



Making a difference...together

**MAGIC LAKE ESTATES WATER AND SEWER SERVICES
2014 ANNUAL REPORT
AUGUST 15, 2015**

Purpose of the Annual General Meeting

The agenda for the Annual General Meeting (AGM) is approved by the members of the committee. The purposes (and hence the agenda items) of the meeting are:

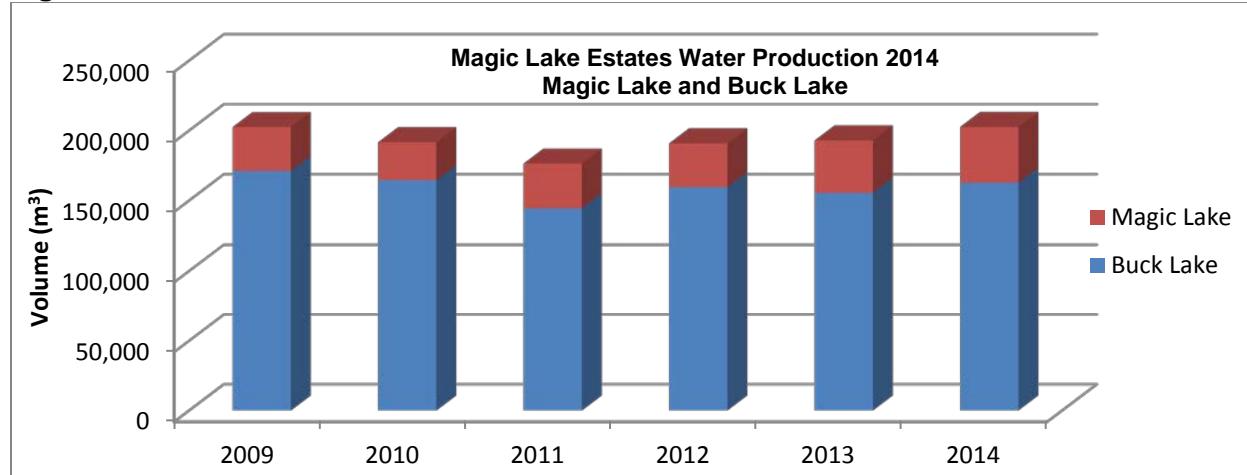
- To have the last year's AGM minutes approved (by committee members), and to present reports on the work of the Committee on, the past year's operation, maintenance, capital upgrades and financial information of the service to the service residents and owners,
- To nominate members for appointment to the Committee, and
- To enable the public to share comments on subjects which relate to the work of the Committee. The Committee can identify (under "new business") issues on which it wants feedback at the meeting. Motions raised by the public at the AGM will be considered by the committee at a subsequent regular meeting.

DRINKING WATER SYSTEM

Water Supply and Demand

Total annual water production through the two Magic Lake Estates (MLE) water treatment plants in 2014 was 202,581 m³, an increase of 9,624 m³ or 4.8% from 2013, largely attributable to the process and commissioning the new water treatment plant and raw water pump stations. The total annual consumption from the two raw water sources (Buck Lake and Magic Lake) since 2009 is shown in **Figure 1** below.

