRICT OF NANAIMO

# Melrose Well Water Analysis Results
## Canadian Drinking Water Guidelines Package

water SMART zero waste

Red font indicates non-compliance with Canadian Drinking Water Guidelines
MAC=Maximum Acceptable Concentration.
IMAC= Interim Maximum Acceptable Concentration.
AO= Asthetic Objective.

| Parameter | Units | CDWG | BCAWQG | | 2002 | 2003 | 2004 | 2005 | Oct 24 2006 | Oct 22 2007 | Oct 14 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Color | CU | 15 | </=15 | AO | | | | 200 | <5 | 200 | 500 |
| Conductivity | µS | | 700 | MAC | | | | 313 | 335 | 333 | 340 |
| Total Dissolved Solids | mg/L | 500 | </=500 | AO | | | | 272 | 220 | 246 | 308 |
| Hardness (CaCO3) | mg/L | 80-100 | </=500 | AO | | | | 120 | 120 | 130 | 140 |
| pH | pH units | 6.5-8.5 | 6.5-8.5 | AO | | | | 7.3 | 7.1 | 6.85 | 7.1 |
| Turbidity | NTU's | 5 | 1 | MAC | | | | 25.3 | 38 | 1.7 | 24.6 |
| Alkalinity | mg/L | | | | | | | 81 | 76 | 82 | 69 |
| Chloride | mg/L | 250 | </=250 | AO | | | | 40.6 | 51.3 | 48.1 | 63 |
| Fluoride | mg/L | 1.5 | 1.5 | MAC | | | | <1.0 | <1.0 | <1.0 | <1.0 |
| Sulfate | mg/L | 500 | </=500 | AO | | | | <2 | <2.0 | <2.0 | 2.6 |
| Nitrate (N) | mg/L | 10 | 10 | MAC | | | | <0.1 | <0.1 | <0.1 | <0.1 |
| Nitrite (N) | mg/L | 1 | | | | | | <0.1 | <0.1 | <0.1 | <0.1 |
| T-Aluminum | mg/L | | 0.2 | MAC | | | | 0.006 | <0.01 | 0.006 | <0.005 |
| T-Antimony | mg/L | | 0.006 | MAC | | | | <0.0002 | <0.0004 | <0.0002 | <0.0002 |
| T-Arsenic | mg/L | 0.025 | 0.025 | IMAC | | | | 0.0004 | <0.0004 | 0.0004 | 0.0003 |
| T- Barium | mg/L | 1.0 | 1 | MAC | | | | 0.022 | 0.022 | 0.026 | 0.02 |
| T-Boron | mg/L | 5.0 | 5 | MAC | | | | 0.007 | 0.007 | 0.006 | 0.005 |
| T-Cadmium | mg/L | 0.005 | | | | | | <0.00001 | <0.00002 | <0.00001 | <0.00001 |
| T-Calcium | mg/L | | | | | | | 32.3 | 30.5 | 34.1 | 33 |
| T-Chromium | mg/L | 0.05 | 0.05 | MAC | | | | 0.0008 | <0.001 | 0.0011 | 0.0005 |
| T-Copper | mg/L | 1.0 | </=1 | MAC | | | | 0.011 | <0.002 | <0.001 | 0.002 |
| T-Iron | mg/L | 0.3 | </=0.3 | AO | | | | 8.8 | 8.6 | 9.4 | 8.63 |
| T-Lead | mg/L | 0.01 | 0.01 | MAC | | | | 0.0056 | 0.0006 | <0.0001 | 0.0004 |
| T-Magnesium | mg/L | | </=700 | AO | | | | 10.4 | 11 | 11.4 | 12.9 |
| T-Manganese | mg/L | 0.05 | </=0.05 | AO | | | | 0.224 | 0.232 | 0.26 | 0.211 |
| T-Mercury | mg/L | 0.001 | 0.001 | MAC | | | | <0.0001 | <0.0001 | <0.0001 | <0.01 |
| T-Potassium | mg/L | | | | | | | <0.4 | <0.08 | <0.4 | 0.2 |
| T-Selenium | mg/L | 0.01 | 0.01 | MAC | | | | <0.0002 | <0.0004 | 0.0003 | <0.0006 |
| T-Sodium | mg/L | 200 | </=200 | AO | | | | 7.6 | 8.3 | 9.2 | 8.69 |
| T-Uranium | mg/L | 0.1 | 0.1 | MAC | | | | <0.0005 | <0.001 | <0.0005 | <0.0004 |
| T-Zinc | mg/L | 5 | <5 | AO | | | | 0.017 | 0.022 | 0.007 | 0.043 |
| | | | | | | | | | | | |
| Total Coliform | cfu/100ml | <1 | <1 | cfu/100ml | | | | <1 | <1 | <1 | <1 |
| Fecal Coliform | cfu/100ml | <1 | <1 | cfu/100ml | | | | <1 | <1 | <1 | <1 |
| E.coli | cfu/100ml | <1 | <1 | cfu/100ml | | | | | <1 | <1 | <1 |

