



Making a difference...together

**HIGHLAND WATER AND SEWER LOCAL SERVICES COMMITTEE  
FERNWOOD WATER LOCAL SERVICE COMMITTEE  
2009 OPERATIONS REPORT  
MAY 26, 2009**

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The following information is provided for the Fernwood and Highland water services and the Maliview sewer service. Although the Fernwood water service is administered through a separate committee from the Highland water service and the Maliview sewer service, the two committees will merge to form a single committee upon completion of a new shared water treatment plant, anticipated in 2011. It is proposed that the committees meet jointly in the interim as the project is in progress.

### **Maliview Sewer Operations**

Effluent quality from the Maliview wastewater treatment plant has generally complied with of the BC Municipal Sewerage Regulation in the past year, except a single event in March 2009 related to an operational problem. Inflow and infiltration of rainwater and shallow groundwater (I&I) into the collection system is an ongoing problem, causing wet weather flows to occasionally exceed the registered capacity of the system. It is likely that the majority of inflow of stormwater to the system is related to individual service connections, such as roof leaders, foundation drains or basement sump pumps improperly connected to the sewer system.

To protect the main plant from washing out during these high flow periods, a supplementary screening process has been installed. All sewage flow in excess of the design capacity of the treatment plant is now routed through a very fine screen. As flows in excess of the treatment plant capacity are heavily diluted with groundwater and stormwater, the screen removes a nominal quantity of material each day, however after several months of operation the volume of screening material removed was higher than anticipated and staff determined the quality of the effluent produced by the screening process did not meet the sewage regulations.

A settling tank was installed in 2008 to remove fine solids, enabling the system to comply with regulatory requirements in wet weather overflow conditions. A biofilter was also constructed in order to reduce odours from the process. These modifications have achieved the intended purposes, resulting in regulatory compliance and greatly reduced odour complaints. However, the project budget was significantly exceeded, requiring the Maliview sewer service to carry an operating deficit of \$13,479 into 2009 in order to recover unfunded project costs.

Reducing I&I through improvements to the collection system remains a high priority for capital planning. Staff will work with the committee in the 2010 budget process to develop a capital plan to address I&I.

### **Highland Water Operations**

Despite its age and condition, the existing Highland water treatment plant continues to produce drinking water that meets regulatory requirements, with the exception of turbidity often in excess of 1.0 NTU in summer. However, the plant is unreliable and maintenance-intensive, requiring emergency repairs on several occasions in the past year. The distribution system is also showing its age. A major leak was discovered in summer 2008, which required several weeks of engineering and operational effort to locate and repair. Based on water production and consumption records, the leak likely accounted for at least 270 litres per minute (60 gallons per minute) by the time it was located and repaired. The leak was caused by arbutus tree roots that had grown alongside the main in the bedding material, slowly causing stress on the main to the point that it failed.

## **Fernwood Water Operations**

Like the Highland system, the Fernwood water treatment plant produces drinking water that meets regulatory requirements, with the exception of summer turbidity. However, the plant is newer and in better condition, so is less maintenance intensive in operation. The Fernwood distribution system is of similar age and condition to the Highland system, and has also required repairs to watermain leaks and breaks from time to time.

## **Highland-Fernwood Capital Project**

The Highland Water and Sewer Local Services Committee (HWSLSC) initiated a capital project in 2006 to replace its aging water treatment plant with a new plant that meets current drinking water quality standards. The new treatment plant is designed to meet a new Vancouver Island Health Authority treatment standard for surface water sources (i.e. lakes, rivers or streams). The new standard, called the 4.3.2.1 Policy, requires that a drinking water treatment process for a surface water source must:

- Achieve a four-log (99.99%) reduction in viruses from source water
- Achieve a three-log (99.9%) reduction in Giardia cysts and Cryptosporidium oocysts
- Include a minimum of two stages of treatment, typically filtration and disinfection
- Achieve a maximum turbidity of 1.0 NTU in treated water (turbidity is a measure of suspended particles in the water, measured by transmission of light through a sample of water)

The new plant will meet the 4.3.2.1 Policy using a treatment process based on dissolved air flotation (DAF), which is very well suited to the high algae content typical of the lakes in the Gulf Islands. The DAF process is followed by filtration and two-stage UV and chlorine disinfection, with a provision to add potassium permanganate as needed to neutralize toxins that can be produced by some algae blooms. Similar systems will begin operation for the Beddis and Fulford systems on Salt Spring in the summer of 2009.