Figure 1 – Total Water Production 2009-2014



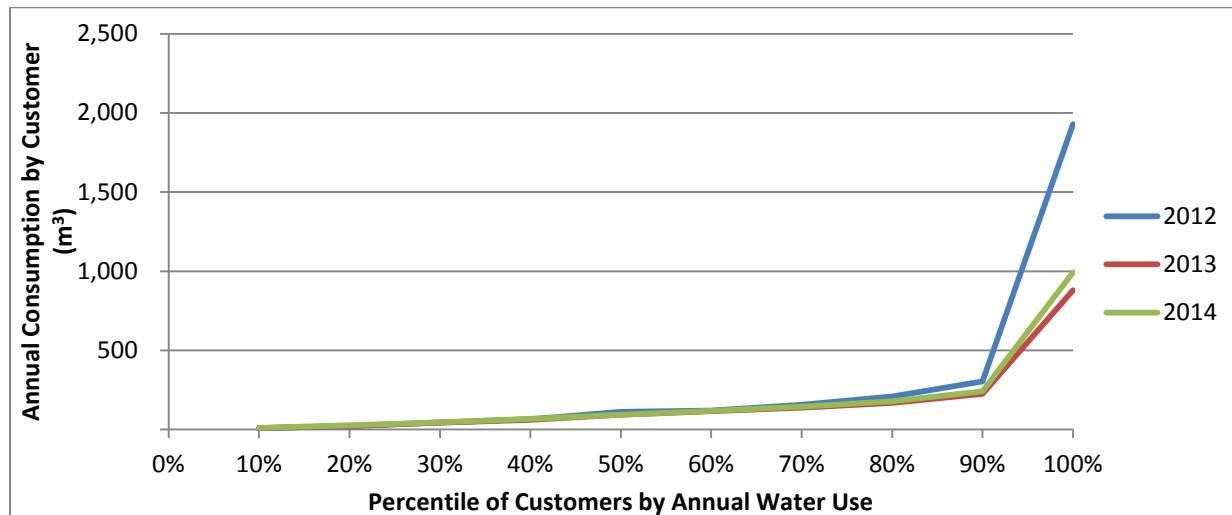
Since June 2010, customer water meters are read quarterly and in July 2013, consumption billing was initiated. The total amount of water delivered to customer connections in 2014 was 122,330 m³, or an average of 121 m³ per connection based on 1,011 connections; up from the 114 m³ consumer average in 2013, equating to an average increase of 6.1%. A portion of the increase can be attributed to customer side leaks identified during the year.

The difference between total production through the water treatment plants and total metered customer use is referred to as non-revenue water and in 2014 was 87,279 m³ (corrected for private side leaks) or 43.1% of total production. Although this is considered high compared to other similar systems, there was a 3.6% increase over 2013, likely attributable to the commissioning of the water treatment plant; 2013 non-revenue was 39.5%.

The difference in the volume of raw water extracted from the lakes and the volume of treated water consumed by the customers is considered non-revenue water. This includes water loss from the pipe network through leaking fittings, pipe joints, loss due to the automatic micro-flushing units that were installed to purge water for enhanced quality in dead-ended water mains, manual flushing to enhance water quality related customer complaints, commissioning of the new water treatment plant and filling and draining activity related to the new Frigate tank work, water service leaks, hydrant maintenance and exercising and water use by the fire department as needed. Recognising the high amount of water loss, the CRD staff are quantifying the water use per activity in order to identify, correct and reduce water loss where possible.

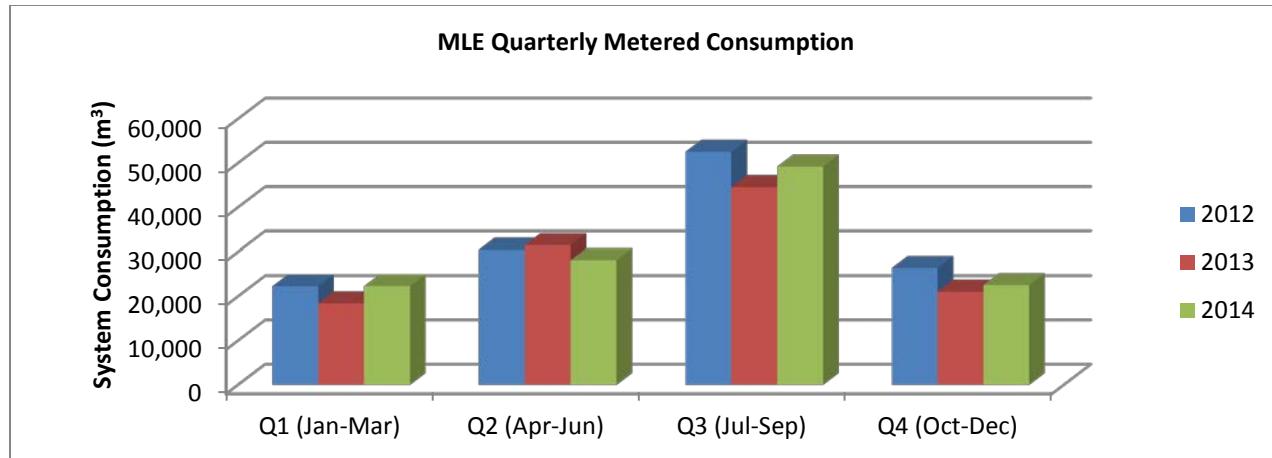
In order to encourage water conservation and to address issues of fairness, the Magic Lake Estates Water and Sewer Local Services Committee decided to implement consumption based billing effective July 1, 2013. The variation in water usage by customers in 2012 - 2014 is shown in **Figure 2**. This figure shows there is a noticeable decrease in water consumption by the higher end users in the service area in recent years.

