



TOWN OF LADYSMITH

A REGULAR MEETING OF THE
COUNCIL OF THE TOWN OF LADYSMITH
WILL BE HELD IN COUNCIL CHAMBERS AT CITY HALL ON
MONDAY, MARCH 21, 2016

Call to Order and Closed Meeting
5:00 p.m.
Regular Open Meeting
7:00 p.m.

A G E N D A

CALL TO ORDER (5:00 P.M.)

1. CLOSED SESSION

In accordance with section 90(1) of the *Community Charter*, this section of the meeting will be held *In Camera* to consider the following items:

- Municipal Service Provision (s. 90(1)(i))
- Human Resources Matter (s. 90(1)(c))
- Project and Organization Update (90(1)(m))

2. RISE AND REPORT

REGULAR MEETING (7:00 P.M.)

3. AGENDA APPROVAL

4. MINUTES

4.1. Minutes of the Regular Meeting of Council held Monday, March 7, 2016.....1 - 6

5. DELEGATIONS

5.1. Dr. Paul Hasselback, Medical Health Officer, Island Health7 - 17
Health at the Local Level: Report on Local Health Data

6. PROCLAMATIONS - None

7. DEVELOPMENT APPLICATIONS – None

8. BYLAWS (OFFICIAL COMMUNITY PLAN AND ZONING) – None

9. REPORTS

9.1. Water Quality Report for 2015 (presentation by the Director of Infrastructure Services) 18 - 78

Staff Recommendation:

That Council receive the 2015 Water Quality Report for the Town of Ladysmith.

Please note that the 2014 Water Quality Report is on the Town’s website at the following location www.ladysmith.ca/our-services/water/water-reports. A hard copy is available for viewing at City Hall.

9.2. Zoning Bylaw Housekeeping Amendments – Bylaw No. 1904 79 - 83

Staff Recommendation:

That, under the bylaws portion of the agenda, Council proceed with the first two readings of Town of Ladysmith Zoning Bylaw 2014, No. 1860, Amendment Bylaw (No. 4) 2016, No. 1904 and refer the bylaw to Public Hearing.

9.3. Additional Parking in the Vicinity of Aggie Hall 84 - 90

Staff Recommendation:

1. Direct staff to commence discussions with the owners of 125 Symonds Street to lease the property for parking, and to report back to Council on lease and funding options; and
2. Include in the 2016-2020 Financial Plan \$5,000 toward parking and traffic signage improvements in the Aggie Hall area, with funding to come from Gas Tax Funds.

9.4. Roof Emergency Repair – Frank Jameson Community Centre Swimming Pool..... 91 - 94

Staff Recommendation:

That Council

1. Direct staff to proceed with replacing the roof and wall system above the Oasis swimming pool at Frank Jameson Community Centre (FJCC);
2. Approve \$75,000 to be allocated to the replacement of the roof and wall system at FJCC and that the 2016-2020 Financial Plan be amended accordingly; and
3. Direct that, if the insurance claim is successful for the damage to the roof, the funding allocated above be returned to its original source.

9.5. Water Parcel Tax Rates for 2016 95 - 99

Staff Recommendation:

That Council direct staff to prepare the 2016 Water Parcel Tax rate bylaw at the rate of \$225.00 per parcel.

9.6. Fourth Avenue Road Improvement Project.....100 - 108

Staff Recommendation:

That Council:

1. Approve proceeding with the design phase of the 4th Ave/4th Ave Extension Upgrading Project for construction in late 2016, including the repaving of 4th Ave/4th Ave Extension;
2. Direct that the work start at Hambrook, and continue north;
3. Direct that the road cross section include the construction of a new 2 meter wide shared use bike lane/walkway on the west side, and new curbs on both sides;
4. Direct that construction include various underground utility replacements as outlined in Appendix “B”;
5. Waive the purchasing policy and contract with Herold Engineering Ltd. to provide the design work.

10. BYLAWS

10.1. Town of Ladysmith Waterworks Regulations Bylaw 1999, No. 1298, Amendment Bylaw 2015, No. 1902.....109 - 110
The purpose of Bylaw 1902 is to amend the Water Services Rates Bylaw 1999, No. 1298.

Staff Recommendation:

That Council adopt Bylaw No. 1902.

10.2. Town of Ladysmith Sanitary Sewer Rates Bylaw 1999, No. 1299, Amendment Bylaw 2016, No. 1903.....111 - 112
The purpose of Bylaw 1903 is to amend the Sanitary Sewer Rates Bylaw 1999, No. 1299.

Staff Recommendation:

That Council adopt Bylaw No. 1903.

10.3. Town of Ladysmith Zoning Bylaw 2014, No. 1860, Amendment Bylaw (No. 4) 2016, No. 1904113 - 121
The purpose of Bylaw 1904 is to incorporate housekeeping amendments into Zoning Bylaw 1860 as previously directed by Council. Bylaw 1904 is the subject of a staff report under Agenda Item 9.1.

Staff Recommendation:

That Council give first and second readings to Bylaw 1904, and refer it to a Public Hearing.

11. CORRESPONDENCE

- 11.1. Elizabeth Sheehan, President, Climate Smart 122
 Reminder to Sign Letter of Support for Tax and Leadership Incentives in the
 New Climate Leadership Plan

Staff Recommendation

That Council consider whether it wishes to sign on to a letter in support of a stronger tax and financial incentives as part of BC’s new Climate Leadership Plan consultation period.

12. NEW BUSINESS

13. UNFINISHED BUSINESS

13.1. Grants-in-Aid Deliberations

Council made the following recommendations for Grants-in-Aid to community organizations in 2016 at a Special Meeting of Council held March 14, 2016:

Organization	2016 Preliminary Approval
Arts Council of Ladysmith & District	1,500
Cowichan Family Caregivers Support Society	750
Cowichan Therapeutic Riding Association	0
Festival of Lights Society	13,500
Ladysmith & District Historical Society	
Archives	13,500
Museum	10,000
Preservation Committee	2,000
Ladysmith Ambassador Program	1,500
Ladysmith and District Marine Rescue Society	2,500
Ladysmith Celebrations Society	8,000
Ladysmith Citizens on Patrol	1,500
Ladysmith Community Gardens Society	1,500
Ladysmith Downtown Business Association	
Old Tyme Christmas	1,500
Shop Locally	1,500
Ladysmith Family and Friends (LaFF)	2,500
Ladysmith Fire Rescue	1,200
Ladysmith Little Theatre	500
Ladysmith Maritime Society	
Festival	1,500
Ladysmith Resources Centre Association	
Family Support	8,000

General Programs	8,000
Victim Services	12,000
Volunteer Counselling	1,500
Youth at Risk	8,000
Ladysmith Search & Rescue Society	5,000
Ladysmith Secondary School - Frank Jameson Bursary	1,500
Ladysmith Show & Shine	500
Old English Car Club Central Island Branch	250
St John the Evangelist Church	500
Stz'uminus First Nation Aboriginal Day	1,200
Vancouver Island Crisis Society	500
Waiving of Fees	2,500
TOTAL	114,400

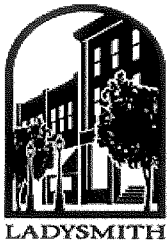
Staff Recommendation:

That Council confirm the Grants-in-Aid allocations for 2016.

14. QUESTION PERIOD

- A maximum of 15 minutes is allotted for questions.
- Persons wishing to address Council during “Question Period” must be Town of Ladysmith residents, non-resident property owners, or operators of a business.
- Individuals must state their name and address for identification purposes.
- Questions put forth must be on topics which are not normally dealt with by Town staff as a matter of routine.
- Questions must be brief and to the point.
- Questions shall be addressed through the Chair and answers given likewise. Debates with or by individual Council members or staff members are not allowed.
- No commitments shall be made by the Chair in replying to a question. Matters which may require action of the Council shall be referred to a future meeting of the Council.

ADJOURNMENT



TOWN OF LADYSMITH
MINUTES OF A REGULAR MEETING OF COUNCIL
MONDAY, MARCH 7, 2016
CALL TO ORDER 5:00 P.M. FOR CLOSED SESSION
CALL TO ORDER OF REGULAR OPEN MEETING 7:00 P.M.
COUNCIL CHAMBERS, CITY HALL

COUNCIL MEMBERS PRESENT:

Mayor Aaron Stone
Councillor Carol Henderson

Councillor Steve Arnett
Councillor Rob Hutchins

Councillor Cal Fradin
Councillor Duck Paterson

COUNCIL MEMBERS ABSENT:

Councillor Joe Friesenhan

STAFF PRESENT:

Ruth Malli
Erin Anderson

Sandy Bowden
John Manson

Felicity Adams
Joanna Winter

CALL TO ORDER

Mayor Stone called this Meeting of Council to order at 5:03 p.m. in order to retire immediately into Closed Session.

CLOSED MEETING

CS 2016-070

Moved and seconded:

That Council retire into Closed Session at 5:04 p.m. in order to consider the following items in accordance with section 90(1) of the *Community Charter*:

- the acquisition, disposition or expropriation of land or improvements

Motion carried.

RISE AND REPORT

Council rose from Closed Session at 6:52 p.m. without report.

REGULAR OPEN MEETING

Mayor Stone called the Regular Open Meeting to order at 7:00 p.m. and acknowledged the traditional territory of the Stz'uminus First Nation.

AGENDA APPROVAL

CS 2016-071

Moved and seconded:

That Council approve the agenda for the Council meeting of March 7, 2016 as amended by the following:

- Refer items 7.1 (Development Variance Permit Application, 410 Third Avenue) and 7.2 (Development Permit Application, 410 Third Avenue) to the next meeting at which all members of Council are present.
- Refer item 10.3 (Grants-in-Aid Discussion) to a Special Meeting of Council on Monday, March 14, 2016.
- Add item 6.1 – International Women's Day Proclamation

- Add item 13.4 – Movie Night

Motion carried.

MINUTES

CS 2016-072

Moved and seconded:

That Council approve the minutes of the Special Meeting of Council held January 26, 2016.

Motion carried.

CS 2016-073

Moved and seconded:

That Council approve the minutes of the Regular Meeting of Council held January 29, 2016.

Motion carried.

CS 2016-074

Moved and seconded:

That Council approve the minutes of the Regular Meeting of Council held February 15, 2016.

Motion carried.

PROCLAMATION

Mayor Stone proclaimed Tuesday, March 8, 2016 as International Women's Day in the Town of Ladysmith.

DEVELOPMENT APPLICATIONS

Official Community Plan Amendment/Rezoning Application – Holland Creek Development (Glencar Consultants)

Lot 1, Block 192, District Lot 103, Oyster District, Plan EPP44156

Glen Carey of Glencar Developments, project manager for the Holland Creek Development, responded to questions from Council and provided clarification on proposed plans for the section of the area known as Arbutus Hump.

CS 2016-075

Moved and seconded:

That Council direct staff to negotiate with the Holland Creek Development proponents a development boundary that respects the natural topography and protects a greater portion of the Arbutus Hump as park.

Motion carried.

COMMITTEE REPORTS

Mayor Stone reported that the Cowichan Valley Regional District Economic Development Function has been reactivated and recruitment for a new Economic Development Officer is underway. He also reported that the Cowichan Valley Transit Service partners will be seeking input in April from Ladysmith residents regarding transit service options, and that discussions will be initiated with the Regional District of Nanaimo to explore a commuter service between Ladysmith and Vancouver Island University with connections into Nanaimo.

Councillor Henderson reported that the Interagency Health Group has been reactivated and she is now involved in the discussions.

Councillor Paterson reported that the Annual General Meeting of the Festival of Lights is on March 17, 2016, and that plans are underway for 30th anniversary celebrations of the Festival of Lights in 2017.

Councillor Fradin reported that the Ladysmith Chamber of Commerce and Ladysmith Downtown Business Association are planning a Business Walk to identify issues and opportunities facing local businesses.

STAFF REPORTS

CS 2016-076

Canada 150 Community Celebrations Committee

Moved and seconded:

That Council:

1. Approve the Draft "Terms of Reference" for the Canada 150 Community Celebration Committee as presented;
2. Appoint Councillor Duck Paterson to sit on the Canada 150 Community Celebration Committee; and,
3. Direct staff to solicit community representation on the Canada 150 Community Celebration Committee per the "Terms of Reference".

Motion carried.

CS 2016-077

Moved and seconded:

That Council request that, at its inaugural meeting, the Canada 150 Community Celebration Committee invite representatives from North Oyster and Saltair to join the committee.

Motion carried.

CS 2016-078

Waterfront Area Plan Update

Moved and seconded:

That Council:

1. Support the scope of work for the Waterfront Area Plan Update and direct staff to proceed with development and issuance of the Request for Proposals.
2. Discuss the Waterfront Area Plan Update project at the March 29, 2016 Community to Community (C2C) workshop with Stz'uminus First Nation, with regard to the Provincial water lots and filled foreshore, particularly DL651 and Slack Point, and invite participation in the project and design charrette.
3. Direct staff to invite the property owners within the Waterfront Area Plan area to join a working committee as part of the project.
4. Direct staff to:
 - invite two nominations from each of the following advisory commissions and organizations: Ladysmith Maritime Society, Ladysmith Arts Council, Ladysmith and District Historical Society, Advisory Design Panel, Advisory Planning Commission, Heritage Revitalization Advisory Commission, Parks, Recreation and Culture Commission, Ladysmith Chamber of Commerce and Ladysmith Downtown Business Association, and
 - place an advertisement in the newspaper for two citizen members for consideration of appointment by Council to the

design charrette team for the Town-owned properties and water lots.

5. Appoint Mayor Stone and Councillors Friesenhan and Hutchins to the Waterfront Area Plan working committee and design charrette team.

Motion carried.

Draft Terms of Reference – Ladysmith Area Watersheds Roundtable

Moved and seconded:

CS 2016-079

That Council support in principle the draft “Terms of Reference” for the Ladysmith Area Watersheds Roundtable, and direct the City Manager to convey to the working group Council’s comments.

Motion carried.

Comments from Council members included: consultation with the Stz’uminus First Nation; a review of the Terms of Reference at the upcoming joint Town of Ladysmith and Stz’uminus First Nation meeting; developing a consensus communication protocol; referral of the Terms of Reference to a lawyer; inclusion of best practices and empirical evidence; holding meetings in other locations within the watershed; increasing the frequency of meetings; and, an annual review of the Terms of Reference.

BYLAWS

Town of Ladysmith Council Remuneration and Expense Bylaw 1999, No. 1298, Amendment Bylaw 2016, No. 1901

Moved and seconded:

CS 2016-080

That Town of Ladysmith Council Remuneration and Expense Bylaw 1999, No. 1298, Amendment Bylaw 2016, No. 1901 be adopted.

Motion carried.

Town of Ladysmith Waterworks Regulations Bylaw 1999, No. 1298, Amendment Bylaw 2016, No. 1902

Moved and seconded:

CS 2016-081

That Town of Ladysmith Waterworks Regulations Bylaw 1999, No. 1298, Amendment Bylaw 2016, No. 1902 be read a first, second and third time.

Motion carried.

Town of Ladysmith Sanitary Sewer Rates Bylaw 1999, No. 1299, Amendment Bylaw 2016, No. 1903

Moved and seconded:

CS 2016-082

That Town of Ladysmith Sanitary Sewer Rates Bylaw 1999, No. 1299, Amendment Bylaw 2016, No. 1903, be read a first, second and third time.

Motion carried.

CORRESPONDENCE

Ladysmith Community Gardens Society – Request to Install Electricity at Community Gardens

Moved and seconded:

CS 2016-083

That, in response to the correspondence from the Ladysmith Community Gardens Society dated February 15, 2016, Council direct staff to investigate opportunities for partnerships and alternative energy sources to provide power to the Ladysmith Community Gardens site.

Motion carried.

Ladysmith Resources Centre Association

Moved and seconded:

CS 2016-084

That, subject to confirmation by legal counsel, Council approve the request from the Ladysmith Resources Centre Association to withdraw \$75,000 from funds held in trust by the Town in accordance with the current lease agreement between the Town of Ladysmith and the Ladysmith Resources Centre Association for the premises at 630 Second Avenue.

Motion carried.

NEW BUSINESS

Revenues from Casinos

Moved and seconded:

CS 2016-085

That Council direct staff to draft a resolution for the Association of Vancouver Island and Coastal Communities or the Union of British Columbia Municipalities 2016 annual general meeting calling on the provincial government to expand the eligibility criteria for community gaming grants, to reinstate major capital projects gaming grants, and to permit neighbouring communities to access gaming revenues from communities in which casinos are located.

Motion carried.

Notice of Motion – Proposed Review of Communications and Information Technology Use Policies – Councillor Henderson

Moved and seconded:

CS 2016-086

That Council direct staff to review the Town's Communications Policy and Information Technology Use Policy for the purposes of ensuring both policies effectively define and address the need for respectful and appropriate communications with both internal and external customers, and incorporate best practices, and report back to Council in this regard.

Motion carried.

OPPOSED:

Councillor Arnett

Movie Night for Cops for Cancer

Council agreed to host a movie night in August 2016 as a fundraiser for Cops for Cancer Tour de Rock.

QUESTION PERIOD

Members of the audience enquired about rising and reporting of Closed Meeting resolutions, the Canada 150 Celebration Committee and movie night.

ADJOURNMENT

CS 2016-087

Moved and seconded:
That this meeting of Council adjourn at 9:09 p.m.
Motion carried.