The new Highland treatment plant was originally expected to be completed using capital funds on hand supported by a federal-provincial grant. However, due to significant unplanned expenses in 2008 to resolve the major distribution leak, and in consideration of the need to complete several distribution upgrades in the next few years, in the fall of 2008 the HWSLSC agreed to expand and refinance the project. In order to proceed with the expanded project, by referendum on 21 March 2009 the Highland electors authorized the Capital Regional District (CRD) to borrow up to \$559,000 over 15 years through the Municipal Finance Authority (MFA). The Highland borrowing is expected to be funded without an increase from the current parcel tax level.

Although the Fernwood water treatment plant has provided acceptable water quality for several years, the process does not meet recently introduced water quality requirements of the Vancouver Island Health Authority (VIHA), and proved only marginally effective in dealing with extensive algal blooms recently experienced on St. Mary Lake. The federal-provincial infrastructure grant approved for the Highland service includes more than half of the cost of interconnecting the Fernwood system, which would eliminate the need to replace or conduct a major upgrade to the Fernwood water treatment plant. The Fernwood Water Local Service committee (FWLSC) agreed to proceed with plans to interconnect the two systems. In order to interconnect the systems, by referendum on 21 March 2009 the Fernwood electors authorized the CRD to borrow up to \$195,000 over 15 years through the Municipal Finance Authority (MFA). The Fernwood borrowing is expected to be funded without an increase from the current parcel tax level.

The upgrades will include interconnection of the two systems, creating a single system served by a new water treatment plant. Connecting both water services to the new plant will significantly reduce operating costs per customer compared to the operation of the two existing plants. As the two services would be operated as one after the upgrades are completed, it has been agreed by both local service committees that the systems be

upgraded to a similar standard. The cost of these upgrades is also included in the borrowing for each service.

*Project Scope and Timeline*

The project consists of the following main elements, with an approximate timeline shown in Table 1:

1. Construct a new DAF water treatment plant adjacent to the existing Fernwood treatment plant.
2. Construct an interconnecting pipeline along the bottom of St. Mary Lake from the new treatment plant to the existing Highland water treatment plant site.
3. Replace aging water meters in both systems with new meters fitted with radio read components.
4. Install additional isolation valve clusters in both distribution systems to simplify maintenance.
5. Replace the Maliview pressure reducing valve (PRV) station in the Highland system.
6. Replace the liner in the Middle Reservoir on the Highland system, and provide standby power for pumps at the reservoir site.

Table 1. Estimated Project Timeline

<b>Item</b>	<b>Description</b>	<b>Approximate Completion Date</b>
1	Select and purchase major components for treatment plant	Complete, awaiting delivery
2	Complete design of water treatment plant	Complete
3	Tender underwater interconnect pipeline	9 June 2009
4	Obtain final approval for Fernwood plant site from MOT	July 2009
5	Obtain lease for interconnect pipeline under St. Mary Lake	July 2009
6	Tender construction of plant	August 2009
7	Complete interconnect pipeline	Oct 2009 (fisheries dependent)
8	Construct plant building, install major components	April 2010
9	Mechanical and electrical connections in treatment plant	August 2010
10	Commission water treatment plant	December 2010
11	Complete meter and valve installations	December 2010
12	Replace Maliview PRV station	December 2011
13	Replace Middle Reservoir liner	December 2011
14	Complete backup power installation at Middle Reservoir	December 2011

*Project Cost Recovery*

The cost to complete the project will be recovered through a combination of a federal/provincial grant, funds held in reserve by both services, and funds borrowed by each service. Two thirds of the cost of the new water treatment plant will be recovered through the federal/provincial grant, and the remainder will be shared equally per parcel in the two service areas (the cost is split between the services based on the number of parcels per service). Most of the cost of the interconnecting pipeline will also be recovered through the grant, with the remainder split equally between the two services. Highland distribution system upgrades will be paid from Highland debt, and Fernwood distribution upgrades will be paid from Fernwood debt. Although the referendum authorized the borrowing of up to \$559,000 for the Highland service, it is anticipated that only \$401,000 will be borrowed since the Fernwood referendum also passed, as the Fernwood service will assume a share of the overall cost (Table 2).