Figure 2: Variation in Customer Consumption 2012 - 2014.



A quarterly consumption comparison for 2012 – 2014 is provided in **Figure 3**.

Figure 3: 2012 – 2014 Consumption Comparison by Quarterly Billing Cycle



The new consumption charges were approved by the CRD Board under Bylaw No. 3892 (March 2013). The quarterly water bills are comprised of the following charges:

- a \$62.50 fixed fee (payable by all water users – includes the first 50 m³ of water)
- \$0.50/ m³ charge for usage over 50 m³ and up to 80 m³
- \$1.00/ m³ charge for usage over 80 m³

Drinking Water Quality – 2014

In April of 2014, the CRD commissioned the new Dissolved Air Flotation (DAF) treatment plant that now combines the two intake lines from Buck Lake and Magic Lake. Between June and December 2014, water was exclusively taken from Buck Lake due to water quality (geosmin – taste and odour) issues associated with Magic Lake in June 2014.

While the water was safe for consumption throughout 2014, there were some episodes of objectionable water discolouration. While some of these episodes were more localized and short term and attributable to operation and maintenance procedures on system components, in November and December, following a seasonal lake-turnover event in Buck Lake, significant amounts of water with elevated manganese concentrations (aesthetic/colour issue and is not a health issue) entered the distribution system and caused widespread discolouration of the drinking water. As a result of this event, the potassium permanganate treatment system was commissioned in January 2015 and additional water quality monitoring equipment was ordered.

Typical Magic Lake Estates drinking water quality characteristics for 2014 are summarized as follows:

- Both lake sources exhibited low concentrations of total coliform and *E. coli* bacteria throughout the year.
- Only very low concentrations of parasitic cysts and oocysts were detected in the raw source water from Buck or Magic Lake in 2014;
- Raw water from both sources was slightly hard (~70 mg/L CaCO₃) and slightly basic (pH 7.8 – 8.5).
- Both lakes exhibited elevated iron and especially manganese concentrations which typically spiked after lake-turnover events.

- Treated water was bacteriologically safe to drink.
- Treated water turbidity (cloudiness) was well below the *Guidelines for Canadian Drinking Water Quality* (GCDWQ) limit of 1 nephelometric turbidity units (NTU);
- Total organic carbon (TOC median 4.39 mg/L) was lower than historical levels indicating that the DAF plant is more effective in removing TOC than the old plant; there are presently no limits stated in the GCDWQ.
- Disinfection by-products such as trihalomethanes (THM) did not exceed the GCDWQ limit of 100 mg/L.
- Metals were typically below maximum acceptable concentration (MAC) limits with the exception of manganese during some of the episodes of discolouration (aesthetic issue).
- Both water sources were subject to algal blooms that periodically affected taste and odour.

Water Quality data collected from this drinking water system can be reviewed on the CRD website:

<https://www.crd.bc.ca/about/data/drinking-water-quality-reports/southern-gulf-islands-water-quality-reports/magic-lake-estates-water-quality-reports>

Operations: 2014

In 2014 significant water system capital upgrades were completed that included the construction and commissioning of a new water treatment facility, the replacement of the primary water storage facility on Frigate Road and the replacement of water mains. As a result of this capital work, operations staff was kept extremely busy assisting with various capital project tasks that included but not limited to; responding to contractor requests, attending project meetings, review of project information and attending operator training sessions. During the construction and commissioning period operations staff ensured the water system continuously operated with minimal interruption to the community.