CERTIFIED CORRECT:

Mayor (A. Stone)

Corporate Officer (S. Bowden)

Subject to Adoption

Medical Health Officer Report to Town of Ladysmith Council March 21, 2016

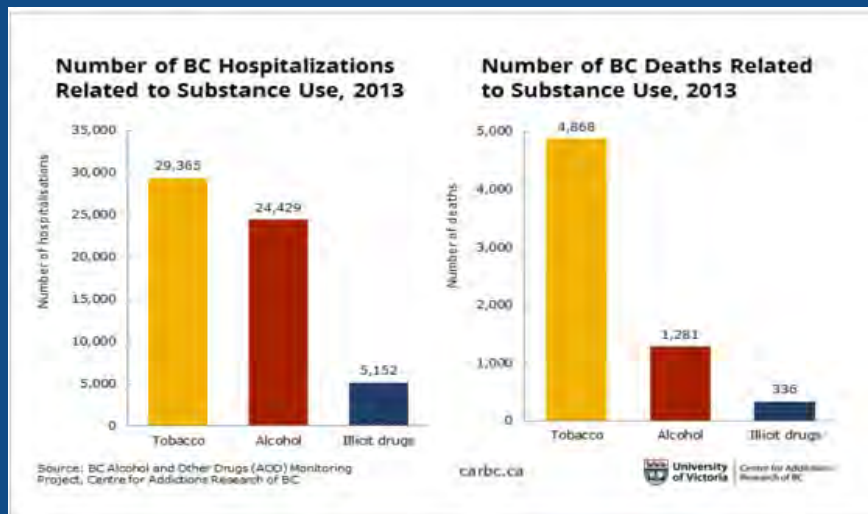
Substance Use and Misuse

*Excellent care for everyone,
everywhere, every time.*

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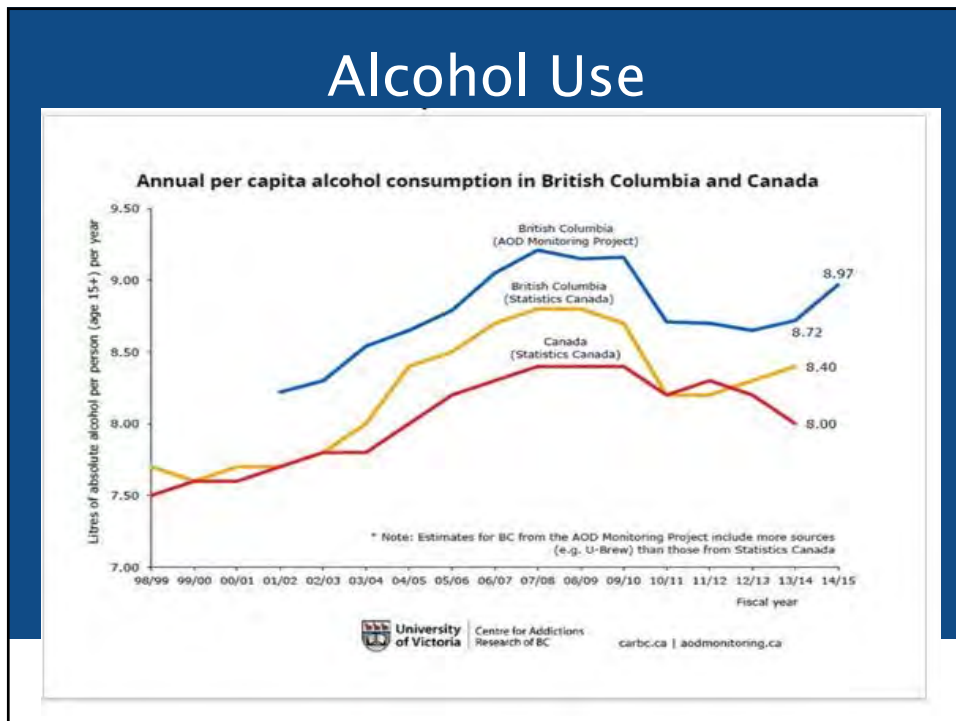
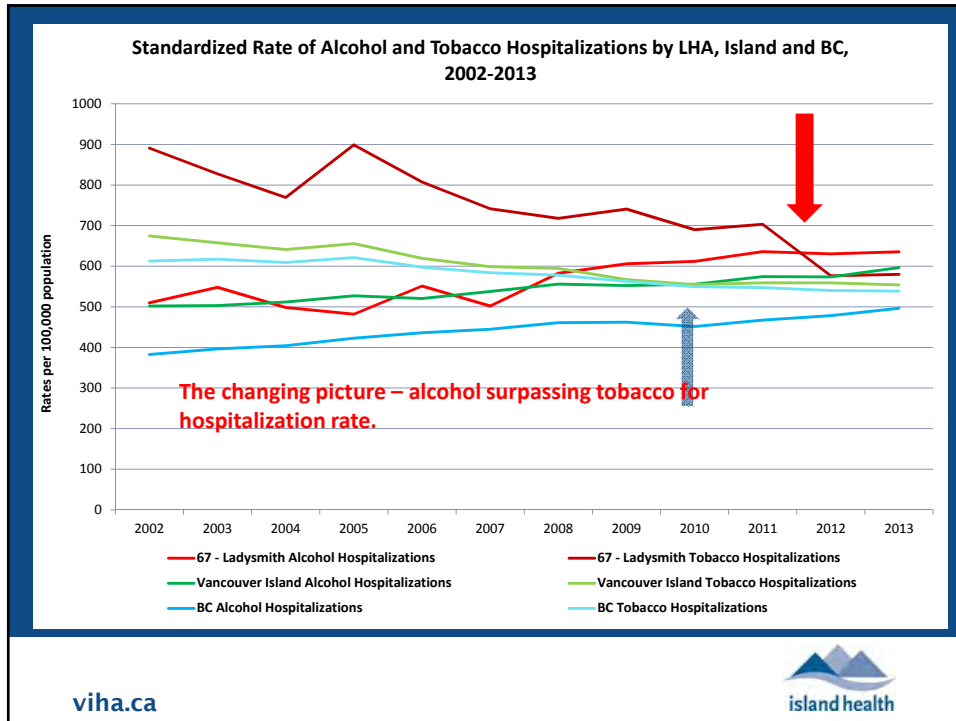
Substance use: Mortality and Morbidity

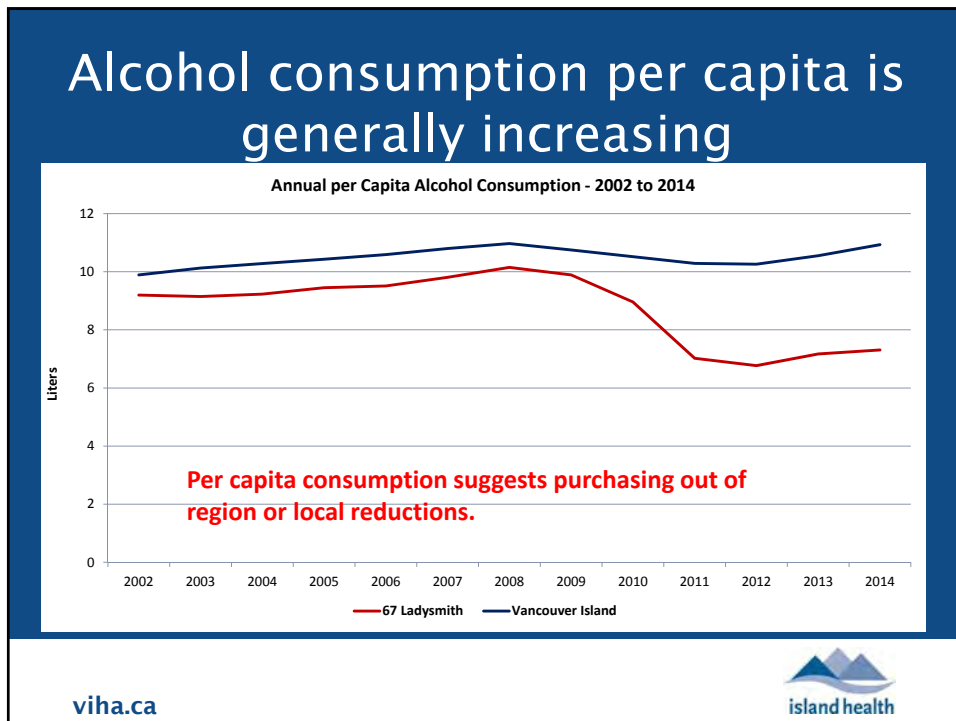
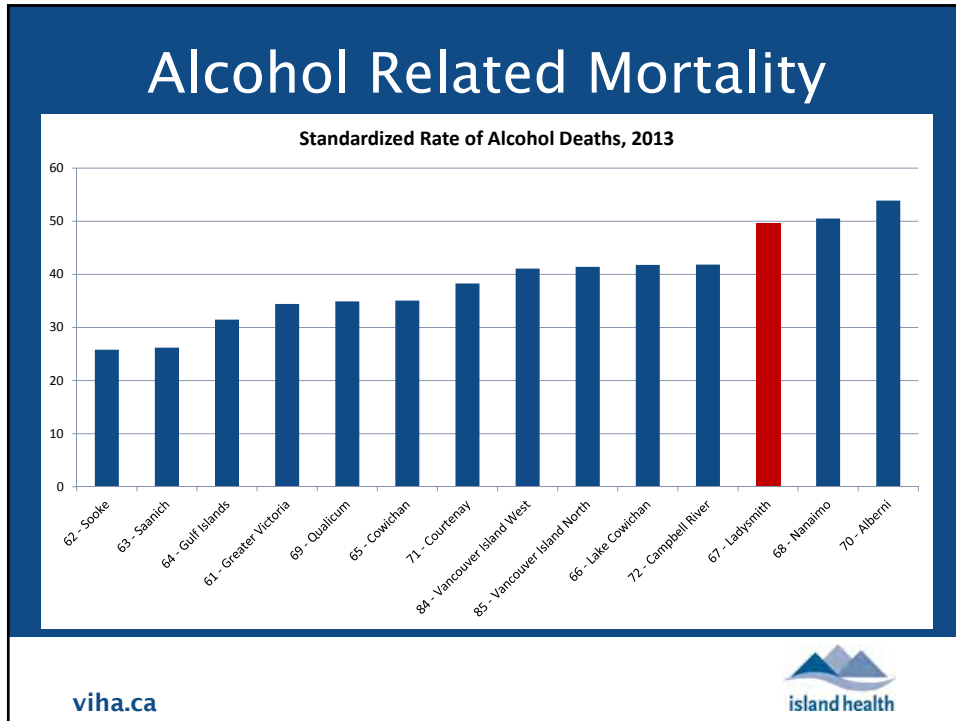


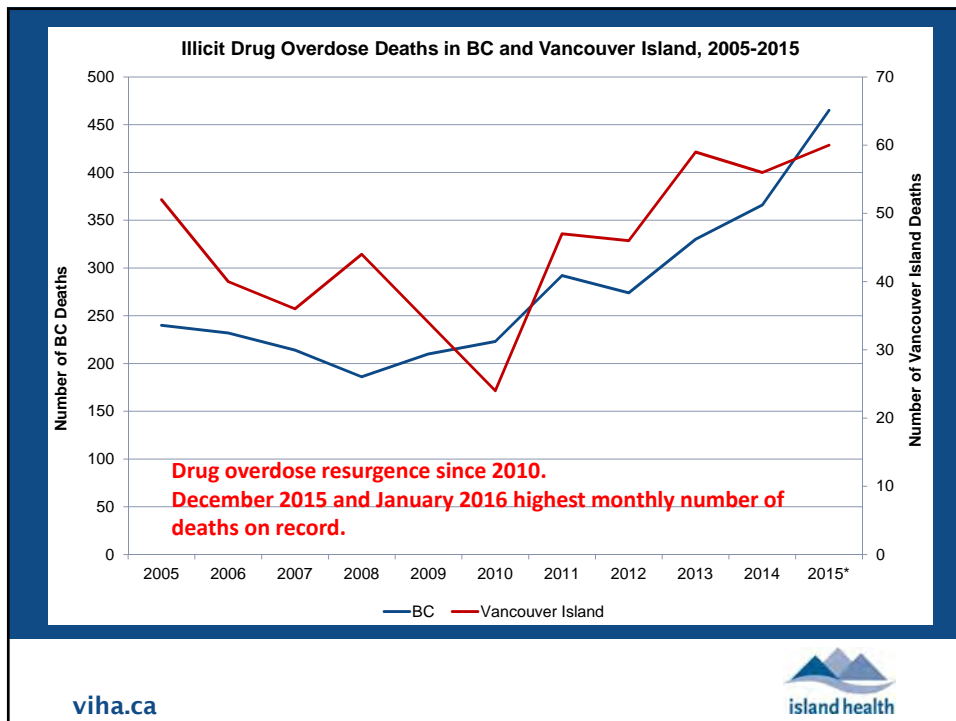
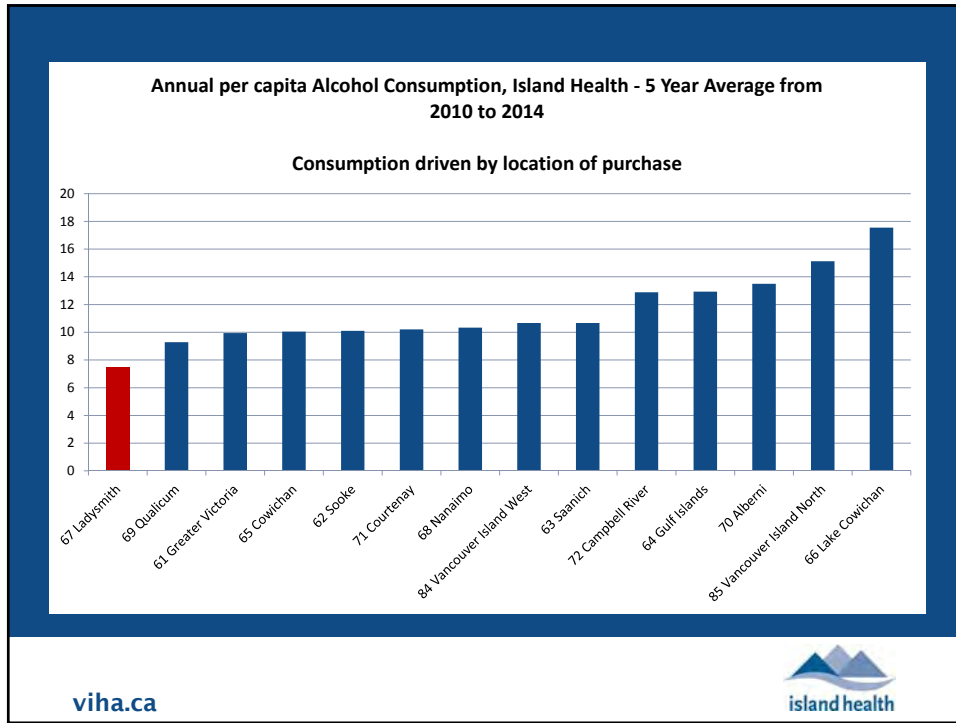
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Relatively, drugs receive more attention than more common substances.









The Changing Street Environment

- Fentanyl has become more available in last 3 years.
- Effect comparable to heroin - may be longer lasting.
- Most product 'imported' - not medical diversion.
- Higher concentration allows for smaller weights to be smuggled.
- Cheaper.
- Added issue: Poly pharmacy with many street supplies including narcotics and stimulants.

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Longer Term Needs

- Effective prevention of drug use and addiction.
 - School/university programming
- Early intervention activities
 - Access to peer support/counselling
- Major policy shifts.
 - Address negative impacts of underground economy
 - Access for users to test drug product
- Safer consumption sites.
- Increased access to detox and treatment programs. Treatment effectiveness low and best setting unclear
 - Current 12 detox beds for whole of Central Island 2-3 wk wait (Nanaimo)
 - 500 beds initiative
 - Rehab expensive
- Health professionals with more addiction training.
- Increased access to opiate substitution (methadone).

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Marijuana

- Not a special case.
- Special only in regulatory environment changing.
- Many issues that local governments may wish to consider.



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Issues

- Few proven health benefits, some health risks. Risk:benefit akin to alcohol.
- “Dispensaries” can be regulated to some extent by local government, but are not authorized by Health Canada – that may change. Product currently not monitored for quality.
- Authorized growers/dispensors need only advise local governments, but are not required to obtain approval.

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Housing as a Community Solution



- Good evidence of value
 - Local governments have significant influence
 - CVRD updated plan – next steps?
- Need for diverse options
 - Detox, transition housing, collective supported environments
- Zoning and NIMBY issues

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So What....

- Local governments can impact accessibility and can contribute to worsening or alleviating substance use issues.
- Local governments need to be aware of and involved in decisions related to marijuana – including setting policy direction.
- Substance use impacts have long been problematic, and require community wide solutions.

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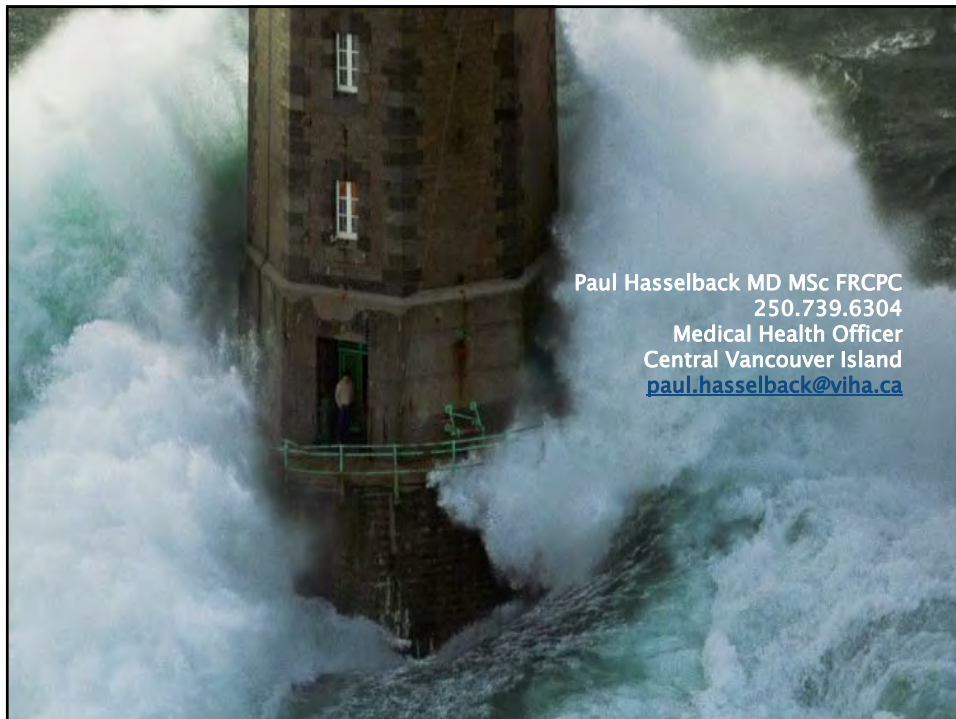


Advocacy Options

- Advocate for effective solutions
- Build hope
 - Treatment and detox options
 - Financial supports for clients
- Municipal Alcohol Policy
<http://bchealthycommunities.ca/map>



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Paul Hasselback MD MSc FRCPC
250.739.6304
Medical Health Officer
Central Vancouver Island
paul.hasselback@viha.ca

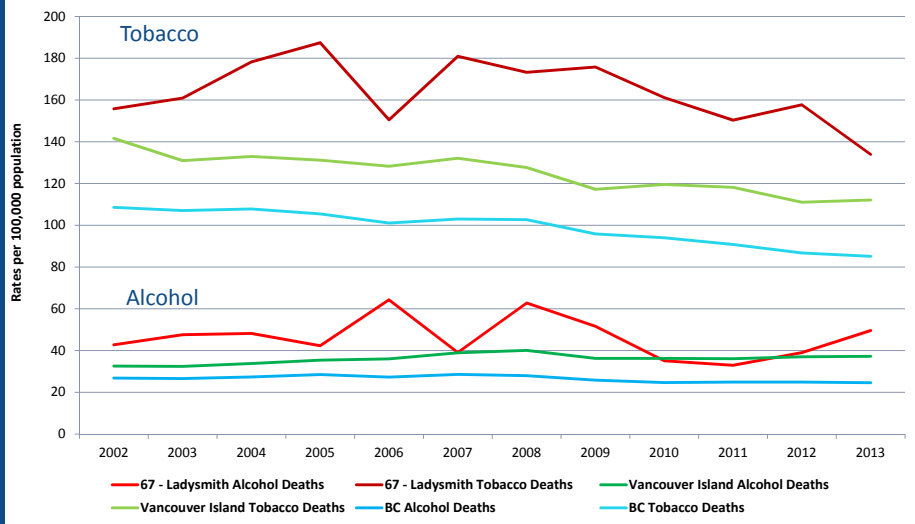
Outline

- Alcohol consumption – increasing.
- Illicit drugs – in midst of a tragedy.
- Marijuana – the Changing environment.
- Prescription drug use – on the horizon.
- Treatment options – limited.
- Role for local government.