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Jan-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-Jan | 3927 Melrose | 0 | 0 | 0 | 0 | 5 | 6.9 | 0.02 | 185 | 0.2 | 398 | 0.12 | 0.039 |
| 15-Jan | Pumphouse | | | 0 | 0 | 6 | 6.6 | 0.02 | 175 | 0.2 | 371 | | |
| 22-Jan | 3847 Melrose | | | | | 6 | 7 | 0.02 | 188 | 0.2 | 397 | | |
| | Average | 0 | 0 | 0 | 0 | 5.7 | 6.8 | 0.02 | 182.7 | 0.2 | 388.7 | 0.12 | 0.039 |
| | Maximum | 0 | 0 | 0 | 0 | 6 | 7 | 0.02 | 188 | 0.2 | 398 | 0.12 | 0.039 |
| | Minimum | 0 | 0 | 0 | 0 | 5 | 6.6 | 0.02 | 175 | 0.2 | 371 | 0.12 | 0.039 |

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines
Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Feb-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05-Feb | 3729 Melrose Ter | 0 | 0 | 0 | 0 | 6 | 6.6 | 0.01 | 187 | 0.2 | 402 | 0.31 | 0.022 |
| 12-Feb | Pumphouse | | | 0 | 0 | 8 | 6.6 | 0.02 | 184 | 0.2 | 391 | | |
| 20-Feb | 3847 Melrose Ter | | | 0 | 0 | 7 | 6.7 | 0.03 | 184 | 0.2 | 394 | | |
| 26-Feb | 3729 Melrose Ter | | | 0 | 0 | 8 | 6.5 | 0.02 | 185 | 0.2 | 390 | | |
| | **Average** | 0 | 0 | 0 | 0 | 7.3 | 6.6 | 0.02 | 185.0 | 0.2 | 394.3 | 0.31 | 0.022 |
| | **Maximum** | 0 | 0 | 0 | 0 | 8 | 6.7 | 0.03 | 187 | 0.2 | 402 | 0.31 | 0.022 |
| | **Minimum** | 0 | 0 | 0 | 0 | 6 | 6.5 | 0.01 | 184 | 0.2 | 390 | 0.31 | 0.022 |

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Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Mar-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-Mar | 3729 Melrose Ter | 0 | 0 | 0 | 0 | 8 | 6.5 | 0.02 | 184 | 0.2 | 390 | 0.18 | 0.027 |
| 12-Mar | Pumphouse | | | 0 | 0 | 11 | 6.5 | 0.02 | 185 | 392 | | | |
| 18-Mar | 3847 Melrose Ter | | | 0 | 0 | 8 | 6.6 | 0.03 | 185 | 0.2 | 394 | | |
| 26-Mar | 3729 Melrose Ter | | | | | 8 | 6.7 | 0.02 | 185 | 0.2 | 393 | | |
| | **Average** | 0 | 0 | 0 | 0 | 8.8 | 6.6 | 0.02 | 184.8 | 98.2 | 392.3 | 0.18 | 0.027 |
| | **Maximum** | 0 | 0 | 0 | 0 | 11 | 6.7 | 0.03 | 185 | 392 | 394 | 0.18 | 0.027 |
| | **Minimum** | 0 | 0 | 0 | 0 | 8 | 6.5 | 0.02 | 184 | 0.2 | 390 | 0.18 | 0.027 |

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Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Apr-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02-Apr | 3729 Melrose Ter | 0 | 0 | 0 | 0 | 8 | 6.6 | 0.03 | 187 | 0.2 | 396 | 0.12 | |
| 08-Apr | Pumphouse | | | 0 | 0 | 10 | 6.5 | 0.03 | 185 | 0.2 | 390 | | |
| 15-Apr | 3847 Melrose Ter | | | 0 | 0 | 10 | 6.5 | 0.03 | 187 | 0.2 | 392 | | 0.014 |
| 22-Apr | 3729 Melrose Ter | | | 0 | 0 | 10 | 6.5 | 0.02 | 186 | 0.2 | 395 | | |
| | Average | 0 | 0 | 0 | 0 | 9.5 | 6.5 | 0.03 | 186.3 | 0.2 | 393.3 | 0.12 | 0.014 |
| | Maximum | 0 | 0 | 0 | 0 | 10 | 6.6 | 0.03 | 187 | 0.2 | 396 | 0.12 | 0.014 |
| | Minimum | 0 | 0 | 0 | 0 | 8 | 6.5 | 0.02 | 185 | 0.2 | 390 | 0.12 | 0.014 |