During 2014, the Magic Lake Estates (MLE) water system for the most part operated reliably however there were some significant events that included:

- **October 19, 2014:** A sewer system overflow on Tiller Crescent resulted in small amount of sewage making its way into the primary drinking water source (Buck Lake Reservoir), resulting in an emergency response that included; notifications to the Magic Lake Estates Committee, local Health Authority, and the public; daily raw water and treated water sampling and bacteriological testing; changes to the water treatment process including increasing the chlorine dosage.
- **October 29, 2014.** Two significant water main breaks occurred; one on Dory Road and one at the intersection of Galleon Way and Keel Crescent (less than 6 hours apart) resulting a water system shutdown and disruption to water service for a significant number of water system users.
- Various times throughout the year, after commissioning the new treatment facility, operations responded to complaints of brown water. As a result significant, water system flushing activities were conducted.

Some significant operation and maintenance activities included:

- Inspection and cleaning of the Buck Lake raw water intake screens including the removal and replacement of the foot valve (required divers).
- Troubleshooting and repairs at Dory pressure regulating station.

- Repairs at Capstan pressure regulating station.
- Installed water service connection on Foc'sle Road.
- Repaired minor water main breaks on Foc'sle Road, Schooner Way, Galleon Way and Dory Way.
- Repaired water service leaks on Privateers Road, Schooner Way and Capstan Lane.

Water System Capital Improvements Update

Water Treatment Plant Project Upgrade

The new water treatment plant was commissioned in 2014 and the Frigate storage tank was commissioned in January of 2015, which was the final item of construction related to the project.

In summary, the project included the following work:

- A new water treatment plant consisting of pre-oxidation, clarification by dissolved air flotation, filtration, and two means of disinfection including ultraviolet light and chlorine (design capacity of approximately 1,690 cubic metres per day or 365,000 Imperial gallons per day),
- Two raw water pump stations one each located at Buck Lake and Magic Lake,
- Installation of raw (1,787 metres) and treated (1,341 metres) water mains,
- Retrofit of the Bosun valve and pump station, and
- Frigate storage tank replacement, total volume of 750 cubic metres (165,000 Imperial gallons).

In 2009, the electors in the MLEWSA authorized, by referendum (Bylaw 3633), the borrowing of \$2,560,000 to fund the estimated costs of the works, facilities and equipment for both the water treatment plant upgrade and the Buck Lake dam improvement (spillway installation). A Federal/Provincial grant was awarded to the CRD in the amount of \$5,250,000 under the Building Canada Fund specifically for the water treatment project. The total approved funding for the water system improvements is \$8,812,500.

Although the construction activities have been completed the final project costs and payments to the contractors are yet to be finalized and as of July 2015 it is expected that the project will be completed within the overall project budget. More specific project details are available by referring to the reports posted on the CRD website at:

<https://www.crd.bc.ca/about/how-we-are-governed/committees-commissions-appointments/local-and-regional-utilities/magic-lake-estates-water-and-sewer-committee>

Future Water System Capital Improvements

2015 Capital Improvements:

The approved 2015 capital improvements, totaling \$123,000 include the following:

1. Air Valve Upgrades (\$8,000) – the existing air valves are old and are in need of replacing.
2. Signal Hill PRV Upgrade (\$50,000) – it is planned to upgrade the pressure reducing valve station.
3. Install Adjustable Intake on Magic Lake (\$20,000) – the raw water intake is fixed and it is proposed to install an adjustable intake to allow the operators to extract raw water from various depths. There is a similar adjustable intake on Buck Lake.

4. Magic Lake Dam Safety Upgrades (log boom and staff gauge) (\$5,000) – it is planned to install a staff gauge for lake depth measuring and a new log-boom to prevent floating debris from entering the spillway.
5. Buck Lake Building Alterations (\$40,000) – It is proposed to reutilize the old Buck Lake water treatment plant building for materials storage and it requires some alterations.

A project from 2014 that is in progress is the Magic Lake Dam Safety Upgrades (\$39,000) which includes the commissioning of a functioning siphon or drain at the Magic Lake dam and operating documentation.