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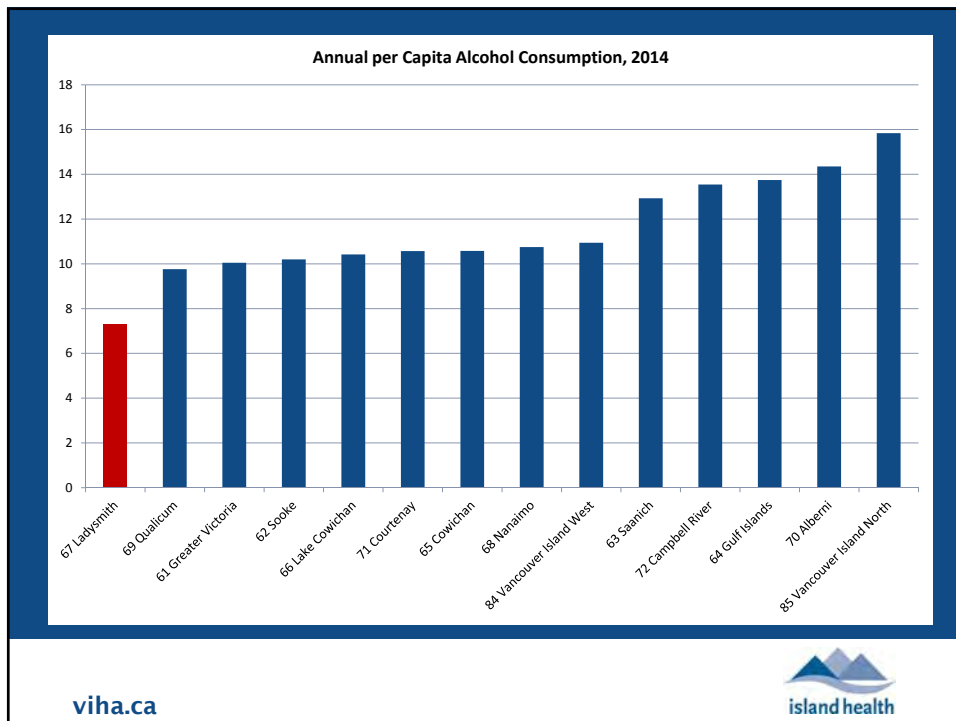
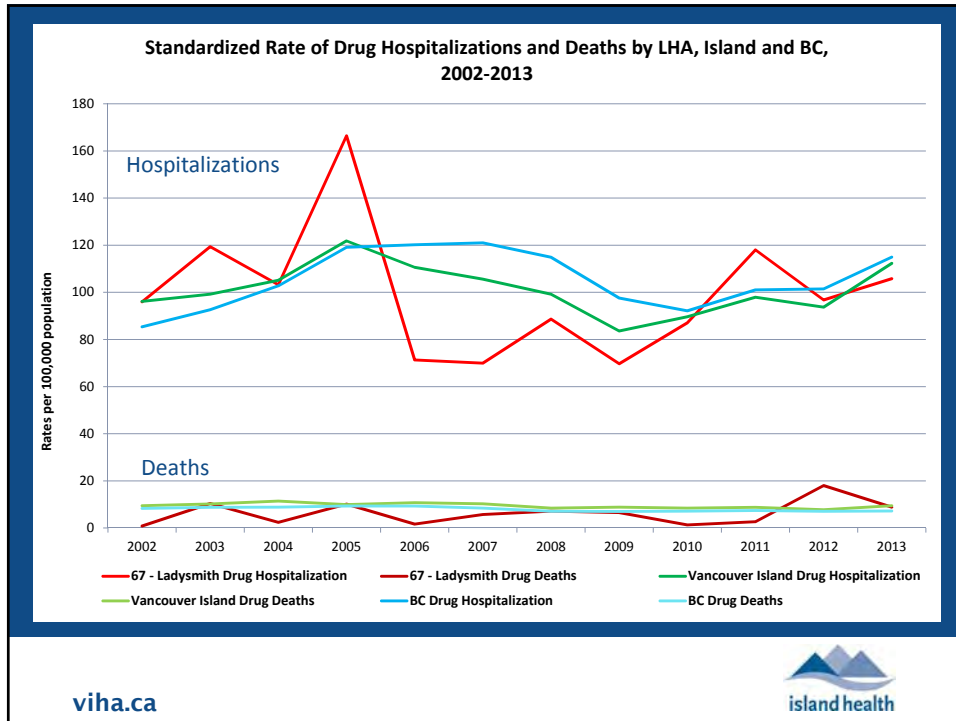


Standardized Rate of Alcohol and Tobacco Deaths by LHA, Island and BC, 2002-2013

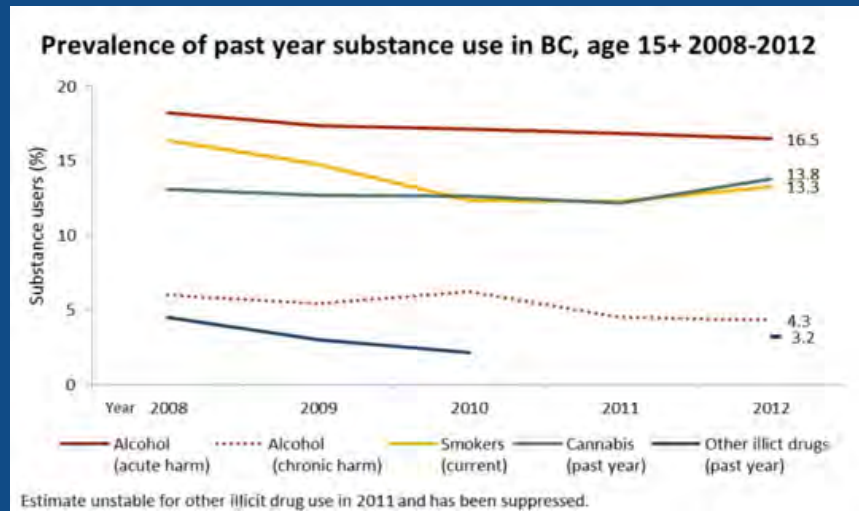


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Substance Use Trend



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Prescription Drug Overdoses

- Increasing.
 - Aging of persons with chronic pain.
 - Misuse
 - More controls in place



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2015

Annual Water Report



Prepared by:

Town of Ladysmith

Infrastructure Services

Department

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1. Introduction

The 2015 Annual Water Report provides an overview of the Town of Ladysmith water system (water sources, maintenance programs & capital improvements) and summarizes the annual water quality and production data. All water suppliers, under their Operating Permit, are required to provide an annual water report to the Vancouver Island Health Authority. This report is also posted on the municipal web site at www.ladysmith.ca.

2. Service Area & Sources

The Town of Ladysmith's water is drawn from two sources, which provide water through separate facilities at the mid/north and south ends of Town. The community is supplied in part by the Holland Lake and Holland Creek watershed which enters the water supply system at a diversion point at the Chicken Ladder Intake, a small stilling basin located approximately 2.5 km. from the Public Works yard, as well as from Stocking Lake, located south of the Town. Both of these supplies are now piped directly to the enclosed Arbutus Reservoir, where it is chlorinated and distributed by gravity to the entire Ladysmith service area and the Diamond Improvement District.

Holland Lake

The Holland Lake reservoir was constructed in 1979 at the location of two original lakes approximately 5 km west of the Town in a 'regulated access' watershed – it consists of two earth filled embankments, providing 1,600,000 cm of live storage. The reservoir currently discharges through a 450mm dia. steel pipe located 6.0 meters (19.7 feet) below the spillway elevation. There is a small remotely operated valve that controls discharge into Holland Creek, which augments base flows in Holland Creek, and enters the Town's water system at Chicken Ladder, located approximately 1 km west of the Arbutus reservoir. The dam is in good condition, and receives regular maintenance in accordance with current Provincial Dam Safety Standards. The dam is rated a high risk structure in accordance with the Provincial Dam Classification system. Annual dam inspections are carried out by staff, no issues were identified in 2015..

The Holland Lake reservoir is located predominately in active forestry lands owned by TimberWest Forest Corporation (TimberWest). The majority of lands contributing to the lower reaches of Holland Creek upstream of Chicken Ladder Intake is crown land managed forest. The Town owns the Holland Lake perimeter, while the lands contributory to the Lake is owned by TimberWest.

Logging Roads exist throughout the area, but are gated and signed to restrict public access to the Town's Lakes and Intakes. The public use the watershed for walking, and other related recreational activities, however, camping and water use at Holland and Stocking Lakes is restricted.

Chicken Ladder Intake (Holland Creek)

The Chicken Ladder Intake was constructed on Holland Creek in the 1960's, when the lower Holland Dam water intake that was originally constructed by the Ladysmith Water Company was relocated due to the need for higher operating pressures in the system. At that time, an earthen open reservoir was constructed adjacent to Holland Creek under the Power Lines, and a chlorination building was constructed at the same time. The earthen open reservoir was subsequently filled in and replaced with a 5,700 cm concrete covered reservoir in 2008, and the replacement of the chlorination building was completed in 2014, which is located on the site of

the old open reservoir. The Chicken Ladder Intake is located next to a well-used trail, and is considered to represent a moderately high risk for public access due to poor site security and constrained site access due to topography. The site is signed and marked restricting public access, but the remoteness of the location results in less than ideal site security.

Stocking Lake

Stocking Lake was built in the 1920's, by the Ladysmith Water Company, which was subsequently taken over by the Town. The Lake serves both the Town, as well as the Saltair area (Cowichan Valley Regional District). The Intake, which is shared by both water jurisdictions, is a 900mm dia. steel pipe located 5.0 meters (16.4 feet) below the spillway elevation. The dam is in 'fair' general condition, but has a documented seepage issue that dates back to the 1980's. The amount of seepage does not appear to change from year to year, however, discussions have commenced between the CVRD and the Town to repair the leak by adding additional embankment and enhance the stability of the structure. The dam is rated a low risk structure in accordance with the Provincial Dam Classification system.

The Stocking Lake area also is frequented by ATV users and occasional campers, as there is evidence of vandalism in the area. There is a trail system that travels the length of the Lake. The contributing areas of the watershed are owned by TimberWest, the Crown, the CVRD, and the Town.

Arbutus Reservoir

The Arbutus reservoir, 5,700 cu meters in capacity, currently provides daily peaking for the Town. As of the fall of 2012, both the North as well as the South portions of Ladysmith are served from the Arbutus Reservoir.

Figure one shows the general layout of the Watersheds and major storage and intake structures.

2.1. Ladysmith Water System - Distribution

The topography of the Town of Ladysmith slopes steeply towards the waterfront, resulting in a large range in the water pressures within the Town's water system. With the completion of the covered Arbutus Reservoir in 2008 and subsequent increase in distribution pressure (32psi), the Town introduced two specific pressure zones within the system with the installation of four pressure reducing stations. Future development above the 130meters geodetic will require the construction of additional reservoirs and pumping facilitates.

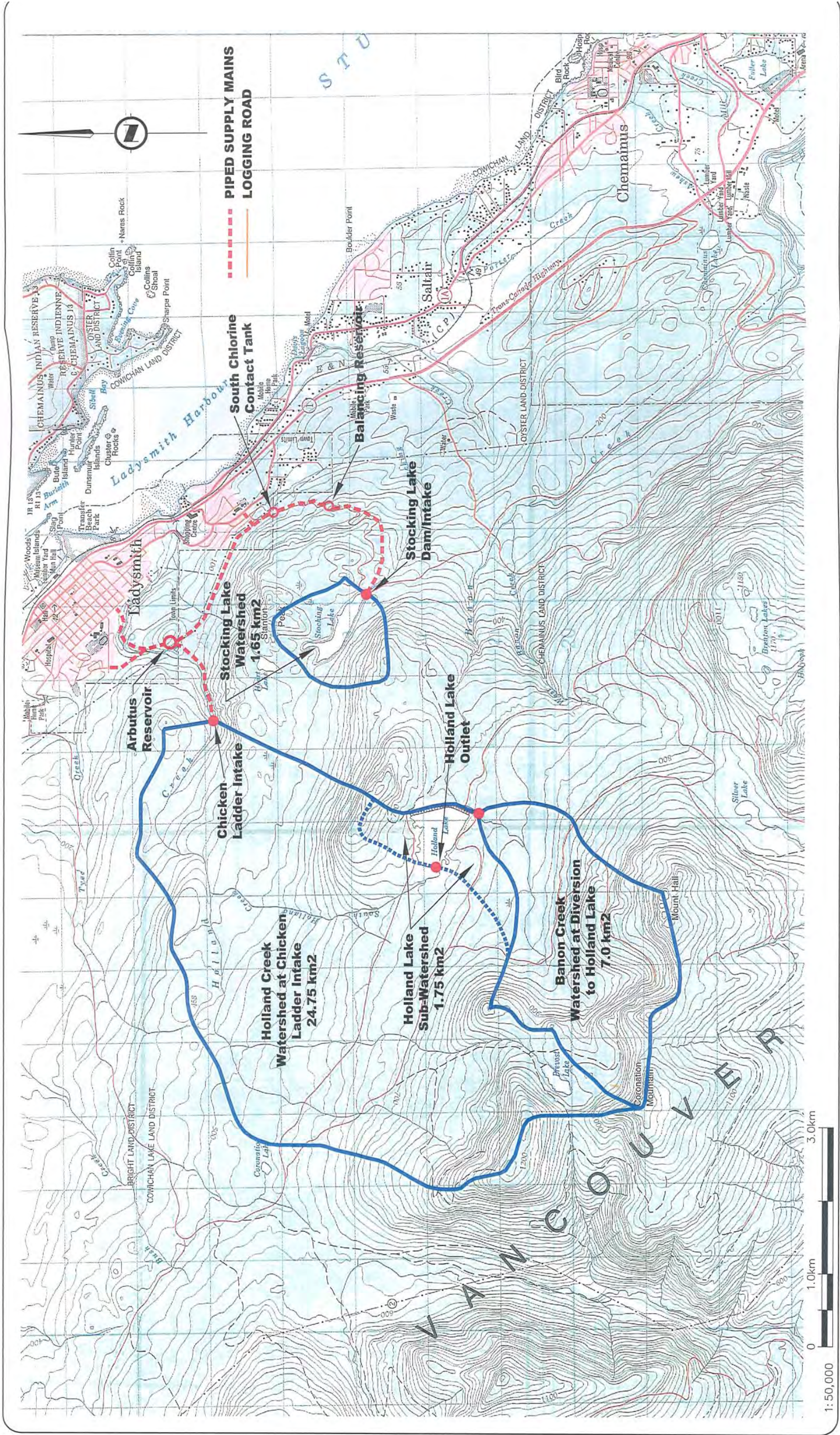
The distribution system for the Town consists of over 61 km of water main of varying sizes from 100mm to 250 mm. The mains are made of cast iron piping, asbestos cement piping or PVC piping. The cast iron and the asbestos cement piping (approximately 21 km) are located mainly in the older section of Town and within the area that was amalgamated from Saltair in 1985. The majority of the asbestos cement piping is 100 mm in diameter and needs to be replaced to allow for adequate flows throughout the system.

The Town has been actively working on a replacement program since 2000. Fire hydrants are situated throughout the distribution system at a spacing to offer adequate fire flows for all properties.

The Town has had access to computer modelling software for monitoring static and dynamic water pressures within the system.

The Town has recently replaced the existing gas chlorination system with a new gas system, with provision to possibly manufacture chlorine in the future. The project is part of a multi-phase project to improve water treatment for the Town. This is discussed later in the Report.

Figure 1 System Overview



3. Water Licensing

The Town currently holds the following water licenses:

Table 1 - Town Water Licences

License	Type	Annual Storage (cm, or Diversion (cm/yr)	Max Day Flow (Cu m)	Location	Date of Original Issuance	Comments
CL 017746	Diversion	995,000		Holland Creek (Chicken Ladder)	1946	Whole Year
CL 029821	Storage	123,348		Holland Creek (Chicken Ladder)	1962	Original earth reservoir (Now replaced with Arbutus Reservoir)
CL 125167	Diversion		3,640 cm/day	Banon Creek	1977	Replaces 112813 Diversion
CL 125167	Storage	1,820,000		Holland Lake	1977	Replaces 112813 Storage, updated to allow Holland to Stocking Pipeline
CL 112812	Storage	246,700		Holland Lake	1952	Replaces 21164
CL 005333	Diversion	Either: 829,000, or 454,000*		Stocking Lake	1902	Max 2,273 cm/day

**Under review by TOL staff*

Of relevance to the Town, the Cowichan Valley Regional District (CVRD) also holds water licenses on Stocking Lake as follows:

Table 2 - CVRD Water Licenses

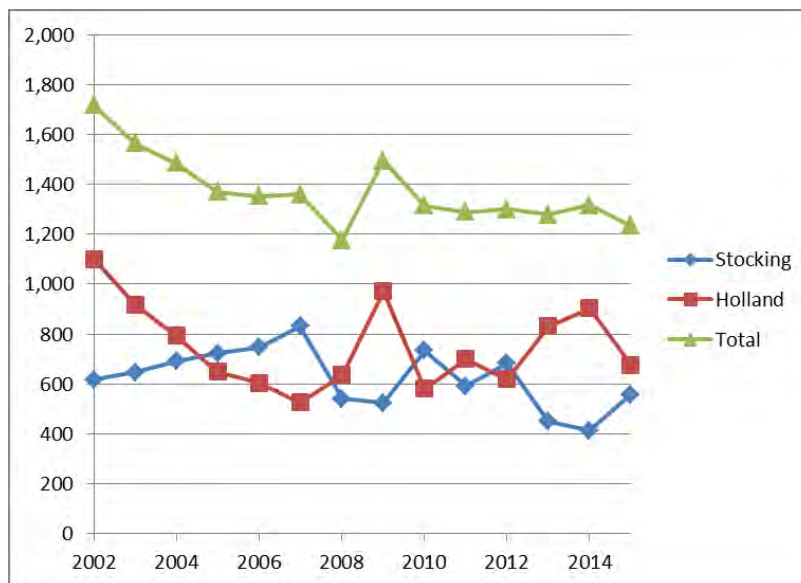
License	Type	Annual Storage (cm, or Diversion (cm/yr)	Max Day Flow (Cu m)	Location	Date of Original Issuance	Comments
CL 67482	Diversion	476,000		Stocking Lake	1984	All year, replaces 61318
CL 67481	Diversion	447,000		Stocking Lake	1955	All year, replaces 28487
CL 67484	Storage	542,000		Stocking Lake	1984	

4. Water Consumption

The Town used 1,234,000 cubic meters of water in 2015, a decrease of 6.0% over 2014, and considerably less than the consumption in 2002 (1.7M cu m). This reflects a trend that has been occurring at the Town since residential water metering was introduced in 2006. The Town is using approximately 25% less water now than 11 years ago (2002 annual consumption was 1,700,000 cu m). During the same period, the Town has grown over 23%, resulting in a net reduction of per capita water consumption in the order of 47%. The decrease is also a result of the 2015 water sprinkler restriction program, which saw summer flows reduced considerably over previous years.