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Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date May-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06-May | 3729 Melrose Ter | 0 | 0 | 0 | 0 | 11 | 6.5 | 0.02 | 186 | 0.2 | 392 | 0.18 | 0.026 |
| 21-May | Pumphouse | | | 0 | 0 | 16 | 6.5 | 0.01 | 188 | 0.2 | 393 | | |
| 27-May | 3729 Melrose Ter | | | 0 | 0 | 15 | 6.7 | 0.01 | 196 | 0.2 | 409 | | |
| | Average | 0 | 0 | 0 | 0 | 14.0 | 6.6 | 0.01 | 190.0 | 0.2 | 398.0 | 0.18 | 0.026 |
| | Maximum | 0 | 0 | 0 | 0 | 16 | 6.7 | 0.02 | 196 | 0.2 | 409 | 0.18 | 0.026 |
| | Minimum | 0 | 0 | 0 | 0 | 11 | 6.5 | 0.01 | 186 | 0.2 | 392 | 0.18 | 0.026 |

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Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Jun-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-Jun | 3729 Melrose Ter | 0 | 0 | 0 | 0 | 15 | 6.4 | 0.02 | 191 | 0.2 | 402 | 0.12 | 0.018 |
| 11-Jun | Pumphouse | | | 0 | 0 | 14 | 6.6 | 0.02 | 193 | 0.2 | 406 | | |
| 17-Jun | 3847 Melrose Ter | | | 0 | 0 | 17 | 6.5 | 0.03 | 194 | 0.2 | 405 | | |
| 24-Jun | 3729 Melrose Ter | | | 0 | 0 | 16 | 6.4 | 0.02 | 194 | 0.2 | 406 | | |
| | **Average** | 0 | 0 | 0 | 0 | 15.5 | 6.5 | 0.02 | 193.0 | 0.2 | 404.8 | 0.12 | 0.018 |
| | **Maximum** | 0 | 0 | 0 | 0 | 17 | 6.6 | 0.03 | 194 | 0.2 | 406 | 0.12 | 0.018 |
| | **Minimum** | 0 | 0 | 0 | 0 | 14 | 6.4 | 0.02 | 191 | 0.2 | 402 | 0.12 | 0.018 |

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines
Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Jul-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02-Jul | 3729 Melrose Ter | 0 | 0 | | | | | | | | | | |
| 09-Jul | Pumphouse | | | 0 | 0 | 18 | 6.6 | 0.02 | 193 | 0.2 | 404 | 0.11 | 0.016 |
| 15-Jul | 3847 Melrose Ter | | | 0 | 0 | 17 | 6.8 | 0.02 | 189 | 0.2 | 396 | | |
| 22-Jul | 3729 Melrose Ter | | | 0 | 0 | 19 | 6.5 | 0.02 | 183 | 0.2 | 385 | | |
| 29-Jul | Pumphouse | | | 0 | 0 | 17 | 6.6 | 0.01 | 186 | 0.2 | 390 | | |
| | Average | 0 | 0 | 0 | 0 | 17.8 | 6.6 | 0.02 | 187.8 | 0.2 | 393.8 | 0.11 | 0.016 |
| | Maximum | 0 | 0 | 0 | 0 | 19 | 6.8 | 0.02 | 193 | 0.2 | 404 | 0.11 | 0.016 |
| | Minimum | 0 | 0 | 0 | 0 | 17 | 6.5 | 0.01 | 183 | 0.2 | 385 | 0.11 | 0.016 |

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines
Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Aug-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06-Aug | 3729 Melrose Dr | 0 | 0 | BG | 0 | 17 | 6.5 | 0.01 | 186 | 0.2 | 390 | 0.09 | 0.016 |
| 12-Aug | Pumphouse | | | 0 | 0 | 18 | 6.5 | 0.03 | 187 | 0.2 | 393 | | |
| 19-Aug | 3847 Melrose | | | 0 | 0 | 21 | 6.5 | 0.01 | 186 | 0.2 | 391 | | |
| 26-Aug | Pumphouse | | | 0 | 0 | 16 | 6.9 | 0.02 | 177 | 0.2 | 375 | | |
| | **Average** | 0 | 0 | 0 | 0 | 18.0 | 6.6 | 0.02 | 184.0 | 0.2 | 387.3 | 0.09 | 0.016 |
| | **Maximum** | 0 | 0 | 0 | 0 | 21 | 6.9 | 0.03 | 187 | 0.2 | 393 | 0.09 | 0.016 |
| | **Minimum** | 0 | 0 | 0 | 0 | 16 | 6.5 | 0.01 | 177 | 0.2 | 375 | 0.09 | 0.016 |