The Highland borrowing will cost approximately \$44,000 annually for 15 years. This will be accommodated without an increase in taxes or fees from current levels, using capital budget already assigned to the project. The Fernwood borrowing will cost approximately \$21,000 annually for 15 years. Although this will result in an increase in the budget allocated for capital, the reduction in operating cost achieved by combining the two services to a single plant will easily offset the increase in capital expense for customers of both service areas.

Table 2. Project Cost Sharing Structure

Item	Total Cost	Highland Share	Fernwood Share	Fed/Prov. Grant
Water plant upgrade	1,275,900	325,380	99,920	850,600
Interconnection pipeline	200,000	46,500	46,500	107,000
Valves and System Upgrades	433,000	363,000	70,000	
Referendum	10,000	5,000	5,000	
Total project cost	1,918,900	739,880	221,420	957,600
Funding from reserve	(365,620)	(339,200)	(26,420)	
<b>New debt required</b>	<b>595,680</b>	<b>400,680</b>	<b>195,000</b>	

### Combining the Highland and Fernwood Water Services

When the capital project is complete, the Fernwood and Highland water systems will be connected to a single new water treatment plant, thereby becoming one system within three years. With upgrades to both distribution systems completed as part of the project funded by the borrowing, both systems will be comparable in terms of age and condition. The cost to operate the two distribution systems will be similar, and the cost of treatment will be shared based on the number of connections per system.

The committees have agreed to begin the process of combining the two services for the purpose of operation and future capital works, maintaining the separate service areas strictly for the purpose of servicing the debt associated with the new treatment plant and distribution upgrades. The existing service areas will cease to exist when the debt is repaid 15 years after the work is completed (year 2026). The two existing committees will be merged to form a single new local service committee representing the combined service area. A proportion of the committee members will need to be residents of the Maliview sewer area in order to govern that service, as is the case with the existing Highland committee. Combining the services will significantly reduce the cost of governance and administration.

The cost to operate a combined Highland Fernwood water system, including a single new treatment plant, is estimated to be \$434 per connected residential parcel. An additional parcel tax of approximately \$180 per parcel in the Highland area and \$290 in the Fernwood area will remain in place for 15 years after the project is completed to recover the cost of borrowing approved by the March 21 referenda. The total annual costs of about \$615 per residential connection in the Highland area and \$725 in the Fernwood area would be approximately \$40 and \$105 less than current costs, respectively.

### Water Supply and Demand

Monthly water production for the Highland and Fernwood systems is shown in Figure 1. In total, 103,370 and 23,358 cubic metres (m<sup>3</sup>) of water was abstracted from St. Mary Lake in 2008 for the Highland and Fernwood services, respectively. Fernwood production was slightly less than in 2007, but Highland production was 28% greater as a result of the major distribution leak.

Both systems are fully metered, and meters are read quarterly. Meter data enables water production and consumption to be compared in order to estimate leakage losses in the distribution system. The difference between production and total metered consumption is called non-revenue water. Non-revenue water is not strictly related to distribution leaks, but also includes meter error (older meters tend to under-read usage as they wear) and unmetered uses such as fire hydrant usage and distribution system maintenance. Non-revenue water in 2008 was 55,602 and 8,119 m<sup>3</sup>, or 52% and 34% of overall production, for the Highland and Fernwood systems respectively. While Fernwood losses are significantly higher than what is considered to be best practice for distribution system management, they are typical of the larger distribution systems in the Gulf Islands. Highland losses in 2008 were greater than would be considered acceptable for any system due to the

leak repaired in the summer, but are expected to be much lower in 2009 with the leak repaired. Non-revenue water by billing period is shown in Figure 2.

The average single-family residence in the Highland and Fernwood areas area used 219 and 208 m<sup>3</sup> respectively in 2008, which is similar to other CRD water service areas on Salt Spring Island with surface water sources. For comparison, two services on Salt Spring with severely limited groundwater sources average 100-120 m<sup>3</sup>/year per customer. A distribution of water use per customer for the Beddis area is shown in Figure 3.