A summary of water consumption by month, including the flow splits between Stocking Lake and Chicken Ladder Intake (Holland Creek) follows on the next page, and is illustrated as follows:

Figure 2
Ladysmith Total Consumption and Flow Source – 2002-2015
(In Thousands of cubic meters)



The general downward trend in water consumption is likely the result of the Town's decision to install residential water meters in 2006, as well as its progressive block pricing rate structure for single family residential water accounts. The Town has also been encouraging water conservation through programs such as a toilet rebate program, which would also have a downward impact on consumption.

Flow Split between Holland and Stocking Lakes

Over the last 10 years, the Town has used roughly equal amounts of water from Holland and Stocking watersheds. This has occurred primarily for two reasons: Firstly, until the fall of 2012, portions of South Ladysmith were not able to be fed of the Holland Watershed due to piping and chlorination equipment considerations. In 2012, a two way interconnecting pipe system was installed to connect the Stocking Lake supply line directly to the Arbutus Reservoir. Upon completion of this project, the old chlorination facility servicing South Ladysmith was taken out of service, and all chlorination is now taking place near the Arbutus Reservoir. This has had the effect of allowing an additional 100,000 cubic meters of Holland Creek water to be able to serve South Ladysmith during times when Holland Creek has acceptable turbidity levels.

Table 3 Town of Ladysmith Water Consumption, 2002-2015
(In thousands of cubic meters)

Year	Totals		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec							
	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland	Stocking	Holland				
2002	617,296	1,100,875	1,119,668	2,264	112,179	62,632	47,733	110,365	17,995	125,668	143,663	21,394	176,148	197,542	21,882	196,468	218,350	22,170	207,387	229,557	14,772	148,083	162,855	9,349	113,103	122,452	80,058	21,788	101,846	76,873	26,668	103,541
2003	647,416	917,405	1,00,662	7,247	108,227	84,301	10,682	101,806	10,848	121,234	132,082	19,948	185,552	205,500	22,979	193,965	216,944	14,703	155,289	169,992	8,381	103,237	111,618	54,219	46,953	101,172	48,870	52,404	101,274	100,958	2,309	103,267
2004	691,495	792,116	1,12,122	3,034	104,330	36,314	80,001	116,315	13,281	139,794	153,075	14,273	142,298	156,571	21,368	149,839	171,207	14,275	138,457	152,732	24,800	83,978	108,778	52,905	48,609	101,514	97,483	2,908	100,391	98,287	0	98,287
2005	721,864	648,749	1,12,512	0	100,595	89,583	7,981	97,564	45,736	76,963	122,699	11,427	116,536	127,963	15,125	134,275	149,400	20,243	152,390	172,633	16,166	117,875	134,041	45,123	42,729	87,852	74,729	0	74,729	92,064	0	92,064
2006	746,986	604,784	1,02,631	0	89,795	85,449	0	85,449	121,579	11,105	132,684	49,761	84,328	134,089	21,804	161,679	183,483	21,047	107,794	132,590	24,796	107,794	132,590	17,329	84,362	101,691	76,528	0	76,528	59,812	0	59,812
2007	832,033	526,018	1,08,909	2,457	102,444	98,558	3,665	102,223	66,489	60,609	127,098	21,794	125,909	147,703	27,653	140,573	168,226	25,391	60,630	86,021	17,062	101,539	118,601	86,800	10,537	97,337	72,907	18,868	91,775	106,430	913	107,343
2008	540,694	635,254	76,184	0	62,425	33,470	0	33,470	60,908	50,964	111,872	20,479	118,276	138,755	33,517	163,049	196,566	21,843	127,803	149,646	22,965	86,132	109,097	78,629	7,544	86,173	63,738	18,135	81,873	31,613	63,351	94,964
2009	524,043	970,807	52,486	43,323	41,905	38,626	80,462	119,088	29,813	133,864	163,677	35,621	160,221	195,842	31,068	158,057	189,125	25,602	82,249	106,683	24,434	82,249	106,683	61,179	35,006	96,185	99,150	2,462	101,612	54,397	45,297	99,694
2010	733,566	580,294	94,215	530	53,712	57,555	28,567	86,122	54,036	47,938	101,974	37,272	74,372	111,644	26,349	144,144	170,493	23,241	126,648	149,889	42,940	65,322	108,262	85,101	8,465	93,566	94,679	3,077	97,756	97,783	1,172	108,955
2011	591,114	688,476	98,832	0	77,705	52,997	36,900	89,897	66,702	30,816	97,518	15,036	115,018	130,054	18,591	134,989	153,580	20,409	139,897	160,306	28,537	89,158	117,695	77,843	12,664	90,507	48,756	35,708	84,464	36,452	50,951	87,403
2012	681,701	618,568	73,561	14,887	90,632	85,575	0	85,575	31,734	79,788	111,522	13,780	103,435	117,215	20,065	137,006	157,071	22,632	141,874	164,506	19,063	105,250	124,313	64,611	35,990	100,601	88,055	0	88,055	92,107	0	92,107
2013	448,751	830,005	89,759	0	92,544	46,305	38,418	84,723	15,166	92,829	107,995	23,506	94,528	118,034	1,922	168,656	170,578	1,333	148,963	150,296	11,610	94,429	106,039	20,307	70,124	90,431	52,620	30,010	82,630	7,444	89,067	96,511
2014	413,948	903,369	31,772	68,018	80,922	17,730	64,829	82,559	36,107,338	107,374	2,641	141,993	144,634	5,304	165,286	170,590	737	144,087	144,824	1318	112,709	114,027	62,218	27,180	89,398	66,068	22,852	88,920	92,710	0	92,710	
2015	557,206	677,497	85,337	0	92,064	50,412	40,469	90,881	1,389	120,072	121,461	2,902	149,273	152,175	386	122,336	122,722	45	108,183	108,228	28	91,130	91,158	64,465	27,077	91,542	70,594	17,885	88,479	97,879	1,072	98,951

5. Drinking Water Regulations

In Canada, drinking water is regulated by the Provincial and Local Governments. While the Federal Government, Health Canada, performs research and publishes recommendations for safe drinking water, each Province has the responsibility to regulate drinking water (in British Columbia [BC], the Ministry of Health has this responsibility). Locally, each water supplier also complies with the local Health Authority requirements (The Town of Ladysmith is under the jurisdiction of Island Health [VIHA]).

This section presents the Federal recommendations, as well as the BC regulations and requirements from the VIHA.

5.1. Canadian Drinking Water Quality Guidelines

The Guidelines for Canadian Drinking Water Quality are established by the Federal-Provincial-Territorial Committee on Drinking Water and are published by Health Canada (Ref. 8). They are regularly revised, based on the latest research results. The Guidelines are intended to be used as benchmarks for the Provinces.

The Guidelines consider more than 100 parameters that can, potentially, be found in Canadian drinking water sources: bacteriological pathogens; physical and chemical contaminants, including metals, inorganics, pesticides, and other organics; as well as radionuclides. The Guidelines establish two types of limits for these contaminants. The Maximum Acceptable Concentration (MAC) is based on health considerations, while the Aesthetic Objective (AO) is based on aesthetic considerations.

Appendix A provides the latest revision (June 2012) of the Canadian Drinking Water Guidelines.

5.2. BC Regulations

In BC, drinking water is regulated by the British Columbia Drinking Water Protection Regulation (2003) and the Drinking Water Protection Act (2001) (Refs. 1 and 2, respectively).

The BC Ministry of Health is primarily concerned with bacteria. *Escherichia coli* and fecal coliforms must not be detected. Total coliforms must not be detected 90 percent of the time, and if detected, they must be less than 10 counts per 100 mL.

The regulations also provide monitoring frequency requirements. They vary with the number of served population. For a water supply system that serves between 5,000 and 90,000 people, it is required that 1 sample per 1,000 people be collected per month. For Ladysmith, which currently serves 8,000 people, 8 samples per month are required. Moreover, the bacteriological analyses must be performed by a laboratory which has been approved by the BC Ministry of Health.

Other requirements include reporting. The water supplier must make public an annual report showing the results of the monitoring. Also, if the standards are not met, the laboratory must immediately inform the health officer and the water supplier. The water supplier must then give a public notice of non-potable water.

The regulations also require certification for water systems operators. This will be discussed in section 8.0 of the report.

5.3. Island Health Authority Requirements

The Town must also comply with the local Health Authority requirements. VIHA officers evaluate and assess new sources of water for public use, make recommendations for operating permits, review water quality monitoring data, and inspect water systems.

VIHA has issued two policies regarding drinking water quality. The *Guidelines for the Approval of Water Supply Systems* was issued in 2006 and provides treatment requirements and recommendations on water quality testing before the approval of any new water supply system.

The *Drinking Water Treatment for Surface Water Supplies Policy*, or *4-3-2-1 Policy*, was issued at the end of 2007 and refers to treatment requirements for water systems supplied by surface water. Both are discussed below.

Guidelines for the Approval of Water Supply Systems

VIHA *Guidelines for the Approval of Water Supply Systems* require that before the submission for approval of new water supply system, raw water be characterized for the following parameters:

- Microbiological pathogens: total coliforms, non-coliform bacteria, Escherichia coli, heterotrophic plate count
- Physical parameters: colour, conductivity, pH, turbidity
- Chemical parameters: alkalinity, corrosiveness, hardness, organic nitrogen, total dissolved solids (TDS), total organic carbon (TOC), ammonia, chloride, fluoride, nitrate,
- nitrite, sulphate, arsenic, selenium, and other metals
- The guidelines also require treatment providing the following levels:
- 3 log inactivation or reduction for Cryptosporidium and 3 log inactivation or reduction for Giardia
- 4 log inactivation or reduction for viruses and bacteria
- Minimum CT factor of 12 min.mg/L and chlorine residual of 0.2 mg/L
- Disinfection by-products (trihalomethanes [THMs], haloacetic acids [HAAs], chlorite and bromate) at acceptable levels
- Acceptable colour, odour, and taste

Drinking Water Treatment for Surface Water Supplies Policy

More recently, VIHA issued the *Drinking Water Treatment for Surface Water Supplies Policy* which has stricter requirements on treatment for water systems supplied by surface water. Treatment goals for surface water systems are the following:

- 4 log inactivation or removal of viruses;
- 3 log inactivation or removal of *Cryptosporidium* and *Giardia*;
- 2 treatment processes (usually filtration and disinfection);
- 1 ntu turbidity maximum in the finished water;
- Filtration deferral may be permitted under the following conditions:
 - Turbidity be less than 1 ntu 95 percent of the time, and peak turbidity readings be less than 5 ntu for no more than 2 days in a 1-year period;
 - No more than 10 percent of raw water samples exceed 20 *Escherichia coli*/100 mL in any 6-month period;
 - Two primary disinfectants be used; the two together need to achieve the 4 log inactivation or reduction of viruses and 3 log inactivation or reduction of *Cryptosporidium* and *Giardia*;
 - Effective ongoing watershed protection;

As well, the VIHA may require additional treatment to address the following:

- High bacterial counts or risks of fecal contamination of source water;
- High organic matter that may result in unacceptable levels of disinfection by-products;
- Chemicals or other contaminants that may affect potability.

In 2009, The Town retained Koers and Associates to produce a Drinking Water System Assessment report which identified specific actions that the Town were to take to manage a number of potential risks associated with our water system. These risks included:

- Physical Priority Improvements;
- Water Quality Monitoring;
- Longer term Actions.

These actions have been the focus of efforts by the Town to meet the 4-3-2-1 water quality objectives laid out by VIHA since 2009. However, recent water quality test results, particularly related to turbidity at Holland Lake and recent e-coli raw water sampling may result in the Town having to amend the original recommend approach of filtration deferral through selective use of alternate supply sources, which has been the Town's practice until the present time. This will be discussed further in the next sections.

6. Water Quality Monitoring Program

The Town monitors and records water quality parameters in general compliance with the requirements of our Operational Permit issued by VIHA. In 2009, Koers and Associates issued a Water Quality Monitoring Program Report (Ref 4) that guides the collection of a number of water quality parameters for the Town, summarized as follows:

Table 4 Water Testing Frequencies

Parameter	Frequency by Location			
	Holland Lake	Chicken Ladder Intake (Holland Creek)	Balancing Reservoir (Stocking Lake)	Distribution System
Physical Parameters				
Turbidity	Weekly or Continuous*	Weekly or Continuous*	Weekly or Continuous*	-
Total Organic Carbon (TOC)	Monthly	Monthly	Monthly	-
Dissolved Organic carbon (DOC)	Monthly	Monthly	Monthly	-
True Color	Weekly	Weekly	Weekly	-
Apparent Color	Weekly	Weekly	Weekly	-
Temperature	Weekly	Weekly	Weekly	Along with regular health Sampling
Ultraviolet Transmissivity (UVT)	Semi-Monthly	Semi-Monthly	Semi-Monthly	-
Total Dissolved Solids (TDS)	Monthly	Monthly	Monthly	Monthly
Chemical Parameters				
Alkalinity	Monthly	Monthly	Monthly	Monthly
Physical Parameters	Monthly	Monthly	Monthly	Monthly
Calcium	Monthly	Monthly	Monthly	Monthly
Bromide	Monthly	Monthly	Monthly	-
Hardness	Semi-Annually	Semi-Annually	Semi-Annually	-
Total Metals	Semi-Annually	Semi-Annually	Semi-Annually	Semi-Annually
Microbiological Parameters				
E Coli	Semi-Annually	Semi-Annually	Semi-Annually	Semi-Annually
Total Coliforms	Semi-Annually	Semi-Annually	Semi-Annually	Semi-Annually
Regular Health Sampling	-	-	-	?
Miscellaneous Parameters				
Total Extractable Hydrocarbons (T.E.H.)	-	Following high turbidity events	-	-
THM Formation	Quarterly, or following high color events	Quarterly, or following high color events	Quarterly, or following high color events	Bi-Monthly
Chlorine Residual	-	-	-	Along with regular health Sampling
* Actual Turbidity Frequency	Continuous	Daily	Continuous	Continuous

The results of the annual lab tests (excluding turbidity and health Bacteriological testing) for Holland Lake, Stocking Lake, and Chicken Ladder Intake are detailed in Appendix B.

6.1. Physical Parameters

a) Turbidity

The Town receives its source water from either Chicken Ladder Intake (on Holland Creek upstream of the Arbutus reservoir), or Stocking Lake. The Chicken Ladder Intake includes water being released from Holland Lake, as well as additional catchment water collected downstream from Holland Dam through the Holland Creek watershed. The Town has the ability to ‘switch’ water supplies rapidly in response to turbidity events in either sources of supply, and hence has the ability to influence the water quality of water being delivered to the system, subject to total annual flow and time of year limitations set out by our respective water licenses. The table below provides the blended turbidity values for water that is used for the Ladysmith system. Details on the flow splits between Stocking and Chicken Ladder (Holland Creek) can be found in Section 4:

Table 5 Blended Water (Either Stocking Lake, or Chicken Ladder)

Month	Ave	High	Low	Days > 1 NTU	Days > 5 NTU	% Stocking Water	% Holland Water
January	0.332	0.781	0.000	0	0	31.8%	68.2%
February	0.324	0.660	0.000	0	0	60.0%	40.0%
March	0.344	0.580	0.000	0	0	85.2%	14.8%
April	0.362	0.600	0.230	0	0	21.5%	78.5%
May	0.329	0.470	0.260	0	0	0.0%	100.0%
June	0.485	0.840	0.330	0	0	1.8%	98.2%
July	0.480	0.640	0.370	0	0	3.1%	96.9%
August	0.411	0.640	0.136	0	0	0.5%	99.5%
Sept	0.174	0.320	0.140	0	0	1.2%	98.8%
October	0.422	0.820	0.080	0	0	69.6%	30.4%
November	0.328	0.500	0.000	0	0	74.3%	25.7%
December	0.470	0.720	0.420	0	0	100.0%	0.0%
Summary	0.372	0.840	0.000	0	0	31.4%	68.6%

0.0% 0.0%

Our blended water easily meets the VIHA Guidelines for Surface Water Supplies for turbidity in 2015.

In addition to measuring turbidity in our ‘managed’ water supply, the Town also collects turbidity data for all of our sources of supply, irrespective of whether the supply is being utilized at the moment. This includes the continuously monitored turbidity meter at Holland Lake and Stocking Lake, as well as ‘manual’ field turbidity samples that are taken weekly by staff at both Stocking Lake, as well as our Chicken Ladder (Holland Creek) Intake.

Holland Lake

The results of our third full year of continuous Holland Lake turbidity monitoring are as follows:

Table 6 Holland Lake Turbidity Summary (NTU)

Month	Complete	Ave	High	Low	Days > 1 NTU	Days > 5 NTU
January	Yes	0.887	1.042	0.683	5	0
February	Yes	0.677	2.144	0.431	1	0
March	Yes	0.738	5.352	0.367	5	0
April	Yes	1.343	8.226	0.476	8	1
May	Yes	0.676	1.037	0.334	0	0
June	Yes	0.972	1.507	0.745	10	0
July	Yes	0.519	1.496	0.208	2	0
August	Yes	0.357	1.425	0.189	0	0
Sept	Yes	0.169	0.870	0.434	0	0
oct	Yes	1.045	1.714	0.413	15	0
Nov	Yes	1.377	1.675	1.209	30	0
Dec	Yes	1.129	1.681	0.694	20	0
Summary		0.824	8.226	0.189	96	1
					26.3%	0.3%

In order for the Town to successfully argue for a filtration deferral under VIHA guidelines, Holland Lake turbidity must not exceed 1 NTU more than 5% of the year (all but 18 days), and must not exceed 5 NTU 99.5% of the year (all but 2 days). Holland Lake turbidity exceeded 5 NTU 1 day in 2015, and also exceeded 1 NTU a total of 96 days in 2015, exceeding the maximum limit of 18 days by a factor of about 5.

We now have three years of continuous turbidity data for Holland Lake, of which all three years failed to meet the current turbidity criteria for filtration deferral.

The results shown above represent automatic turbidity recordings, however, staff also recorded manual samples on an approximately bi-weekly basis during 2015, which generally correspond to the turbidity recorder readings noted above.

Stocking Lake Turbidity

Stocking Lake generally produces water under 1.0 NTU during the entire year. The Town installed a continuous turbidity meter on the Stocking Lake system a number of years ago. With the exception of three isolated turbidity sample days which was the result of a meter recoding error due to maintenance procedures, not related to the actual water quality, the turbidity results for 2015 are under 1.0 NTU for all of the year.