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* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Sep-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03-Sep | 3729 Melrose | 0 | 0 | | | | | | | | | | |
| 16-Sep | 3847 Melrose | | | 0 | 0 | 20 | 6.5 | 0.02 | 186 | 0.2 | 388 | 0.12 | 0.017 |
| | Average | 0 | 0 | 0 | 0 | 20.0 | 6.5 | 0.02 | 186.0 | 0.2 | 388.0 | 0.12 | 0.017 |
| | Maximum | 0 | 0 | 0 | 0 | 20 | 6.5 | 0.02 | 186 | 0.2 | 388 | 0.12 | 0.017 |
| | Minimum | 0 | 0 | 0 | 0 | 20 | 6.5 | 0.02 | 186 | 0.2 | 388 | 0.12 | 0.017 |

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Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Oct-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07-Oct | 3729 Melrose Ter | 0 | 0 | 0 | 0 | 15 | 6.5 | 0.02 | 18.3 | 0.2 | 386 | 0.12 | 0.017 |
| 15-Oct | Pumphouse | | | 0 | 0 | 12 | 6.5 | 0.02 | 183 | 0.2 | 385 | | |
| 21-Oct | 3847 Melrose Ter | | | 0 | 0 | 12 | 6.5 | 0.03 | 185 | 0.2 | 388 | | |
| 29-Oct | 3729 Melrose Ter | | | 0 | 0 | 13 | 6.4 | 0.01 | 189 | 0.2 | 399 | | |
| | Average | 0 | 0 | 0 | 0 | 13.0 | 6.5 | 0.02 | 143.8 | 0.2 | 389.5 | 0.12 | 0.017 |
| | Maximum | 0 | 0 | 0 | 0 | 15 | 6.5 | 0.03 | 189 | 0.2 | 399 | 0.12 | 0.017 |
| | Minimum | 0 | 0 | 0 | 0 | 12 | 6.4 | 0.01 | 18.3 | 0.2 | 385 | 0.12 | 0.017 |

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Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Nov-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04-Nov | 3729 Melrose Ter | 0 | 0 | 0 | 0 | 12 | 6.4 | 0.01 | 188 | 0.2 | 396 | 0.38 | 0.14 |
| 12-Nov | Pumphouse | | | 0 | 0 | 12 | 6.7 | 0.02 | 186 | 0.2 | 391 | | |
| 18-Nov | 3847 Melrose Ter | | | 0 | 0 | 11 | 6.8 | 0.01 | 189 | 0.2 | 397 | | |
| 25-Nov | 3729 Melrose Ter | | | 0 | 0 | 12 | 6.7 | 0 | 199 | 0.2 | 417 | | |
| | Average | 0 | 0 | 0 | 0 | 11.8 | 6.7 | 0.01 | 190.5 | 0.2 | 400.3 | 0.38 | 0.14 |
| | Maximum | 0 | 0 | 0 | 0 | 12 | 6.8 | 0.02 | 199 | 0.2 | 417 | 0.38 | 0.14 |
| | Minimum | 0 | 0 | 0 | 0 | 11 | 6.4 | 0 | 186 | 0.2 | 391 | 0.38 | 0.14 |

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Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report

| Date Dec-08 | Sample Location (Address) | Fecal Coli * Health Dep | Total Coli * Health Dep | Total Coli RDN | E Coli RDN | Temp $^{o}$ C | pH | $Cl_2$ ppm | TDS ppm | Sal % | Cond uS/cm | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02-Dec | 3729 Melrose Ter | 0 | 0 | 0 | 0 | 11 | 6.5 | 0.01 | 211 | 0.2 | 445 | 0.06 | 0.123 |
| 09-Dec | Pumphouse | | | 0 | 0 | 9 | 6.5 | 0.02 | 219 | 0.2 | 462 | | |
| | Average | 0 | 0 | 0 | 0 | 10.0 | 6.5 | 0.02 | 215.0 | 0.2 | 453.5 | 0.06 | 0.123 |
| | Maximum | 0 | 0 | 0 | 0 | 11 | 6.5 | 0.02 | 219 | 0.2 | 462 | 0.06 | 0.123 |
| | Minimum | 0 | 0 | 0 | 0 | 9 | 6.5 | 0.01 | 211 | 0.2 | 445 | 0.06 | 0.123 |

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines
Coliforms are measured in colony forming units (CFU) per 100 millilitres of water
* Yellow Column Coliform tests are done by Health Department
Green tests are completed by RDN

**Comments:**

**Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.**

# APPENDIX C

# EMERGENCY RESPONSE PLAN

* Emergency Response Plan not included in Public Copy.