Figure 1. Water Production by Month, 2005-2008

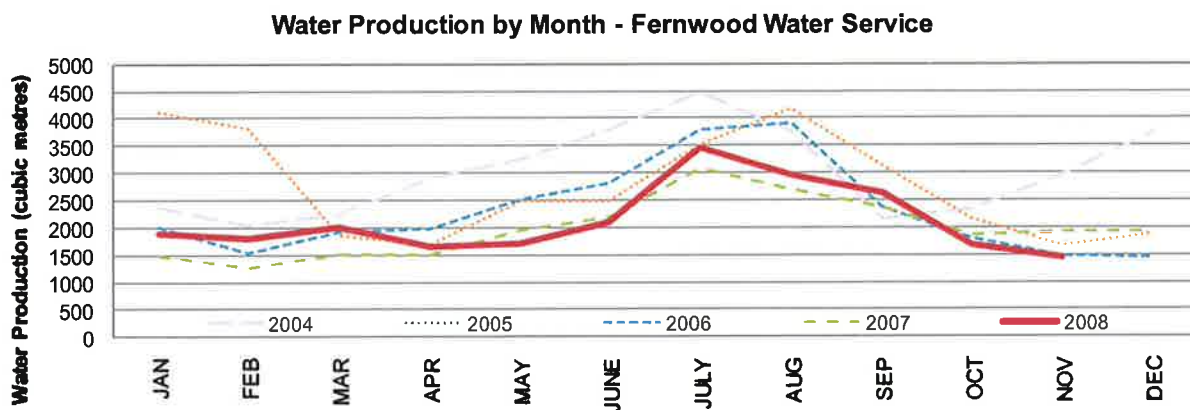
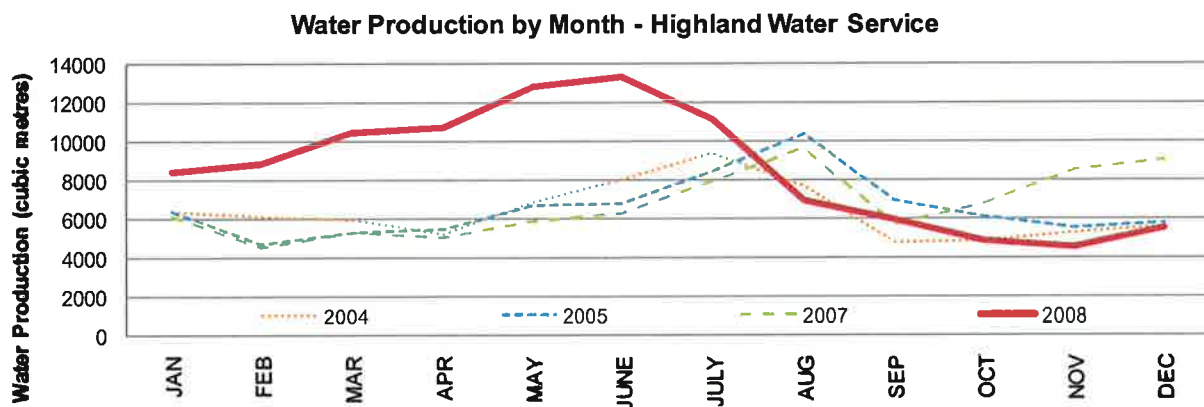