Table 7 Stocking Lake Continuous Turbidity Results

Month	Ave	High	Low	Days > 1 NTU	Days > 5 NTU
January	0.421	0.667	0.274	0	0
February	0.388	0.831	0.251	0	0
March	0.438	0.720	0.243	0	0
April	0.346	0.498	0.200	0	0
May	0.382	0.849	0.219	0	0
June	0.343	0.999	0.183	0	0
July	0.184	0.534	0.127	0	0
August	0.191	0.385	0.118	0	0
September	0.184	0.572	0.106	0	0
October	0.396	0.717	0.145	0	0
November	0.407	0.630	0.231	0	0
December	0.380	0.556	0.248	0	0
Summary	0.338	0.999	0.106	0	0

0.0% 0.0%

Chicken Ladder Intake (Lower Holland Creek)

Staff visit Chicken Ladder Intake on a daily basis, and collects a turbidity sample during that inspection. The sampling for 2015 includes a total of 376 readings and samples tested, and are summarized below:

Table 8 Holland Creek (at Chicken Ladder) Measured Turbidity Results

Month	Ave	High	Low	Days > 1 NTU	Days > 5 NTU
January	0.358	0.93	0.17		
February	0.602	2.75	0.18	4	
March	0.670	1.55	0.33	4	
April	0.447	0.58	0.28		
May	0.419	0.68	0.25		
June	0.673	1.00	0.43		
July	0.321	0.62	0.15		
August	0.234	0.34	0.15		
September	0.294	0.58	0.19		
October	0.464	0.88	0.21		
November	0.987	5.98	0.22	6	1
December	1.923	12.00	0.43	10	2
Summary	0.616	12.0	0.15	24	3

6.6% 0.8%

Staff monitor turbidity levels at Chicken Ladder on a regular basis, and are able to ‘switch’ water supplies rapidly when turbidity events occur (usually the result of high intensity rain storms occurring in the upper Holland watershed). As a result, none of the high turbidity water from Chicken Ladder ended up in the water system in 2015.

The above results confirm that Chicken Ladder, similar to Holland Lake, will not meet the “raw water” criteria for filtration deferral as both the 1NTU and 5NTU limits were exceeded in 2015.

b) Organic Carbon, Color, Temperature, Ultraviolet Transmissivity, Dissolved Solids

Results for Holland Lake, Stocking Lake, and Chicken Ladder are attached in Appendix B, and summarized as flows:

Table 9 Holland Lake – Other Physical Results

Parameter	No of Samples	Units	Ave	High	Low	CDW Guideline	Comments
Total Dissolved Solids	21	Mg/L	20.17	57	<10	<500	OK
PH	14	PH Units	6.7	6.95	6.2	6.5-8.4	OK
True Color	46	Col Unit	22.63	45.8	5.0	<15 (AO)	High
Apparent Color	46	Col Unit	22.17	60.0	5.0		
Dissolved organic Carbon	14	Mg/L	2.83	3.51	2.24	<5 (AO)	OK
Total Organic Carbon	14	Mg/L	3.23	4.27	2.08	n/a	
Ultraviolet Transmissivity	24	AU/cm	77.46	96.9	66.3	>80 (AO)	OK – review for UV Disinfection

(AO) Aesthetic Objective

Table 10 Holland Creek (Chicken Ladder) – Other Physical Results

Parameter	No of Samples	Units	Ave	High	Low	CDW Guideline	Comments
Total Dissolved Solids	22	Mg/L	20.06	44.0	<10.0	<500	OK
PH	15	PH Units	6.91	7.15	6.4	6.5-8.4	OK
True Color	47	Col Unit	19.54	44.7	7.0	<15 (AO)	High
Apparent Color	47	Col Unit	14.49	56.9	5.0		
Dissolved organic Carbon	14	Mg/L	2.41	3.55	1.51	<5 (AO)	OK
Total Organic Carbon	14	Mg/L	2.93	4.52	0.69	n/a	
Ultraviolet Transmissivity	24	AU/cm	80.2	88.2	60.5	>80 (AO)	High

(AO) Aesthetic Objective

Table 11 Stocking Lake – Other Physical Results

Parameter	No of Samples	Units	Ave	High	Low	CDW Guideline	Comments
Total Dissolved Solids	22	Mg/L	22.94	33.0	<10	<500	OK
PH	14	PH Units	7.17	7.41	6.8	6.5-8.4	OK
True Color	46	Col Unit	14.3	27.9	6.0	<15 (AO)	OK
Apparent Color	46	Col Unit	11.43	30.0	5.0		
Dissolved organic Carbon	14	Mg/L	2.54	3.2	1.97	<5 (AO)	OK
Total Organic Carbon	13	Mg/L	2.73	4.61	1.21	n/a	
Ultraviolet Transmissivity	24	AU/cm	82.47	85.7	77.3	>80 (AO)	High

(AO) Aesthetic Objective

The results meet the Canadian Drinking Water Guidelines, although some results, listed as aesthetic guidelines, may have a bearing on the design of water treatment facilities should they be considered in the future.

6.2. Chemical Parameters

The Town is required to conduct bi-annual metals testing. Results for all three water sources are as follows in Table 12. All three water sources meet the Canadian Drinking Water Guidelines.

Table 12 Metals, Hardness Testing July 09, 2015

Maxxam ID		MP9972	MP9973	MP9974		
Sampling Date		2015-07-09 6:20	2015-07-09 6:45	2015-07-09 6:05		
COC Number		465623-01-01	465623-01-01	465623-01-01		
	UNITS	HOLLAND LAKE	STOCKING LAKE	CHICKEN LADDER	CDW/BC Guideline	Comments
Calculated Parameters						
Total Hardness (CaCO3)	mg/L	4.58	11.7	6.57	0.50	OK
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L	43.4	40.8	46.3	100	OK
Total Antimony (Sb)	ug/L	<.50	<0.50	<0.50	6	OK
Total Arsenic (As)	ug/L	0.13	0.15	0.15		OK
Total Barium (Ba)	ug/L	4.9	3.6	3.9	1000	OK
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10		
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0		
Total Boron (B)	ug/L	<50	<50	<50	500	OK
Total Cadmium (Cd)	ug/L	0.01	0.714	0.263	5	OK
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	50	OK

Table 12 (Cont'd)

Metals Testing – July, 2015

Total Cobalt (Co)	ug/L	<0.50	<0.50	<0.50		
Total Copper (Cu)	ug/L	2.21	1.54	4.06	1000	
Total Iron (Fe)	ug/L	338	91	96	300 AO	OK Except in Holland Lake
Total Lead (Pb)	ug/L	<0.20	<0.20	<0.20	1	OK
Total Lithium (Li)	ug/L	<5.0	<5.0	<5.0		
Total Manganese (Mn)	ug/L	38.3	5.2	2.7	50 AO	OK
Total Mercury (Hg)	ug/L	<0.01	<0.01	<0.01	0.01	OK
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	73	
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0		
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	2	OK
Total Silicon (Si)	ug/L	787	1750	1280		
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020		
Total Strontium (Sr)	ug/L	7.6	11.4	10.8		
Total Thallium (Tl)	ug/L	<0.050	<0.050	<0.050		
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0		
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0		
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10		
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0		
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	7.5	OK
Total Zirconium (Zr)	ug/L	<0.50	<0.50	<0.50		
Total Calcium (Ca)	mg/L	1.37	3.78	2.00		
Total Magnesium (Mg)	mg/L	0.285	.551	.379		
Total Potassium (K)	mg/L	0.153	.551	.379		
Total Sodium (Na)	mg/L	0.795	1.27	.991	< 200 AO	OK
Total Sulphur (S)	mg/L	<3.0	<3.0	<3.0		

Holland Lake has recorded iron levels of 189,79, and 338 ug/l in 2013,2014, and 2015. The 2015 reading appears to be an anomaly.

6.3. Other Chemical Parameters

The Town also tests for Alkalinity, Calcium, Bromide, and Hardness. Results of these tests are as follows:

Table 12 Holland Lake - Other Chemical Results

Parameter	No of Samples	Units	Ave	High	Low	CDW Guideline	Comments
Alkalinity	10	Mg/L	3.93	5.22	2.4	n/a	
Calcium	10	Mg/L	1.52	2.21	1.18	n/a	
Bromide	10	Mg/L	0.00	0.011	<0.01	n/a	

Table 134 Holland Creek (Chicken Ladder) - Other Chemical Results

Parameter	No of Samples	Units	Ave	High	Low	CDW Guideline	Comments
Alkalinity	10	Mg/L	5.54	7.49	3.7	n/a	
Calcium	10	Mg/L	2.002	2.38	1.67	n/a	
Bromide	10	Mg/L	0.00	<0.02	<0.01	n/a	

Table 14 Stocking Lake - Other Chemical Results

Parameter	No of Samples	Units	Ave	High	Low	CDW Guideline	Comments
Alkalinity	10	Mg/L	9.78	11.5	8.6	n/a	
Calcium	10	Mg/L	3.72	4.60	3.16	n/a	
Bromide	10	Mg/L	0.00	<0.10	<0.01	n/a	

6.3.1. Microbiological Parameters

The Town, through Island Health, conducts weekly tests for E.Coli and Total Coliforms of our distribution system (treated water). Tests are taken weekly, and are enclosed in Appendix E. The Town is required to meet the following standards set out by Island Health for our distribution system:

Parameter	Standard
Fecal Coliform Bacteria	No detectable fecal coliform bacteria per 100 ml
Escherichia Coli	No detectable Escherichia Coli per 100 ml
Total Coliform Bacteria	At least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform

The Town also tests our raw water sources for E-Coli and Total Coliforms. The E-Coli tests are used to determine generally eligibility for filtration deferral – in any 6 month period, no more than 10% of raw water samples can test over 20 cfu/100ml. Results for 2015 are summarized as follows:

Table 156 Source (Untreated) Water E-Coli and Total Coliform Results Holland Lake

Parameter	No of Samples	Units	Ave	High	Low	Samples > 20 (e-coli)	Comments
E-Coli	24	Cfu/100ml	3.08	8	<1	0.0% > 20 cfu/100ml	10% max
Total Coliforms	24	Cfu/100ml	751.58	1900	50	68% > 100 cfu/100ml	

Table 167 Source Water E-Coli and Total Coliform Results Holland Creek (Chicken Ladder)

Parameter	No of Samples	Units	Ave	High	Low	Samples > 20 (e-coli)	Comments
E-Coli	25	Cfu/100ml	12.0	57	<1	21.7% > 20 cfu/100ml	10% max Over Regulated allowable limit
Total Coliforms	25	Cfu/100ml	639.9	3200	36	71% >100 cfu/100ml	

Table 178 Source Water E-Coli and Total Coliform Results Stacking Lake

Parameter	No of Samples	Units	Ave	High	Low	Samples > 20 (e-coli)	Comments
E-Coli	25	Cfu/100ml	2.83	10	<1	0% > 20 cfu/100ml	10% max
Total Coliforms	25	Cfu/100ml	3119.9	35000	11	34% > 100 cfu/100ml	

For 2015, approximately 22% of the raw E-Coli tests for Chicken Ladder exceeded the maximum allowable E-Coli value of 20 cfu/100ml. This fails to meet the requirement for filtration deferral under VIHA's filtration deferral policy, similar to 2014.

6.4. Miscellaneous Parameters

THM Formation

Trihalomethanes (THM's) and Haloacetic Acids (HAA's) are formed as products of conventional chlorination within a water system. They are commonly referred to disinfection by-products. The Canadian Drinking Water guideline is 0.1 mg/L for THM's and 0.08 mg/L for HAA's.

A total of 8 tests were conducted within the water system in 2015 for each, as follows:

Table 189 THM Formation in Water System, in mg/L

	558 Hooper	1280 Rocky Creek	CDW Guideline	Comments
Date	THM	THM		
Mar.4/15	0.1	0.088	0.100	Marginally meets CDWG
Jun.124/15	0.073	0.076	0.100	Marginally meets CDWG
Sept.10/15	0.079	0.062	0.100	Marginally meets CDWG
Dec. 7/15	0.078	0.073	0.100	Marginally meets CDWG

Table 20 Total HAA Formation in Water System, in mg/L

	558 Hooper	1280 Rocky Creek	CDW Guideline	Comments
Mar. 4, 15	0.099	0.1	0.080	Marginally Fails CDWG
Jun. 24/15	0.089	0.083	0.080	Marginally Fails CDWG
Sept. 10/15	0.086	0.080	0.080	Marginally Fails CDWG
Dec. 7/15	0.076	0.070	0.080	Marginally Meets CDWG

Table 191 THM Component Results, in mg/L

Test Date	Component	558 Hooper	1280 Rocky Creek
Mar 4, 2015	Chloriform	0.100	0.088
Mar 4, 2015	Chlorodibromomethane	<0.001	<0.001
Mar 4, 2015	Bromodichloromethane	.0025	0.0023
Mar 4, 2015	Bromoform	<0.001	<0.001
June 24, 2015	Chloriform	0.073	0.076
June 24, 2015	Chlorodibromomethane	<0.001	<0.001
June 24, 2015	Bromodichloromethane	0.0027	0.0029
June 24, 2015	Bromoform	<0.001	<0.001
Sept 10, 2015	Chloriform	0.079	0.062
Sept 10, 2015	Chlorodibromomethane	<0.001	<0.001
Sept 10, 2015	Bromodichloromethane	.0038	0.0032
Sept 10, 2015	Bromoform	<0.001	<0.001
Dec 7, 2015	Chloriform	0.078	0.073
Dec 7, 2015	Chlorodibromomethane	<0.001	<0.001
Dec 7, 2015	Bromodichloromethane	.0033	0.0030
Dec 7, 2015	Bromoform	<0.001	<0.001

It should be noted that the HAA testing for 2015 marginally does not meet the current Canadian Drinking Water Quality Guidelines value of 80ug/l. This is consistent with results over the past 5 years.

Haloacetic Acids are referred to as “disinfection by-products”, which are caused by the process of chlorination. In the Town’s water supply, the principle cause of the higher HAA’s is the requirement to provide enough chlorine dosage to effectively disinfect all of the dissolved organic carbon and turbidity, both in the Holland Lake source as well as the Stocking Lake source. This is a typical situation for surface water supplies on Vancouver Island, particularly related to soft water supplies (surface, rainwater based). Higher PH water sources will often have higher THM’s, and lower HAA’s.

Reducing the chlorine dosage will reduce the amount of disinfection by-products, but runs the risk of ‘using up’ all of the residual chlorine in the distribution system, which is not acceptable from a health perspective (domestic water distribution systems must retain a chlorine residual in all parts of the distribution system at all times). The most effective method of reducing disinfection by-products is to remove turbidity (dirt) and dissolved organic carbon (often colorless to the naked eye), so that the chlorine dosage can consequently be reduced. This will allow a reasonable chlorine residual to be maintained in the system while keeping HAA’s (and THM’s) low as well.

The most effective means for doing this is to filter the water before chlorination. The Town has made the commitment to proceed with filtration, which is expected to be in operation by 2018. When this improvement is in place, we expect HAA and THM concentrations to be reduced dramatically.

The table and chart on the following page shows the HAA and THM component test results for the Town, taken quarterly, over the previous five years.

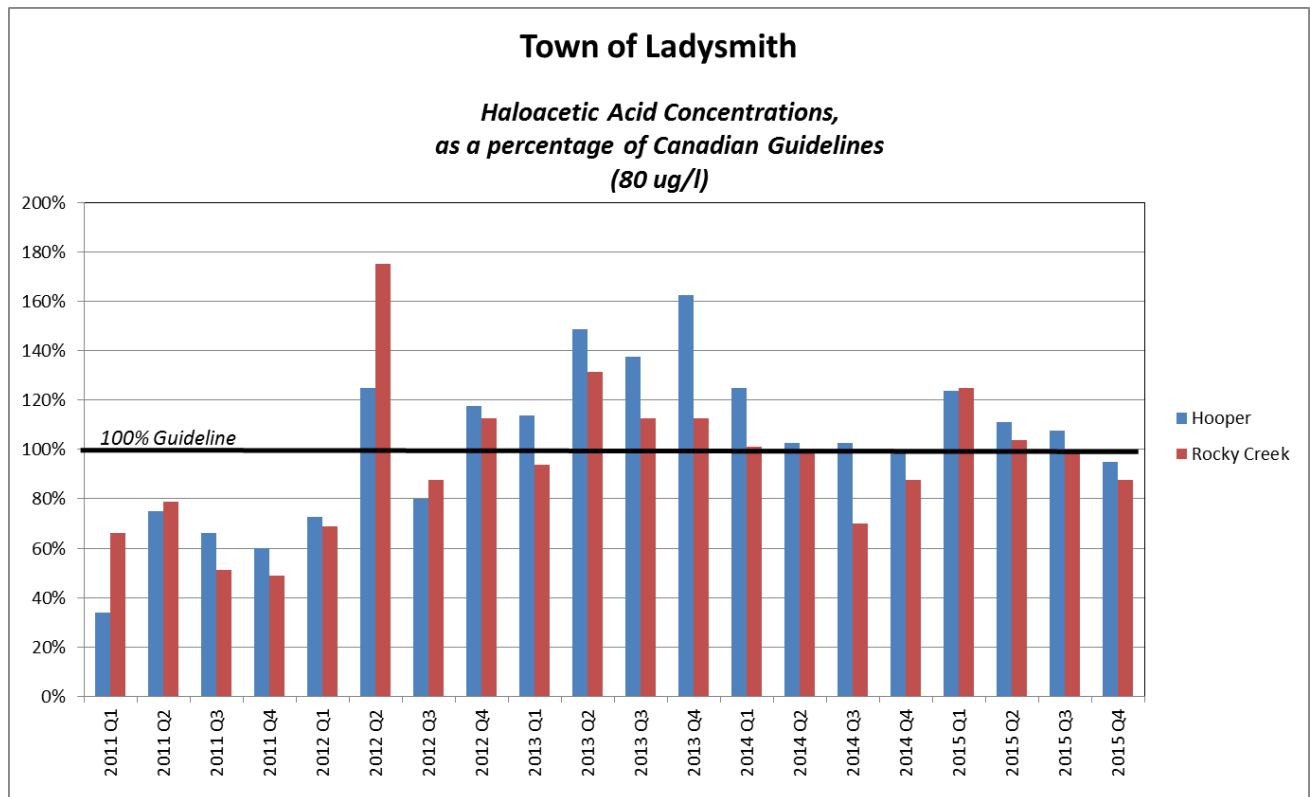
Health Canada has published an extensive review of the effects of Haloacetic Acids in drinking water, it can be accessed at:

<http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/haloaceti/index-eng.php>

A copy of Part One of the executive summary follows in Appendix D, and provides an overview of this issue.