2016 – 2019 Capital Improvements (included in the 2015 five-year budget)

1. Buck Lake east dam detailed design (2016 - \$120,000) - The preliminary design report related to the Buck Lake east dam section was delivered by the consultant in 2015 and will help guide the logistics of remedial construction work (Item 4 below).
2. Schooner PRV Upgrade (2016 - \$50,000) - the existing valves are old and are in need of replacing.
3. Capstan PRV Upgrade (2017 - \$50,000) - the existing valves are old and are in need of replacing.
4. Buck Lake East Dam Remediation (2017 - \$1,000,000) – once the final design is completed then construction activity will commence to improve the dam stability under seismic loading.
5. Replace Distribution Infrastructure (\$100,000 each year for years 2017 to 2019) – proposed future water main replacement.

The MLEWSLSC will consider all of the proposed future capital at its budget meeting due to be held in September of 2015.

SEWER SYSTEM

Permit Compliance – Marine Discharges

Both the Schooner and Cannon wastewater treatment plants operated out of compliance with Ministry of Environment (MOE) issued registrations and permits at times during the past several years. The most persistent compliance issues relate to excessive flows during wet weather due to inflow and infiltration (rain-water entry and groundwater leaking into sewer collection system and is referred to as "I&I"). These I&I conditions has caused exceedances in the permitted daily discharge flow rates, and these excessive flow rates through the treatment plants can at times cause effluent quality limits also to be exceeded. In 2014 the Schooner plant was out of compliance with total daily flow limits for three months of the year, while the Cannon plant was out of compliance for 5 months of the year. Effluent quality limits were not exceeded at either facility in 2014.

Based on review of 2011-2013 results with MOE, routine scheduled sampling of the marine receiving waters around the outfalls is not required until 2016 unless there are planned bypasses, plant failures/overflows or wet weather overflows that exceed three days' duration in the winter or one day duration in the summer. In 2014, three marine receiving water sampling events were required for the Schooner facility: two following a planned bypass that took place to allow for clean-out of excess grit and debris from the aeration tank, and one following a heavy rain event. The receiving environment results from all three sampling events were below guidelines set to protect human primary contact recreation. No marine receiving water sampling was undertaken for the Cannon facility in 2014.

Operations: 2014

Aside from the wet weather problems already noted, the Schooner and Cannon wastewater treatment facilities continue to operate well considering their age. This is the result of undertaking more frequent preventative and routine maintenance activities and, in general, good wastewater treatment system operating practices performed.

Significant events included:

- **May 26, 2014:** The oxidation ditch at the Schooner Wastewater Treatment was drained cleaned and inspected. As a result of only having one oxidation ditch, authorization to bypass this treatment process was required from the Ministry of Environment.
- **November 5, 2014:** Annual sewer system flushing of the area surrounding Buck Lake. Significant root growth and grit buildup was removed from the sewer collection system.

Significant operation and maintenance activities included:

- Installed sewer service connection at #3603 Foc'sle Road.
- Investigate sewer service connection request for #3704 Starboard Crescent.
- Replacement of Foc'sle Road sewer access pigging chamber lid.
- Emergency response to various facilities as a result of electrical power outages due to a number of wind storm events throughout the inclement weather period.
- Flushing and inspection activities on the sewer collection system around Buck Lake. Removed significant root blockage.
- Capstan pumping station float repair.
- Schooner Wastewater Treatment Plant exterior lighting repairs.
- Tour conducted of wastewater treatment plants facilities for Federal Government.
- Troubleshooting Schooner Wastewater Treatment Plant foaming issues.
- Schooner Wastewater Treatment Plant air blower electrical motor replaced.
- Multiple callouts to the Schooner pumping station due to electrical trip-outs caused by pump ragging primarily due to flushable wipes.
- Vacuum truck cleared obstruction in the 6" discharge port at the Cannon Treatment Plant.
- Manhole repair near 3777 Schooner Way

Chart Drive Septic System

On April 14, 2014, the CRD received a written Order from Island Health to stop discharging to the Chart Drive Septic Field as a result of a failed field. The written Order is still in effect.

Actions taken to date include ongoing pump-out of the septic tank and trucking to the Schooner treatment plant at an approximate cost of \$1,000/week. The work to replace the failed septic system with a pump station and forcemain to the Schooner wastewater system was planned to be undertaken with the Infrastructure Replacement Program.

Upon the failed referendum for the Infrastructure Replacement Program, the Committee has asked for an options study to explore potential alternative systems for the Chart Drive Septic System that could produce an effluent suitable for grey-water reuse. Results are expected September 2015.