Figure 2. Non-Revenue Water, 2007-2008

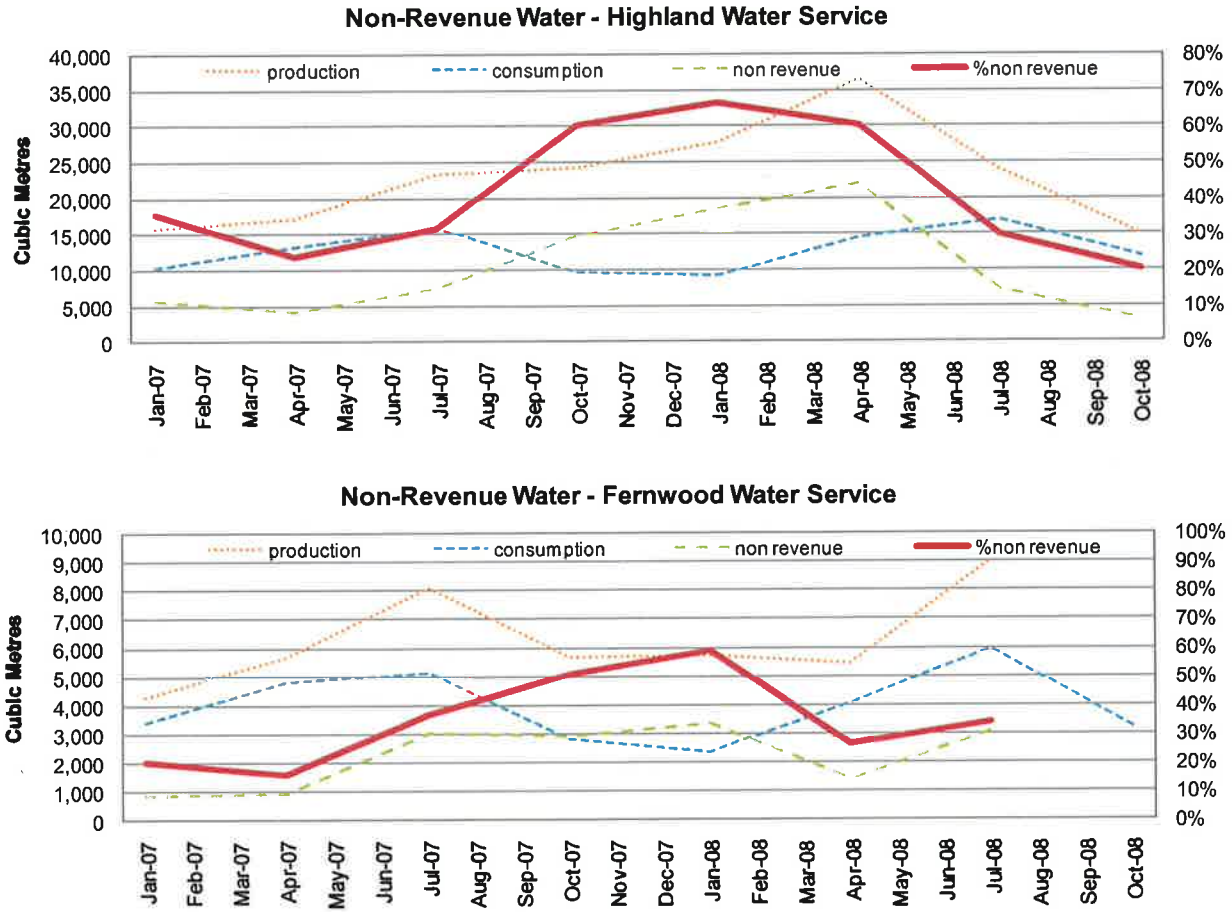
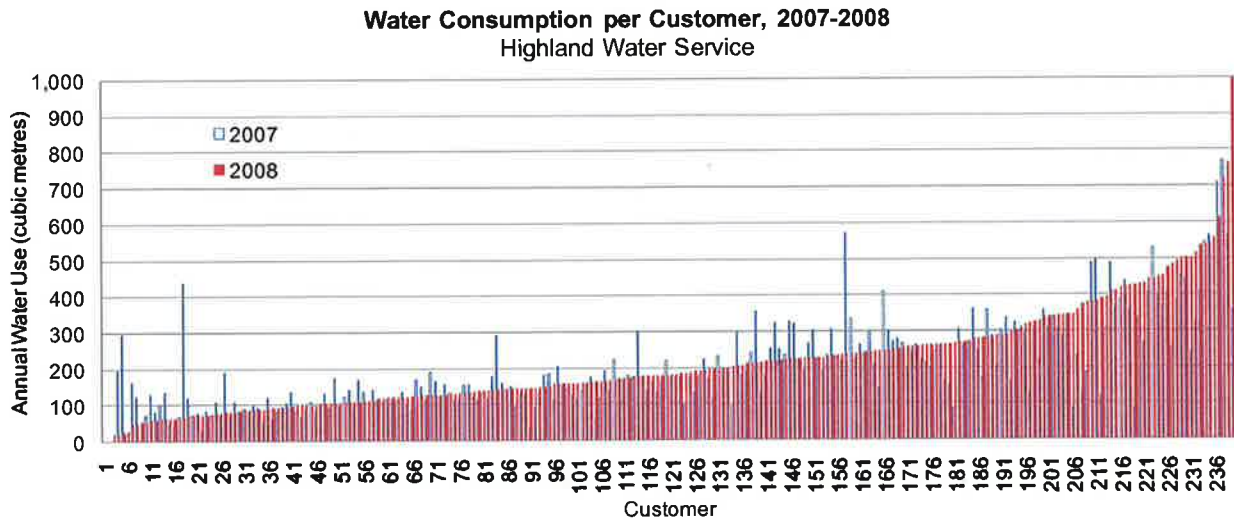
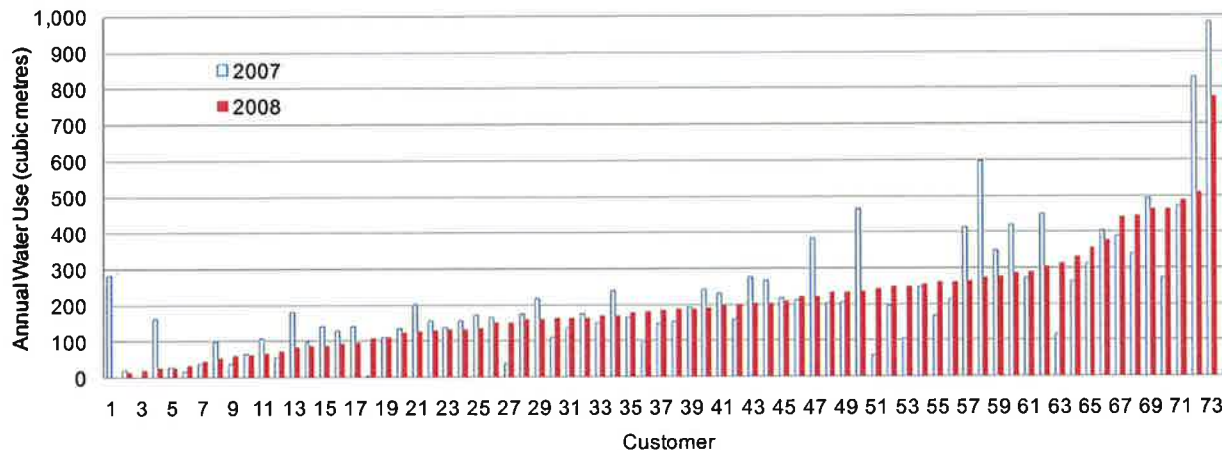