Table 202 HAA Analysis: 2011 to 2015

Concentrations in micrograms per liter (ug/l)																	Total HAA's			
Year	Quarter	Seq	MCAA		MBAA		DCAA		TCAA		BCAA		DBAA		Total		% Can Guideline			
			Location		Location		Location		Location		Location		Location		Location		Location			
			Hooper	Rocky	Hooper	Rocky	Hooper	Rocky	Hooper	Rocky	Hooper	Rocky	Hooper	Rocky	Hooper	Rocky	Hooper	Rocky		
2011	1	1	ND	ND	ND	ND	12	20	15	33	ND	ND	ND	ND	27	53	34%	66%		
2011	2	2	ND	ND	ND	ND	22	27	38	36	ND	ND	ND	ND	60	63	75%	79%		
2011	3	3	1	1	ND	ND	20	10	32	30	ND	ND	ND	ND	53	41	66%	51%		
2011	4	4	1	2	ND	ND	20	12	27	25	ND	ND	ND	ND	48	39	60%	49%		
2012	1	5	ND	ND	2	ND	19	20	36	36	1	ND	ND	ND	58	55	73%	69%		
2012	2	6	ND	ND	ND	ND	34	60	68	83	ND	ND	ND	ND	100	140	125%	175%		
2012	3	7	ND	ND	ND	ND	19	23	45	47	ND	ND	ND	ND	64	70	80%	88%		
2012	4	8	ND	ND	ND	ND	29	30	65	60	ND	ND	ND	ND	94	90	118%	113%		
2013	1	9	ND	ND	ND	ND	34	29	57	46	ND	ND	ND	ND	91	75	114%	94%		
2013	2	10	ND	ND	ND	ND	56	49	63	56	ND	ND	ND	ND	119	105	149%	131%		
2013	3	11	ND	ND	ND	ND	55	48	55	42	ND	ND	ND	ND	110	90	138%	113%		
2013	4	12	ND	ND	ND	ND	53	37	77	52	ND	ND	ND	ND	130	90	163%	113%		
2014	1	13	ND	ND	ND	ND	45	36	58	55	ND	ND	ND	ND	100	81	125%	101%		
2014	2	14	ND	ND	ND	ND	47	42	35	37	ND	ND	ND	ND	82	79	103%	99%		
2014	3	15	ND	ND	ND	ND	38	19	44	37	ND	ND	ND	ND	82	56	103%	70%		
2014	4	16	ND	ND	ND	ND	22	27	58	43	ND	ND	ND	ND	79	70	99%	88%		
2015	1	17	ND	ND	ND	ND	30	33	70	70	ND	ND	ND	ND	99	100	124%	125%		
2015	2	18	ND	ND	ND	ND	35	34	53	50	ND	ND	ND	ND	89	83	111%	104%		
2015	3	19	ND	ND	ND	ND	20	28	67	52	ND	ND	ND	ND	86	80	108%	100%		
2015	4	20	ND	ND	ND	ND	21	25	55	45	ND	ND	ND	ND	76	70	95%	88%		
5 Year Average							31.6	30.5	50.9	46.8					82.4	76.5	103%	96%		
															5 Year Average, both locations:		79.4			
Actual Percentage of DCA's to HAA's															39.0%		2 Year (2014,2015) Average, both locations:		82.0	



7. Watershed Management

Both Holland and Stocking Lake watersheds are jointly used 'semi-closed' watersheds, owned and managed by a number of parties, including:

- Town of Ladysmith;
- Ministry of Forests, Lands and Natural Resource Operations (MFNRO);
- TimberWest Forest Corporation (TimberWest);
- Cowichan Valley Regional District (CVRD).

MFNRO leases some of the lands to private third parties and First Nations principally for forestry use.

There are not any public roads within the watershed area, but are predominately private forest access roads that are jointly used by the parties.

The public is encouraged to use a recreational trail system within the watershed, and includes trails that are adjacent to both Holland and Stocking Lakes. The Town maintains a well-used trail system that includes the above noted trail routes. Signs are posted at a number of strategic locations prohibiting vehicle access to the Lakes, and recreational lake use such as boating, swimming, and fishing is prohibited.

7.1. Security

The Town jointly manages a number of gates within the Holland and Stocking Lakes Watersheds that control access into Holland and Stocking Lakes. These gates are normally left in a locked state, except when active logging activities are taking place. Town staff travel to both Lakes on a minimum weekly basis.

In recent years, the Town has observed instances where 4 wheel ATV vehicles have entered the area by by-passing the locked gates, and the Town and Timberwest has been working to prevent this activity through the use of ditching and other means to block access into the area, with some success.

The Town also posts signs at entrances to both Lakes advising that public access to the lakes is not permitted. The Town continues to see evidence of occasional camping and recreational activity around the lakes, particularly Holland Lake which is more remote than Stocking Lake.

The Town has been working with the various stakeholders of the southern access area (South Watts Road) to improve the gate at that location, possibly through the use of access cards and video security, as this gate is located nearer a source of power. Funds have been allocated in the capital budget for this purpose.

8. Routine Maintenance Program

The Town has a regular maintenance program that is described briefly as follows:

8.1. Distribution

- Water mains are flushed using a unidirectional flushing program
- Air relief valves are cleaned
- Fireline meters are cleaned
- Fire Hydrants are completely disassembled and inspected on a 2 year rotation
- Paint and brush out around hydrants as needed
- All irrigation backflow prevention devices tested and repaired if needed

8.2. Source Intakes

- Winter maintenance of chlorination system while off line
- Weekly blowing of air lines through intake screens
- Daily checks of pump flows and chlorine levels
- Monthly calibration of turbidity analyzers

8.3. Reservoirs

- Daily security check of tanks and compounds
- Yearly cleaning
- Clean Reservoir using divers every 5 years.

8.4. Pump Stations

- Daily checks of pumps and chlorination system
- Security checks of compounds
- Bi-Annual calibration of chlorine analyzers and turbidimeters

The Town trains it's staff in accordance with current industry practises and requirements, and staff are certified to work on our system as required in the Town's Operating Permit.

9. Capital Planning

A summary of the major capital projects projected over the next 10 years is as follows:

Table 21 – Long Term Capital Plan

Title	Description	Purpose	Start Year	Cost
Chlorination Facility	Construction of a new Chlorination Facility	To upgrade the present chlorination facility.	2013	\$1,500,000
Stocking Lake Supply Main Replacement - Phase I	Replacement of the existing AC watermain from Stocking Lake to the balancing reservoir.	To provide a more secure Supply main.	2015	\$800,000
Watermain Replacement Program	Annual Capital Watermain Replacement Program in the Town's Distribution System.	To replace aging AC and Cast Iron mains throughout the distribution system.	annual	\$300,000
Holland to Stocking Supply Main	New Supply main to connect Stocking Supply Main with Holland Lake.	To provide a direct system connection from Holland Lake to the Town's water system.	2018	\$5,400,000
Stocking Lake Supply Main Replacement - Phase II	Replacement of the AC Supply watermain from balancing reservoir to the Old Chlorination Station.	To provide a more secure Supply Main.	2022	\$2,000,000
Water Filtration Project	Design and Construction for new Water Filtration Plant near Arbutus Reservoir.	To provide Filtration as per VIHA 4-3-2-1 Water Supply Rule.	2018	\$6,265,000
Holland Dam Capacity Increase	Doubling of current storage at Holland Dam	To provide for future water supply needs	2019-2012	\$6,000,000
Replace Holland Supply Main: Public Works Yard to Colonia	Replacement of old AC supply main along the Holland Creek Trail	To provide a more secure Supply main.	2018	\$400,000
Arbutus Reservoir - Capacity Increase	Doubling of Arbutus Reservoir	For future development	2023	\$2,720,000
New Upper Pressure Zone Reservoir	To service Couverdon, possibly others.	For development in upper zone	2021	\$2,000,000
Upper Pressure Zone - Pump Station		For development in upper zone	2021	\$900,000
10 year Plan - Cost of 'Major' Projects Only				\$30,000,000

Appendix A – Canadian Drinking Water Quality Guidelines

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 1 – Microbiological Parameters

Parameter (approval)	Guideline	Common sources	Health considerations	Applying the guideline
Bacterial waterborne pathogens (2006)	None required	Human and animal faeces; some are naturally occurring	Commonly associated with gastrointestinal upset (nausea, vomiting, diarrhoea); some pathogens may infect the lungs, skin, eyes, central nervous system or liver.	Use multi-barrier approach to reduce pathogens to levels that are non-detectable or not associated with illness.
Enteric viruses (2011)	Treatment goal: Minimum 4 log reduction and/or inactivation of enteric viruses	Human and animal faeces	Commonly associated with gastrointestinal upset (nausea, vomiting, diarrhoea); less common health effects can include respiratory symptoms, central nervous system infections, liver infections and muscular syndromes.	Routine monitoring for viruses is not practical; where possible, characterize source water to determine if greater than a 4 log removal or inactivation is necessary.
<i>Escherichia coli</i> (<i>E. coli</i>) (2006)	MAC: None detectable per 100 mL	Human and animal faeces	The presence of <i>E. coli</i> indicates recent faecal contamination and the potential presence of microorganisms capable of causing gastrointestinal illnesses; pathogens in human and animal faeces pose the most immediate danger to public health.	<i>E. coli</i> is used as an indicator of the microbiological safety of drinking water; if detected, enteric pathogens may also be present.
Heterotrophic plate count (HPC) (2006)	None required	Naturally occurring	HPC results are not an indicator of water safety and should not be used as an indicator of potential adverse human health effects; HPC is a useful operational tool for monitoring general bacteriological water quality through the treatment process and in the distribution system.	If increases in HPC values above baseline levels occur, the system should be inspected to determine the cause; HPC should be minimized through effective treatment and disinfection and remain constant over time.
Protozoa: <i>Giardia</i> and <i>Cryptosporidium</i> (2004)	Treatment goal: Minimum 3 log reduction and/or inactivation	Human and animal faeces	Commonly associated with gastrointestinal upset (nausea, vomiting, diarrhoea); less common health effects can include respiratory symptoms, central nervous system infections, liver infections and muscular syndromes.	Monitoring for <i>Cryptosporidium</i> and <i>Giardia</i> in source waters will provide valuable information for assessing treatment requirements.

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 1 – Microbiological Parameters

Parameter (approval)	Guideline	Common sources	Health considerations	Applying the guideline
Total coliforms (2006)	<p><i>At exit of municipal treatment plant or throughout semi-public systems:</i> MAC of none detectable/100 mL</p> <p><i>In municipal distribution systems:</i> No consecutive samples or no more than 10% of samples should contain total coliforms</p>	Human and animal faeces; naturally occurring in water, soil and vegetation	Total coliforms are not used as indicators of potential health effects from pathogenic microorganisms; they are used as an operational tool to determine how well the drinking water treatment system is operating.	In water leaving a treatment plant, the presence of total coliforms indicates that the water has been inadequately treated and may contain pathogenic microorganisms; in semi-public systems, the presence of total coliforms generally indicates that the system is vulnerable to contamination and that additional actions need to be taken; in a distribution and storage system, detection of total coliforms can indicate regrowth of the bacteria in distribution system biofilms or intrusion of untreated water; thus, exceedances of the distribution system goal should be investigated.
Turbidity (2003)	<p>Guideline Treated water < 0.1 NTUTable 1 footnote1at all times. Where not achievable: ≤ 0.3 NTUTable 1 footnote2 ≤ 1.0 NTUTable 1 footnote3 ≤ 0.1 NTUTable 1 footnote4</p>	<p>Naturally occurring particles:</p> <p><i>Inorganic:</i> clays, silts, metal precipitates</p> <p><i>Organic:</i> decomposed plant & animal debris, microorganisms</p>	Indirect associations: particles can harbour microorganisms, protecting them from disinfection, and can entrap heavy metals and biocides; elevated or fluctuating turbidity in filtered water can indicate a problem with the water treatment process and a potential increased risk of pathogens in treated water.	Guidelines apply to individual filter turbidity for systems that use surface water or GUDI; drinking water from some sources may meet exemption criteria from filtration requirements established by the appropriate authority; increases in distribution system turbidity can be indicative of deteriorating water quality and should be investigated.

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
T	Aluminum (1998)		OG:	Aluminum salts used as coagulants in drinking water treatment; naturally occurring		Current weight of evidence does not indicate adverse health effects at levels found in drinking water.
			< 0.1 (conventional treatment);			
			< 0.2 (other treatment types)			
I	Ammonia (1987)	None required		Naturally occurring; released from agricultural or industrial wastes; added as part of chloramination for drinking water disinfection		Guideline value not necessary as it is produced in the body and efficiently metabolized in healthy people; no adverse effects at levels found in drinking water.
I	Antimony (1997)	0.006		Naturally occurring (erosion); soil runoff; industrial effluents; leaching from plumbing materials and solder	Health basis of MAC: Microscopic changes in organs and tissues (thymus, kidney, liver, spleen, thyroid)	MAC takes into consideration analytical achievability; plumbing should be thoroughly flushed before water is used for consumption.
I	Arsenic (2006)	0.01		Naturally occurring (erosion and weathering of soils, minerals, ores)	Health basis of MAC: Cancer (lung, bladder, liver, skin) (classified as human carcinogen)	MAC based on treatment achievability; elevated levels associated with certain groundwaters; levels should be kept as low as reasonably achievable.
		ALARA				
I	Asbestos (1989, 2005)	None required		Naturally occurring (erosion of asbestos minerals and ores); decay of asbestos-cement pipes		Guideline value not necessary; no evidence of adverse health effects from exposure through drinking water.
P	Atrazine (1993)	0.005		Leaching and/or runoff from agricultural use	Health basis of MAC: Developmental effects (reduced body weight of offspring)	MAC applicable to the sum of atrazine and its <i>N</i> -dealkylated metabolites; persistent in source waters.
					Other: Potential increased risk of ovarian cancer or lymphomas (classified as possible carcinogen)	

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
P	Azinphos-methyl (1989, 2005)	0.02		Leaching and/or runoff from agricultural use	Health basis of MAC: Neurological effects (plasma cholinesterase)	All uses to be phased out by 2012.
I	Barium (1990)	1		Naturally occurring; releases or spills from industrial uses	Health basis of MAC: Increases in blood pressure, cardiovascular disease	
O	Benzene (2009)	0.005		Releases or spills from industrial uses	Health basis of MAC: Bone marrow (red and white blood cell) changes and cancer (classified as human carcinogen) Other: Blood system and immunological responses	MAC considers additional exposure through showering and bathing; drinking water is generally a minor source of exposure.
O	Benzo[a]pyrene (1988, 2005)	0.000 01		Leaching from liners in water distribution systems	Health basis of MAC: Stomach tumours (classified as probable carcinogen)	
I	Boron (1990)	5		Naturally occurring; leaching or runoff from industrial use	Health basis of MAC: Reproductive effects (testicular atrophy, spermatogenesis) Other: Limited evidence of reduced sexual function in men	MAC based on treatment achievability.
DBP	Bromate (1998)	0.01		By-product of drinking water disinfection with ozone; possible contaminant in hypochlorite solution	Health basis of MAC: Renal cell tumours (classified as probable carcinogen)	MAC based on analytical and treatment achievability
P	Bromoxynil (1989, 2005)	0.005		Leaching or runoff from agricultural use	Health basis of MAC: Reduced liver to body weight ratios	
I	Cadmium (1986, 2005)	0.005		Leaching from galvanized pipes, solders or black polyethylene pipes; industrial and municipal waste	Health basis of MAC: Kidney damage and softening of bone	
I	Calcium (1987, 2005)	None required		Naturally occurring (erosion and weathering of soils, minerals, ores)		Guideline value not necessary, as there is no evidence of adverse health effects from calcium in drinking water; calcium contributes to hardness

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
P	Carbaryl (1991, 2005)	0.09		Leaching or runoff from agricultural use	Health basis of MAC: Decreased kidney function (may be rapidly reversible after exposure ceases)	
P	Carbofuran (1991, 2005)	0.09		Leaching or runoff from agricultural use	Health basis of MAC: Nervous system effects (cholinesterase inhibition) and growth suppression	
O	Carbon tetrachloride (2010)	0.002		Industrial effluents and leaching from hazardous waste sites	Health basis of MAC: Liver toxicity Other: Kidney damage; liver tumours (classified as probable carcinogen)	MAC considers additional exposure through showering and bathing
D	Chloramines (1995)	3		Monochloramine is used as a secondary disinfectant; formed in presence of both chlorine and ammonia	Health basis of MAC: Reduced body weight gain Other: immunotoxicity effects	MAC is for total chloramines based on health effects associated with monochloramine and analytical achievability
DBP	Chlorate (2008)	1		By-product of drinking water disinfection with chlorine dioxide; possible contaminant in hypochlorite solution	Health basis of MAC: Thyroid gland effects (colloid depletion)	Formation of chlorate ion should be prevented, as it is difficult to remove once formed; chlorate formation should be controlled by respecting the maximum feed dose of 1.2 mg/L of chlorine dioxide and managing /monitoring formation in hypochlorite solutions.
I	Chloride (1979, 2005)		AO: ≤ 250	Naturally occurring (seawater intrusion); dissolved salt deposits, highway salt, industrial effluents, oil well operations, sewage, irrigation drainage, refuse leachates		Based on taste and potential for corrosion in the distribution system

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
D	Chlorine (2009)	None required		Used as drinking water disinfectant	Guideline value not necessary due to low toxicity at concentrations found in drinking water	Free chlorine concentrations in most Canadian drinking water distribution systems range from 0.04 to 2.0 mg/L
D	Chlorine dioxide (2008)	None required		Used as drinking water disinfectant	A guideline for chlorine dioxide is not required because of its rapid reduction to chlorite in drinking water	A maximum feed dose of 1.2 mg/L of chlorine dioxide should not be exceeded to control the formation of chlorite and chlorate
DBP	Chlorite (2008)	1		By-product of drinking water disinfection with chlorine dioxide	Health basis of MAC: Neurobehavioural effects (lowered auditory startle amplitude, decreased exploratory activity), decreased absolute brain weight, altered liver weights	Chlorite formation should be controlled by respecting the maximum feed dose of 1.2 mg/L of chlorine dioxide and managing /monitoring formation in hypochlorite solutions.
P	Chlorpyrifos (1986)	0.09		Leaching and/or runoff from agricultural or other uses	Health basis of MAC: Nervous system effects (cholinesterase inhibition)	Not expected to leach significantly into groundwater
I	Chromium (1986)	0.05		Naturally occurring (erosion of minerals); releases or spills from industrial uses	Health basis of MAC: Enlarged liver, irritation of the skin, respiratory and gastrointestinal tracts from chromium (VI)	Chromium (III) is an essential element; MAC is protective of health effects from chromium (VI)
T	Colour (1979, 2005)		AO: ≤ 15 TCU	Naturally occurring organic substances, metals; industrial wastes		May interfere with disinfection; removal is important to ensure effective treatment
I	Copper (1992)		AO: ≤ 1.0	Naturally occurring; leaching from copper piping	Copper is an essential element in human metabolism. Adverse health effects occur at levels much higher than the aesthetic objective	Based on taste, staining of laundry and plumbing fixtures; plumbing should be thoroughly flushed before water is used for consumption
I	Cyanide (1991)	0.2		Industrial and mining effluents; release from organic compounds	Health basis of MAC: No clinical or other changes at the highest dose tested	Health effects from cyanide are acute; at low levels of exposure, it can be detoxified to a certain extent in the human body

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
O	Cyanobacterial toxins--Microcystin-LR (2002)	0.0015		Naturally occurring (released from blooms of blue-green algae)	Health basis of MAC: Liver effects (enzyme inhibitor)	MAC is protective of total microcystins; avoid algicides like copper sulphate, as they may cause toxin release into water
					Other: Classified as possible carcinogen	
P	Diazinon (1986, 2005)	0.02		Runoff from agricultural or other uses	Health basis of MAC: Nervous system effects (cholinesterase inhibition)	Not expected to leach significantly into groundwater
P	Dicamba (1987, 2005)	0.12		Leaching or runoff from agricultural or other uses	Health basis of MAC: Liver effects	Readily leaches into groundwater
					(vacuolization, necrosis, fatty deposits and liver weight changes)	
O	1,2-Dichlorobenzene Table 2 footnote 2 (1987)	0.2	AO: ≤ 0.003	Releases or spills from industrial effluents	Health basis of MAC: Increased blood cholesterol, protein and glucose levels	AO based on odour; levels above the AO would render drinking water unpalatable
O	1,4-Dichlorobenzene Table 2 footnote 2 (1987)	0.005	AO: ≤ 0.001	Releases or spills from industrial effluents; use of urinal deodorants	Health basis of MAC: Benign liver tumours and adrenal gland tumours (classified as probable carcinogen)	AO based on odour; levels above the AO would render drinking water unpalatable
O	1,2-Dichloroethane (1987)	0.005		Releases or spills from industrial effluents; waste disposal	Health basis of MAC: Cancer of the circulatory system (classified as probable carcinogen)	MAC based on treatment and analytical achievability
O	1,1-Dichloroethylene (1994)	0.014		Releases or spills from industrial effluents	Health basis of MAC: Liver effects (fatty changes)	
O	Dichloromethane (2011)	0.05		Industrial and municipal wastewater discharges	Health basis of MAC: Liver effects (liver foci and areas of cellular alteration).	MAC is protective of carcinogenic effects and considers additional exposure through showering and bathing
					Other: Classified as probable carcinogen	
O	2,4-Dichlorophenol (1987, 2005)	0.9	AO: ≤ 0.0003	By-product of drinking water disinfection with chlorine; releases from industrial	Health basis of MAC: Liver effects (cellular changes)	AO based on odour; levels above the AO would render drinking water unpalatable