Infrastructure Replacement Program

The Infrastructure Replacement Program was proposed in September 2014 to the Committee based on the 2012 engineering study and asset management plan. Three options were presented to the Committee based on total program cost. All three options cost more than the service area has in Capital Reserves, borrowing is required to fund the project. An Open House was held November 22, 2014 for public consultation on the three options.

Based on the feedback received, the Committee chose to proceed with the CRD recommendation to have a referendum to borrow \$6,050,000 to fund the project. As a result the CRD proceeded to hold a referendum June 27, 2015 to borrow \$6,050,000 to fund the project. The referendum failed with the following results: 94 (43%) Yes and 126 (57%) No.

Additionally, the CRD applied for the New Building Canada Fund – Small Communities Fund grant to fund 2/3^{rds} of eligible funds. The CRD and Committee are awaiting results to determine how to proceed with addressing deficiencies outlined in the 2012 engineering study and asset management plan.

ANNUAL BUDGET AND FINANCIAL REPORT FOR 2014

Attached are copies of the *Statements of Operations (Unaudited)* for Magic Lake Estates Water and Sewer services as prepared by CRD Finance and Corporate Services for the year 2014. The statements provide an overview of the revenues and expenditures for the year.

Revenue includes parcel taxes (*Transfers from government*) and user fees (*Sale of services*), and small amounts for interest on savings and miscellaneous revenue such as connection charges and late payment charges (*Other revenue*). *Expenses* include all costs of providing the service. *General government services* include budget preparation, financial management, utility billing, and risk management services. *Other expenses* includes all other costs to administer and operate the water system, and the principal and interest payments on borrowing to finance capital projects. *Other fiscal services* includes administration costs for loans.

The difference between *revenue* and *expenses* is reported as *Net revenue (expenses)*. Any transfers to or from capital or reserve accounts for the service (*Transfers to own funds*) are deducted from this amount and it is then added to any surplus or deficit carry forward from the prior year, yielding an *Accumulated surplus* (or deficit) that is carried forward to the following year.

Magic Lake Water #1 and #2

Magic Lake Estates includes two water services. Magic Lake #1 is the primary service, which provides for the operation and maintenance of the water system and most of its capital improvements. Magic Lake #2 was established in 2000 to fund the debt servicing for a watermain replacement project in 2000 and 2001. The area boundaries for both services are the same, except that owners who elected to prepay their parcel tax for the watermain replacement project are excluded from the Magic Lake #2 service and are not assessed a parcel tax for the service. The financial statement includes both services.

Magic Lake Water – 2014 Statement of Operations

The MLE Water 2014 revenue of \$1,024,738 includes \$738,157 parcel tax and \$272,363 user fees. The total expenses of \$872,939 include \$19,879 for administration, \$849,832 for

operating expenses and \$3,228 *Other fiscal services*. The difference between revenue and expenses in 2014 amounted to a net revenue of \$151,799.

\$207,830 was transferred to reserve funds leaving a 2014 deficit of \$56,031 which, when deducted from the 2013 carry forward surplus of \$155,942 resulted in a residual surplus at the end of 2014 of \$99,911. This was carried forward to 2015.

As of December 31, 2014 the balance in the Magic Lake Water Reserve Fund was \$519,205 and the Capital Fund \$279,731 (WLA3633: \$113,477 & WSV185100: \$166,254).

The 2014 User Fee was \$250.00 and Parcel Taxes were \$695.72 (\$496.57 for Magic Lake #1 and \$199.15 for Magic Lake #2).

Magic Lake Sewer – 2014 Statement of Operations

The MLE Sewer 2014 revenue of \$456,116 includes \$281,366 parcel tax and \$168,912 user fees. The total expenses were \$422,334.

The difference between revenue and expenditures in 2014 resulted in an accumulated end-year surplus of \$33,782. The surplus was added to the 2013 carry forward of \$36,060 resulting in a year end surplus of \$69,842 which was carried forward to 2015.

As of December 31, 2014, the Magic Lake Sewer Reserve Fund contained \$178,372 and the Magic Lake Sewer Equipment Replacement Fund balance was \$76,003.

The 2014 User Fee was \$272.00 and Parcel Tax was \$414.76.

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