Figure 3. Water Consumption by Customer, 2007-2008



Water Consumption per Customer, 2007-2008  
 Fernwood Water Service



**Financial Reports**

Attached are copies of the *Statement of Financial Activities* as prepared by the CRD Finance and Corporate Services for the year 2008, for the Fernwood, Highland and Maliview services. The statements provide an overview of the revenues and expenditures for the year. Revenues are generated primarily through parcel taxes and user fees (fixed and variable based on water use), and small amounts for interest on savings and miscellaneous revenue such as late payment charges.

Expenditures include all costs to administer the service. General government services are charges levied by CRD Corporate Services for the financial processing of the budget and collection of fees and charges. Other includes all expenses needed for the operation of the service including all CRD labour costs for day to day operations, CRD service personnel hours performing maintenance and repairs, chemicals, electricity, water testing costs, maintenance parts allowances for electrical and mechanical equipment, rental or equipment as necessary and allowances for technical and staff support to the committee, and for the payment of debt.

The difference between revenue and expense is added to any surplus or deficit carried forward from the prior year. If there is a significant surplus, funds may be transferred to a reserve or capital project account. The surplus or deficit balance after any transfers is carried to the following year. Regional District services are not permitted to plan to carry forward a deficit, so a deficit in a given year usually requires a tax or fee increase in the following year to recover costs and prevent a subsequent deficit.

*Maliview Sewer Service*

The revenue of \$72,491 includes \$28,835 parcel tax and \$42,886 user fees. The total expenditures for 2008 were \$55,147, of which \$10,000 is the annual cost of borrowing for capital work, and the remainder is the cost of operation and administration of the service. Budgeted revenue was significantly greater than operating expenses in order to directly fund capital improvements of \$11,254.

The difference between revenue and expenditures in 2008 amounted to a net revenue of \$17,344 at year-end, which included the planned capital funding. This amount added to the surplus of \$4,414 carried forward from 2007. Due to a significant overrun in capital upgrade costs, a transfer of \$35,237 to the capital project was required in order to reconcile the capital account at year-end, resulting in the requirement to carry forward a deficit of \$13,479 to 2009. The current balance in the reserve fund is zero.

Parcel tax or user fee levels for the Maliview Sewer Service may need to increase in 2010 in order to cover



operating expenses and to fund planned sewer rehabilitation work to reduce inflow and infiltration.

*Highland Water Service*

The revenue of \$205,144 includes \$116,250 parcel tax and \$86,468 user fees. The total expenditures for 2008 were \$166,354, which does not include any borrowing costs as the Highland service currently carries no debt. Budgeted revenue was significantly greater than operating expenses in order to make a planned transfer of \$50,198 to the capital fund for the upgrade project.