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
				effluents		
P	2,4-Dichlorophenoxy acetic acid (2,4-D) (1991)	0.1		Leaching and/or runoff from use as a weed controller; releases from industrial effluents	Health basis of MAC: Kidney effects (tubular cell pigmentation)	
P	Diclofop-methyl (1987, 2005)	0.009		Leaching and/or runoff from use as a weed controller; added directly to water to control aquatic weeds	Health basis of MAC: Liver effects (enlargement and enzyme changes)	Low potential for groundwater contamination
P	Dimethoate (1986, 2005)	0.02		Leaching and/or runoff from residential, agricultural and forestry use	Health basis of MAC: Nervous system effects (cholinesterase inhibition)	
P	Diquat (1986, 2005)	0.07		Leaching and/or runoff from agricultural use; added directly to water to control aquatic weeds	Health basis of MAC: Cataract formation	Unlikely to leach into groundwater
P	Diuron (1987, 2005)	0.15		Leaching and/or runoff from use in controlling vegetation	Health basis of MAC: Weight loss, increased liver weight and blood effects	High potential to leach into groundwater
O	Ethylbenzene (1986, 2005)		AO: ≤ 0.0024	Emissions, effluents or spills from petroleum and chemical industries		Based on odour
I	Fluoride (2010)	1.5		Naturally occurring (rock and soil erosion); may be added to promote dental health	Health basis of MAC: Moderate dental fluorosis (based on cosmetic effect, not health)	Beneficial in preventing dental caries
DBP	Formaldehyde (1997)	None required		By-product of disinfection with ozone; releases from industrial effluents		Guideline value not necessary, as levels in drinking water are below the level at which adverse health effects may occur

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/IL)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
O	Gasoline and its organic constituents (1986, 2005)	None required		Spill or leaking storage tank		No MAC due to complex composition of gasoline; strong taste and odour at concentrations well below those potentially eliciting adverse health effects (see benzene, ethylbenzene, toluene and xylenes for more information)
P	Glyphosate (1987, 2005)	0.28		Leaching and/or runoff from various uses in weed control	Health basis of MAC: Reduced body weight gain	Not expected to migrate to groundwater gain
DBP	Haloacetic acids - Total (HAAs)Table 2 footnote3(2008)	0.08		By-product of drinking water disinfection with chlorine	Health basis of MAC: Liver cancer (DCA); DCA is classified as probably carcinogenic to humans	Refers to the total of monochloroacetic acid (MCA), dichloroacetic acid (DCA), trichloroacetic acid (TCA), monobromoacetic acid (MBA) and dibromoacetic acid (DBA); MAC is based on ability to achieve HAA levels in distribution systems without compromising disinfection; precursor removal limits formation
		ALARA			Other: Other organ cancers (DCA, DBA, TCA); liver and other organ effects (body, kidney and testes weights) (MCA)	
T	Hardness (1979)	None required		Naturally occurring (sedimentary rock erosion and seepage, runoff from soils); levels generally higher in groundwater	Although hardness may have significant aesthetic effects, a guideline has not been established because public acceptance of hardness may vary considerably according to the local conditions; major contributors to hardness -- calcium and magnesium -- are not of direct public health concern	Hardness levels between 80 and 100 mg/L (as CaCO ₃) provide acceptable balance between corrosion and incrustation; where a water softener is used, a separate unsoftened supply for cooking and drinking purposes is recommended

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
I	Iron (1978, 2005)		AO: ≤ 0.3	Naturally occurring (erosion and weathering of rocks and minerals); acidic mine water drainage, landfill leachates, sewage effluents and iron-related industries		Based on taste and staining of laundry and plumbing fixtures; no evidence exists of dietary iron toxicity in the general population
I	Lead (1992)	0.01		Leaching from plumbing (pipes, solder, brass fittings and lead service lines)	<p>Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years)</p> <p>Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans</p>	Because the MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building
I	Magnesium (1978)	None required		Naturally occurring (erosion and weathering of rocks and minerals)		Guideline value not necessary, as there is no evidence of adverse health effects from magnesium in drinking water
P	Malathion (1986, 2005)	0.19		Leaching and/or runoff from agricultural and other uses	Health basis of MAC: Nervous system effects (cholinesterase inhibition)	Not expected to leach into groundwater
I	Manganese (1987)		AO: ≤ 0.05	Naturally occurring (erosion and weathering of rocks and minerals)		Based on taste and staining of laundry and plumbing fixtures
I	Mercury (1986)	0.001		Releases or spills from industrial effluents; waste disposal; irrigation or drainage of areas where agricultural pesticides are used	Health basis of MAC: Irreversible neurological symptoms	Applies to all forms of mercury; mercury generally not found in drinking water, as it binds to sediments and soil

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/IL)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
P	2-Methyl-4-chlorophenoxyacetic acid (MCPA) (2010)	0.1		Leaching and/or runoff from agricultural and other uses	Health basis of MAC: Kidney effects (increased absolute and relative weights, urinary bilirubin, crystals and pH)	Can potentially leach into groundwater
					Other: Systemic, liver, testicular, reproductive/developmental and nervous system effects	
O	Methyl tertiary-butyl ether (MTBE) (2006)		AO: ≤ 0.015	Spills from gasoline refineries, filling stations and gasoline-powered boats; seepage into groundwater from leaking storage tanks	There exist too many uncertainties and limitations in the MTBE database to develop a health based guideline.	AO based on odour; levels above the AO would render water unpalatable; as the AO is lower than levels associated with potential toxicological effects, it is considered protective of human health.
P	Metolachlor (1986)	0.05		Leaching and/or runoff from agricultural or other uses	Health basis of MAC: Liver lesions and nasal cavity tumours	Readily binds to organic matter in soil; little leaching expected in soils with high organic and clay content
P	Metribuzin (1986, 2005)	0.08		Leaching and/or runoff from agricultural use	Health basis of MAC: Liver effects (increased incidence and severity of mucopolysaccharide droplets)	Leaching into groundwater depends on the organic matter content of the soil
O	Monochlorobenzene (1987)	0.08	AO: ≤ 0.03	Releases or spills from industrial effluents	Health basis of MAC: Reduced survival and body weight gain	AO based on odour; levels above the AO would render water unpalatable
I	Nitrate/nitrite (1987)	<i>Nitrate:</i> 45 as nitrate; 10 as nitrate-nitrogen	<i>Nitrite (if measured separately):</i> 3.2 as nitrite; 1.0 as nitrite-nitrogen	Naturally occurring; leaching or runoff from agricultural fertilizer use, manure and domestic sewage; may be produced from excess ammonia or from microbial activity in distribution systems	Health basis of MAC: Methaemoglobinaemia (blue baby syndrome) in infants less than 3 months old (short term)	MACs are protective of children and adults; systems using chloramine disinfection or that have naturally occurring ammonia should monitor nitrite and nitrate in distribution system
					Other: Classified as possible carcinogen	
I	Nitritotriacetic acid (NTA) (1990)	0.4		Sewage contamination	Health basis of MAC: Kidney effects (nephritis and nephrosis)	

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
					Other: Classified as possible carcinogen	
DBP	<i>N</i> -Nitroso dimethylamine (NDMA) (2010)	0.000 04		By-product of drinking water disinfection with chlorine or chloramines; industrial and sewage treatment plant effluents	Health basis of MAC: Liver cancer (classified as probable carcinogen)	MAC considers additional exposure through showering and bathing; levels should be kept low by preventing formation during treatment
A	Odour (1979, 2005)		Inoffensive	Biological or industrial sources		Important to provide drinking water with no offensive odour, as consumers may seek alternative sources that are less safe
P	Paraquat (1986, 2005)	0.01 as paraquat dichloride; 0.007 as paraquat ion		Leaching and/or runoff from agricultural and other uses; added directly to water to control aquatic weeds	Health basis of MAC: Various effects on body weight, spleen, testes, liver, lungs, kidney, thyroid, heart and adrenal gland	Entry into drinking water unlikely from crop applications (clay binding); however, may persist in water for several days if directly applied to water
O	Pentachlorophenol (1987, 2005)	0.06	AO: ≤ 0.03	By-product of drinking water disinfection with chlorine; industrial effluents	Health basis of MAC: Reduced body weight, changes in clinical parameters, histological changes in kidney and liver, reproductive effects (decreased neonatal survival and growth)	AO based on odour; levels above the AO would render drinking water unpalatable
T	pH (1979)		6.5-8.5 Table 2 footnote4	Not applicable		pH can influence the formation of disinfection by-products and effectiveness of treatment
P	Phorate (1986, 2005)	0.002		Leaching and/or runoff from agricultural and other uses	Health basis of MAC: Nervous system effects (cholinesterase inhibition)	Some potential to leach into groundwater
P	Picloram (1988, 2005)	0.19		Leaching and/or runoff from agricultural and other uses	Health basis of MAC: Changes in body and liver weights and clinical chemistry parameters Other: Kidney effects (liver to body weight ratios and histopathology)	Significant potential to leach into groundwater

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
I	Selenium (1992)	0.01		Naturally occurring (erosion and weathering of rocks and soils)	Health basis of MAC: Essential nutritional element	Most exposure from food; little information on toxicity of selenium from drinking water
					Other: Hair loss and weakened nails at extremely high levels of exposure	
I	Silver (1986, 2005)	None required		Naturally occurring (erosion and weathering of rocks and soils)		Guideline value not required as drinking water contributes negligibly to an individual's daily intake
P	Simazine (1986)	0.01		Leaching and/or runoff from agricultural and other uses	Health basis of MAC: Body weight changes and effects on serum and thyroid gland	Extent of leaching decreases with increasing organic matter and clay content
I	Sodium (1979)		AO: ≤ 200	Naturally occurring (erosion and weathering of salt deposits and contact with igneous rock, seawater intrusion); sewage and industrial effluents; sodium-based water softeners		Based on taste; where a sodium-based water softener is used, a separate unsoftened supply for cooking and drinking purposes is recommended
I	Sulphate (1994)		AO: ≤ 500	Industrial wastes	High levels (above 500 mg/L) can cause physiological effects such as diarrhoea or dehydration	Based on taste; health authorities should be notified of drinking water sources containing above 500 mg/L
I	Sulphide (1992)		AO: ≤ 0.05	Can occur in the distribution system from the reduction of sulphates by sulphate-reducing bacteria; industrial wastes		Based on taste and odour; levels above the AO would render water unpalatable
A	Taste (1979, 2005)		Inoffensive	Biological or industrial sources		Important to provide drinking water with no offensive taste, as consumers may seek alternative sources that are less safe

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
T	Temperature (1979, 2005)		AO: ≤ 15°C	Not applicable		Temperature indirectly affects health and aesthetics through impacts on disinfection, corrosion control and formation of biofilms in the distribution system
P	Terbufos (1987, 2005)	0.001		Leaching and/or runoff from agricultural and other uses	Health basis of MAC: Nervous system effects (cholinesterase inhibition)	Based on analytical achievability
O	Tetrachloroethylene (1995)	0.03		Industrial effluents or spills	Health basis of MAC: Increased liver and kidney weights Other: Classified as possible carcinogen; limited evidence of an increased risk of spontaneous abortion	Readily leaches into groundwater; MAC considers additional exposure through showering and bathing
O	2,3,4,6-Tetrachlorophenol (1986, 2005)	0.1	AO: ≤ 0.001	By-product of drinking water disinfection with chlorine; industrial effluents and use of pesticides	Health basis of MAC: Developmental effects (embryotoxicity)	AO based on odour; levels above the AO would render drinking water unpalatable
O	Toluene (1986, 2005)		AO: ≤ 0.024	Release of effluents or spills from petroleum and chemical industries		AO based on odour; levels above the AO would render drinking water unpalatable
A	Total dissolved solids (TDS) (1991)		AO: ≤ 500	Naturally occurring; sewage, urban and agricultural runoff, industrial wastewater		Based on taste; TDS above 500 mg/L results in excessive scaling in water pipes, water heaters, boilers and appliances; TDS is composed of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, chloride, sulphate and nitrate
O	Trichloroethylene (2005)	0.005		Industrial effluents and spills from improper disposal	Health basis of MAC: Developmental effects (heart malformations) Other: Classified as probable carcinogen	MAC considers additional exposure through showering and bathing
O	2,4,6-Trichlorophenol (1987, 2005)	0.005	AO: ≤ 0.002	By-product of drinking water disinfection with chlorine; industrial	Health basis of MAC: Liver cancer (classified as probable carcinogen)	AO based on odour; levels above the AO would render drinking water unpalatable

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
				effluents and spills		
P	Trifluralin (1989, 2005)	0.045		Runoff from agricultural uses	Health basis of MAC: Changes in liver and spleen weights and in serum chemistry	Unlikely to leach into groundwater
DBP	Trihalomethanes Table 2 footnote 3 (THMs) (2006)	0.1		By-product of drinking water disinfection with chlorine; industrial effluents	<p>Health basis of MAC: Liver effects (fatty cysts) (chloroform classified as possible carcinogen)</p> <p>Other: Kidney and colorectal cancers</p>	Considers the most commonly found THMs, namely chlorodibromomethane, chloroform, bromodichloromethane and bromoform; MAC based on health effects of chloroform and considers additional exposure through showering and bathing; precursor removal limits formation
I	Uranium (1999)	0.02		Naturally occurring (erosion and weathering of rocks and soils); mill tailings; emissions from nuclear industry and combustion of coal and other fuels; phosphate fertilizers	Health basis of MAC: Kidney effects (various lesions); may be rapidly reversible after exposure ceases	Based on treatment achievability; MAC based on chemical effects, as uranium is only weakly radioactive; uranium is rapidly eliminated from the body
O	Vinyl chloride (1992)	0.002		Industrial effluents; degradation product from trichloroethylene and tetrachloroethylene in groundwater; leaching from polyvinyl chloride pipes	<p>Health basis of MAC: Liver cancer (classified as human carcinogen)</p> <p>Other: Raynaud's disease, effects on bone, circulatory system, thyroid, spleen, central nervous system</p>	Based on treatment and analytical achievability; leaching from polyvinyl chloride pipe is not expected to be significant
O	Xylene (1986, 2005)		AO: ≤ 0.3	Industrial effluents and spills		AO based on taste and odour; levels above the AO would render water unpalatable

Guidelines for Canadian Drinking Water Quality (Aug 2012)

Table 2 - Chemical and Physical Properties

Type	Parameter approval, OR reaffirmation	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
I	Zinc (1979, 2005)		AO: ≤ 5.0	Naturally occurring; industrial and domestic emissions; leaching may occur from galvanized pipes, hot water tanks and brass fittings		AO based on taste; water with zinc levels above the AO tends to be opalescent and develops a greasy film when boiled; plumbing should be thoroughly flushed before water is consumed

Appendix B - Water Quality Test Results - 2015

Holland Lake

Date	Coliforms				Alkalinity	Calcium	Bromide	TDS	PH	Colour		Turbidity	DOC	TOC	UVT	THM
	total	fecal	non-coli	E-coli						TCU	ACU					
Jan 15/15	530			<1				12		24	33	1.2	2.82	2.49	74.7	
Feb 5/15	50			<1				57		17	19	0.9	2.24	3.12	96.9	
Feb 12/15										14	17	0.8				
Feb 19/15	320			1						18	20	0.8			75.7	
Feb 26/15	460			<1				<10		32	15	0.45	2.85	3.58	77.1	
Mar 5/15	610			<1				16	6.67	30	10	0.47	3.16	2.93	77.6	
Mar 12/15								<10	6.89	28.8	15	0.43				
Mar 19/15	370			<1					6.73	29.8	20	0.5			78	
Mar 26/15					2.99	1180	<0.010		6.56	32.1	60	0.45				
Mar 31/15	88			<1				<10		33.1	20	0.63	2.36	4.27	75.6	
Apr 9/15								<10		33.2	10					
Apr 16/15	370			4						34.4	20	0.63			76	
Apr 23/15					3.64	1530	<0.010		6.69	45.8	20	0.58				
Apr 30/15	280			<1				16		24	10	0.68	2.25	3.12	77	
May 7/15								<10		30	15					
May 14/15	410			1						21.8	15	0.78			78.5	
May 21/14					4.16	2210	<0.010		6.85	20.7	10	0.79				
May 28/15	1900			<1				<10	6.69	27	30	1.28	3.51	3.47	71.3	
June 4/15								<10		27.1	15					
June 11/15	1200			1						24	15	1.33			73.3	
June 18/15					4.81	1430	<0.010		6.57	25.7	20	1.21				
June 25/15	1300			<1				26		17.5	20	1.06	2.89	2.08	76.3	
July 2/15										18	10					
July 16/15					4.42	1490	<0.010		6.76	16.7	15	0.39				
July 23/15	1000			1				14		12.7	10	0.59	2.66	2.7	83.9	
July 30/15								18		13.2	5					
Aug 5/15	2200			4						14.8	15	0.9			82.1	
Aug 13/15					4.16	1420	<0.010		6.95	7	10	0.8				
Aug 20/15	1800			<1				27		6	11	0.7	3.1	3.1	83.8	
Aug 27/15								<10		7	11					
Sept 3/15	1200			<1						6	15	0.8			84.6	
Sept 9/15					4.7	1290	<0.020		6.87	7	12	1.8				
Sept 17/15	440			2				<10		5	14	0.8	2.7	2.9	85.1	
Sept 23/15								19		10	20					
Oct 1/15	360			1						16	33	1.6			78.5	
Oct 8/15					5.22	1480	<0.020		6.91	14	22	1.7				
Oct 15/15	1000			4				15		17	30	3.1	2.36	3.84	77.7	
Oct 21/15										19	32	1.6				
Oct 29/15	540			2						21	37	2.9			73.4	
Nov 5/15					2.8	1720	0.011		6.5	27	35	1.7				
Nov 12/15	550			4				11		44.5	60	2	3.45	3.71	66.3	
Nov 19/15										29	35	2.2				
Nov 26/15	860			7						32	37	2			67	
Dec 3/15										50	58	2.4				420
Dec10/15	200			8				11		29	32	1.5	3.3	3.92	68.7	
Dec17/15					2.4	1450	<0.010		6.2	29	32	1.3				
	751.58	#DIV/0!	#DIV/0!	3.08	3.93	1520.00		20.17	6.70	22.63	22.17	1.17	2.83	3.23	77.46	420.00