The difference between revenue and expenditures in 2008 amounted to a net revenue of \$38,790 at year-end. This amount added to the surplus of \$29,973 carried forward from 2007. The planned transfer of \$50,198 to the capital fund resulted in a surplus of \$18,565 carried forward to 2009. The current balance in the capital reserve fund is \$34,741. No change in taxes or fees is anticipated for 2010.

*Fernwood Water Service*

The revenue of \$82,264 includes \$22,230 parcel tax and \$59,368 user fees. The total expenditures for 2008 were \$69,587, which does not include any borrowing costs as the Fernwood service currently carries no debt. Budgeted revenue was significantly greater than operating expenses in order to make a planned transfer of \$7,465 to the capital fund.

The difference between revenue and expenditures in 2008 amounted to a net revenue of \$12,677 at year-end. There was no balance carried forward from 2007. The planned transfer of \$7,465 to the capital fund resulted in a surplus of \$5,212 carried forward to 2009. The current balance in the capital reserve fund is \$27,096. No change in taxes or fees is anticipated for 2010.

CS:ls

Attachments: 3



# CAPITAL REGIONAL DISTRICT

## SEWER REVENUE FUND STATEMENT OF FINANCIAL ACTIVITIES (UNAUDITED) For the year ended December 31, 2008

	Maliview Estates Sewerage System
<b>REVENUES</b>	
Transfers from government	\$ 28,835
Sale of services	42,886
Other revenue from own sources:	
Building permits	-
Interest earnings	409
Other revenue	346
Grants in lieu of taxes	15
	<u>72,491</u>
<b>EXPENDITURES</b>	
General government services	2,410
Other	52,516
Other fiscal services	221
Recovery	-
	<u>55,147</u>
<b>NET REVENUES</b>	
<b>(EXPENDITURES)</b>	17,344
Transfers to own funds:	
Sewer Capital Fund	35,237
Reserve Funds	-
Equipment Replacement Fund	-
Transfers from own funds:	
Sewer Capital Fund	-
Reserve Funds	-
<b>CHANGE IN FUND BALANCE</b>	(17,893)
Opening balance	4,414
<b>CLOSING BALANCE</b>	<u>\$ (13,479)</u>

**CAPITAL REGIONAL DISTRICT**

**WATER REVENUE FUND  
STATEMENT OF FINANCIAL ACTIVITIES (UNAUDITED)  
For the year ended December 31, 2008**

	Salt Spring Island (Highland) Water Supply
<b>REVENUES</b>	
Transfers from government	\$ 116,250
Sale of services	86,468
Other revenue from own sources:	
Other licenses and permits	-
Interest earnings	732
Other revenue	1,631
Grants in lieu of taxes	63
	<u>205,144</u>
<b>EXPENDITURES</b>	
General government services	6,100
Other	159,578
Other fiscal services	676
	<u>166,354</u>
<b>NET REVENUES (EXPENDITURES)</b>	<b>38,790</b>
Transfers to own funds:	
Water Capital Fund	50,198
Reserve Funds	-
Equipment Replacement Fund	-
	<u>-</u>
<b>CHANGE IN FUND BALANCE</b>	<b>(11,408)</b>
Opening balance	29,973
<b>CLOSING BALANCE</b>	<b>\$ 18,565</b>

**CAPITAL REGIONAL DISTRICT**

**WATER REVENUE FUND  
STATEMENT OF FINANCIAL ACTIVITIES (UNAUDITED)  
For the year ended December 31, 2008**

	Fernwood Water Supply
<b>REVENUES</b>	
Transfers from government	\$ 22,230
Sale of services	59,368
Other revenue from own sources:	
Other licenses and permits	-
Interest earnings	37
Other revenue	629
Grants in lieu of taxes	-
	<u>82,264</u>
<b>EXPENDITURES</b>	
General government services	3,740
Other	65,505
Other fiscal services	342
	<u>69,587</u>
<b>NET REVENUES (EXPENDITURES)</b>	
	12,677
Transfers to own funds:	
Water Capital Fund	-
Reserve Funds	7,465
Equipment Replacement Fund	-
<b>CHANGE IN FUND BALANCE</b>	5,212
Opening balance	-
<b>CLOSING BALANCE</b>	<u>\$ 5,212</u>