Stocking Lake Lab Results, 2015

Date	Coliforms				Alkalinity	Calcium	Bromide	TDS	PH	Colour		Turbidity	DOC	TOC	UVT	THM
	total	fecal	non-coli	E-coli						TCU	ACU					
Jan 15/15	28			<1				28		14	14	0.5	3.16	3.14	81.3	
Jan 29/15	37			2	8.6	3550	<0.020		6.9	13	15	1.3				
Feb 5/15	11			<1				17		13	17	0.5	3.06		77.3	
Feb 12/15										11	15	0.4				
Feb 19/15	110			1						14	15	0.6			79.4	
Feb 26/15	29			<1				18		27.9	10	0.39	2.76	2.8	79.9	
Mar 5/15	35			<1				16	7.4	27.9	10	0.44	3.2	3.22	80.3	
Mar 12/15								28	7.41	20.4	10	0.42				
Mar 19/15	840			1					7.27	25.6	15	0.39			80.3	
Mar 26/15					9.63	3290	<0.010		7.14	25	30	0.33				
Apr 1/15	73			<1				<10		25.3	15	0.44	1.97	4.61	80.3	
Apr 9/15								18		25.3	5					
Apr 16/15	670			<1						26.4	15	0.44			80.5	
Apr 23/15					11.5	4600	<0.010		7.27	16	10	0.25				
Apr 30/15	220			<1				28		18.4	10	0.47	2.19	3.16	81.1	
May 7/15								18		15.6	5					
May 14/15	50			<1						17.2	10	0.51			82.2	
May 21/15					9.91	3160	<0.010		7.06	18.2	15	0.54				
May 28/15	70			1				14	7.3	16.3	5	0.51	2.41	1.97	82.4	
June 4/15								<10		17.7	5					
June 11/15	260			5						17.8	10	0.68			81.4	
June 18/15					9.82	3500	<0.010		7.2	14.9	10	0.57				
June 25/15	200			<1				22		12.6	5	0.55	2.61	1.21	83.4	
July 2/15								26		14.6	5					
July 23/15	2800			2		3660		28		13.5	10	0.68	1.97	1.22	84	
July 30/15								30		14.2	15					
August 5/15	9000			<1						12.1	10	0.8			84.8	
Aug 13/15					10.4	4050	<0.010		7.32	10	10	0.5				
Aug 20/15	>28000			4				33		7	12	0.4	2.4	2.9	85	
Aug 27/15								<10		8	10					
Sept 3/15				10						8	13	0.9			84	
Sept 9/15					10.8	3820	<0.020		7.28	7	10	0.7				
Sept 17/15	19000			<1				<10		6	13	0.6	2.8	2.8	84.8	
Sept 23/15								31		8	8					
Oct 1/15	5100			<1						8	12	0.9			84.4	
Oct 8/15					9.58		<0.020		7.09	7	9	0.6				
Oct 15/15	830			1				22		7	12	0.7	2.4	3.39	85.7	
Oct 21/15										6	10	0.8				
Oct 29/15	120			2						6	9	0.5			85.5	
Nov 5/15					8.9	3930	<0.010		6.9	8	9	0.5				
Nov 12/15	85			1				18		12	15	0.5	2.02	2.3	85	
Nov 19/15										10	11	0.8				
Nov 26/15	99			<1						10	10	0.5			84.1	
Dec 3/15										15	17	1.2				300
Dec 10/15	210			4				18		12	13	1	2.54	2.81	82.2	
Dec 17/15					8.7	3610	<0.010		6.8	15	12	0.5				

Chicken Ladder (Lower Holland Creek) Lab Results, 2015

Date	Coliforms				Alkalinity	Calcium	Bromide	TDS	PH	Colour			DOC	TOC	UVT	THM
	total	fecal	non-coli	E-coli						TCU	ACU	Turbidity				
Jan 15/15	68			1				22		19	20	0.1	2.94	2.91	80.4	
Jan 29/15	50			1	4.1	1820	<0.020		6.6	15	16	0.3				
Feb 5/15	680			18				13		21	23	3.7	2.92	3.19	81.1	
Feb 12/15										15	16	0.5				
Feb 19/15	36			1						16	17	0.3			78.8	
Feb 26/15	71			1				20		21.3	10	0.12	2.58	2.74	82.3	
Mar 5/15	73			<1				16	6.97	22.2	5	0.12	2.6	3.92	80.2	
Mar 12/15								44	7.11	34.3	15	0.36				
Mar 19/15	120			<1					7.06	28.2	15	0.15			77.1	
Mar 26/15					4.68	1600	<0.010		6.8	33.1	40	0.35				
Apr 1/15	110			1				<10		32.9	20	0.31	2.67	4.47	75	
Apr 9/15								10		24.2	5					
Apr 16/15	430			1						25.9	15	0.23			80.4	
Apr 23/15					5.91	2000	<0.010		7.06	18.6	10	0.15				
Apr 30/15	790			<1				20		21.4	5	0.33	1.7	2.84	80.5	
May 7/15								<10		18.3	10					
May 14/15	590			57						19	10	0.23			84.5	
May 21/15					7.14	2190	<0.010		7	18	10	0.18				
May 28/15	930			4				14	7.15	15.9	10	0.19	1.65	2.78	85.5	
June 4/15								<10		30.3	5					
June 11/15	1500			11						19.7	10	0.58			82	
June 18/15					6.19	2080	<0.010		7.02	19.4	10	0.65				
June 25/15	210			<1				28		18	15	0.55	2.12	0.69	82.4	
July 2/15								14		19.9	5					
July 16/15						1880	<0.010		7.03	18.3	20	0.16				
July 23/15	1600			38				20		15.2	10	0.18	1.51	1.33	86	
July 30/15								20		20.1	5					
August 5/15	720			14						14.6	10	0.3			86.8	
Aug 13/15					6.03	1990	<0.010		6.94	8	10	0.4				
Aug 20/15	950			2				26		8	10	0.2	1.9	2	88	
Aug 27/15								<10		8	10					
Sept 3/15	1300			34						9	10	0.2			87.1	
Sept 9/14					7.49	2110	<0.020		7.07	8	9	0.3				
Sept 17/15	3200			30				11		7	11	0.4	2.2	2.1	88	
Sept 23/15								18		9	7					
Oct 1/15	350			<1						8	8	0.2			88.2	
Oct 8/15					6.1	2380	<0.020		6.94	12	11	0.4				
Oct 15/15	800			1				22		17	15	0.6	2.13	4.52	77.8	
Oct 21/15										10	9	0.3				
Oct 29/15	840			8						30	35	0.5			60.5	
Nov 5/15					4.1	2310	<0.010		6.5	24	27	0.6				
Nov 12/15	300			13				23		44.7	20	0.4	3.22	3.73	65.6	
Nov 19/15										22	23	1.2				
Nov 26/15	140			1						19	15	0.3			75.4	
Dec 3/15										40	56.9	2.4				500
Dec 10/15	140			3				<10		21	19	1.6	3.55	3.73	71.3	
Dec17/15					3.7	1670	<0.010		6.4	19	13	0.4				

Source: <http://healthy Canadians.gc.ca/publications/healthy-living-vie-saine/water-haloacetic-haloacetique-eau/index-eng.php>

Guidelines for Canadian Drinking Water Quality: Guideline Technical Document - Haloacetic Acids (Executive Summary)

1.0 Guideline

The maximum acceptable concentration (MAC) for total haloacetic acids* in drinking water is 0.08 mg/L (80 µg/L) based on a locational running annual average of a minimum of quarterly samples taken in the distribution system.

Utilities should make every effort to maintain concentrations as low as reasonably achievable (or ALARA) without compromising the effectiveness of disinfection.

2.0 Executive summary

Haloacetic acids (HAAs) are a group of compounds that can form when the chlorine used to disinfect drinking water reacts with naturally occurring organic matter (e.g., decaying leaves and vegetation). The use of chlorine in the treatment of drinking water has virtually eliminated waterborne diseases, because chlorine can kill or inactivate most microorganisms commonly found in water. The majority of drinking water treatment plants in Canada use some form of chlorine to disinfect drinking water: to treat the water directly in the treatment plant and/or to maintain a chlorine residual in the distribution system to prevent bacterial regrowth. Disinfection is an essential component of public drinking water treatment; the health risks from disinfection by-products, including haloacetic acids, are much less than the risks from consuming water that has not been appropriately disinfected.

The haloacetic acids most commonly found in drinking water are monochloroacetic acid (MCA), dichloroacetic acid (DCA), trichloroacetic acid (TCA), monobromoacetic acid (MBA) and dibromoacetic acid (DBA). Of these, DCA and TCA have been most extensively studied, and there are some scientific data available on MCA and DBA. However, insufficient data were available to allow the development of an individual guideline for MBA.

This Guideline Technical Document reviews the health risks associated with haloacetic acids in drinking water. It assesses all identified health risks, taking into account new studies and approaches, as well as treatment considerations. Exposure to haloacetic acids from drinking water through inhalation and skin contact has been considered for inclusion, but is not deemed significant. Based on this

* *Total haloacetic acids refers to the total of monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid and dibromoacetic acid.*

review, the guideline for total haloacetic acids in drinking water is established at a maximum acceptable concentration of 0.08 mg/L. This guideline takes into consideration the availability of appropriate treatment technologies and the ability of treatment plants to meet the guideline without compromising the effectiveness of disinfection.

2.1 Health effects

The health effects associated with exposure to haloacetic acids will vary with the specific compound. MCA is considered unlikely to be carcinogenic to humans, based on the lack of evidence for carcinogenicity. Changes in body, liver, kidney and testes weights were observed in studies with rats. A health-based target concentration of 0.1 mg/L can be calculated for MCA in drinking water. DCA is considered to be a probable carcinogen to humans, based on sufficient evidence in animals and inadequate evidence in humans. Animal studies have shown links between exposure to DCA and liver tumours in both mice and rats. A health-based target concentration of 0.01 mg/L can be calculated for DCA in drinking water. TCA is considered to be a possible carcinogen in humans, based on limited evidence in experimental animals and inadequate evidence in humans. Animal studies have shown a link between exposure to TCA and liver tumours in mice only, but it is still uncertain whether the mechanism causing these tumours is relevant to humans. A health-based target concentration of 0.3 mg/L can be calculated for TCA in drinking water. MBA is unclassifiable with respect to carcinogenicity in humans, based on inadequate data from animal studies. DBA is considered to be probably carcinogenic in humans, based on sufficient evidence in animals and inadequate evidence in humans. Animal studies have shown links between exposure to DBA and tumours in several organs in both mice and rats. A health-based target concentration of 0.002 mg/L can be calculated for DBA in drinking water.

There is only one study currently available looking at the incidence or significance of health effects associated with human exposure to haloacetic acids. A small population-based study that was conducted in two eastern provinces did not find a link between exposure to haloacetic acids and risk of stillbirths. Other human studies on the incidence of cancer or reproductive effects have been conducted with chlorinated disinfection by-products, but not specifically with haloacetic acids.

Some animal studies suggest a possible link between developmental effects (heart defects) and exposure to DCA or TCA, whereas other studies fail to show a link. Animal studies also suggest a possible link between male reproductive effects (on sperm and sperm formation) and exposure to DCA or DBA, at levels significantly higher than those found in drinking water. Further studies are required to confirm these effects as well as their long-term significance to human health.

A single guideline for total haloacetic acids is established, based on the health effects of the individual haloacetic acids, and taking into consideration both treatment technology and the ability of treatment plants, particularly smaller ones, to achieve the guideline. The guideline is considered to be protective of health for all haloacetic acids, based on the ratio of haloacetic acids expected to be found in drinking water. The guideline value is primarily designed to be protective of the health effects of DCA, the

haloacetic acid that would pose the most significant health concerns and is found at the highest levels in drinking water.

2.2 Exposure

Levels of haloacetic acids are generally higher in treated surface water than in treated groundwater, because of the high organic content in lakes and rivers. Levels of haloacetic acids will be higher in warmer months, because of the higher concentrations of precursor organic materials in the raw water and especially because the rate of formation of disinfection by-products increases at higher temperatures. It should be noted that the presence of by-products such as MBA and DBA will also depend on the presence of bromine in the source water.

Available data suggest that drinking water may be a significant source of exposure to haloacetic acids, but there are few data available to determine the exposure from other media, such as food and air.

2.3 Treatment

Haloacetic acids and trihalomethanes are the two major groups of chlorinated disinfection by-products found in drinking water and generally at the highest levels. Together, these two groups can be used as indicators for the presence of all chlorinated disinfection by-products in drinking water supplies, and their control is expected to reduce the levels of all chlorinated disinfection by-products and the corresponding risks to health.

The approach to reduce exposure to haloacetic acids is generally focused on reducing the formation of chlorinated disinfection by-products. The concentrations of haloacetic acids and other chlorinated disinfection by-products in drinking water can be reduced at the treatment plant by removing the organic matter from the water before chlorine is added, by optimizing the disinfection process, by using alternative disinfection methods or by using a different water source. It is critical that any method used to control levels of haloacetic acids **must not** compromise the effectiveness of disinfection. The Federal-Provincial-Territorial Committee on Drinking Water also recommends that every effort be made not only to meet the guideline, but to maintain concentrations of haloacetic acids as low as reasonably achievable.

3.0 Application of the guideline

Note: Specific guidance related to the implementation of this guideline should be obtained from the appropriate drinking water authority in the affected jurisdiction.

The concentrations of haloacetic acids (HAAs) and trihalomethanes (THMs) can be used as indicators of the total loading of all chlorinated disinfection by-products (CDBPs) that may be found in drinking water supplies. The guideline for HAAs is also designed to take into consideration exposure and potential health effects related to other CDBPs, on which very little is known. The guideline is measured as a locational running annual average of quarterly samples, because HAA levels can vary significantly over time, including seasonally, with factors such as the levels of organic matter in the raw water and temperature.

Given the limited information on the risks and uncertainties associated with other CDBPs, it is recommended that treatment plants strive to maintain HAA levels as low as reasonably achievable (ALARA) without compromising disinfection. This should also be considered when changes, upgrades or expansions are made to the treatment plants or distribution systems. Any effort aimed at reducing disinfection by-products, such as changing disinfection strategies, needs to be considered in light of changes in water quality that may inadvertently increase the levels or leaching of other contaminants, such as lead, in the distributed water.

[Table 1](#) lists the estimated lifetime (70 years) risk of excess liver cancer (in addition to the background lifetime cancer risk) associated with the ingestion of HAAs in drinking water at various concentrations, based on animal studies. It is expressed as a range, which represents estimated proportions of 40-60% of DCA in total HAAs.

Table 1:	
Estimated lifetime range of risk of excess liver cancer (in addition to the background lifetime cancer risk) from exposure to DCA associated with various concentrations of HAAs in drinking water	
Levels of HAAs in drinking water (µg/L)	Estimated lifetime range of risk of excess cancers (×10 ⁻⁵)*
40	1.6-2.4
60	2.4-3.6
80	3.2-4.8
100	4.0-6.0
120	4.8-7.2
<p>Table 1 Footnote *</p> <p>The estimated lifetime range of risk of excess cancers above background levels is calculated from the risk associated with ingesting DCA at a concentration of 1 µg/L in drinking water, assuming a proportion of 40-60% of DCA in total HAAs.</p>	

3.1 Monitoring

At a minimum, quarterly monitoring of treated water from surface water and groundwater sources is recommended for total HAAs. Increased frequency of monitoring may be required for facilities using surface water sources Footnote* during periods when water characteristics are more favourable to the formation of by-products, which will vary according to the specific system. Since total HAA concentrations vary within and between distribution systems, depending on different factors, including water quality characteristics (e.g., HAA precursors, pH, season, temperature) and treatment conditions (e.g., disinfectant type, disinfectant dose, contact time), it is recommended that monitoring samples be taken at the water treatment plant and at points in the distribution system where historical data show the highest HAA concentrations.

Where historical data are not available, program should be put in place to monitor HAA levels in the middle and extremities of the distribution system. Areas with extremely low or no disinfectant residual should be avoided, but areas where disinfectant residuals are significantly lower than the system

average because of a long residence time (e.g., dead ends, low flow areas) should be targeted. In systems with booster chlorination stations and water tanks or reservoirs, it is expected that higher HAA concentrations would be found downstream of these components.

Monitoring/reporting may be reduced if drinking water monitoring does not show elevated levels of disinfection by-products within the distribution system.

(See website for Part Two of this document)

Appendix E – Ministry of Health – Microbiological Results, 2015

The following pages provide the Ministry of health Microbiological Sampling for The Town’s distribution system for 2015.

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
1280 Rocky Creek Road, 1280 Rocky Creek Road	16-Dec-2015	L1	L1
558 Hooper Place, 558 Hooper Place	16-Dec-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	16-Dec-2015	L1	L1
Public Works Yard, 340 6th Avenue	16-Dec-2015	L1	L1
405 Blair Place, 405 Blair Place	8-Dec-2015	L1	L1
604 Farrell Road, 604 Farrell Road	8-Dec-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive,	8-Dec-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	8-Dec-2015	L1	L1
432 Davis Road, 432 Davis Road	2-Dec-2015	L1	L1
City Hall, 410 Esplanade	2-Dec-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	24-Nov-2015	L1	L1
558 Hooper Place, 558 Hooper Place	24-Nov-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	24-Nov-2015	L1	L1
405 Blair Place, 405 Blair Place	18-Nov-2015	L1	L1
Public Works Yard, 340 6th Avenue	18-Nov-2015	L1	L1
AUDIT- Town of Ladysmith, any available source	16-Nov-2015	L1	L1
604 Farrell Road, 604 Farrell Road	9-Nov-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	9-Nov-2015	L1	L1
432 Davis Road, 432 Davis Road	5-Nov-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	4-Nov-2015	L1	L1
City Hall, 410 Esplanade	4-Nov-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	27-Oct-2015	1	L1
558 Hooper Place, 558 Hooper Place	27-Oct-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	27-Oct-2015	L1	L1
405 Blair Place, 405 Blair Place	20-Oct-2015	L1	L1
Public Works Yard, 340 6th Avenue	20-Oct-2015	L1	L1
604 Farrell Road, 604 Farrell Road	14-Oct-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	14-Oct-2015	L1	L1
City Hall, 410 Esplanade	14-Oct-2015	L1	L1
432 Davis Road, 432 Davis Road	6-Oct-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	6-Oct-2015	L1	L1

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
1280 Rocky Creek Road, 1280 Rocky Creek Road	29-Sep-2015	L1	L1
558 Hooper Place, 558 Hooper Place	29-Sep-2015	L1	L1
604 Farrell Road, 604 Farrell Road	22-Sep-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	22-Sep-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	15-Sep-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	15-Sep-2015	L1	L1
432 Davis Road, 432 Davis Road	8-Sep-2015	L1	L1
Public Works Yard, 340 6th Avenue	8-Sep-2015	L1	L1
405 Blair Place, 405 Blair Place	1-Sep-2015	L1	L1
City Hall, 410 Esplanade	1-Sep-2015	L1	L1
432 Davis Road, 432 Davis Road	26-Aug-2015	L1	L1
604 Farrell Road, 604 Farrell Road	26-Aug-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	26-Aug-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	19-Aug-2015	L1	L1
558 Hooper Place, 558 Hooper Place	19-Aug-2015	L1	L1
City Hall, 410 Esplanade	19-Aug-2015	L1	L1
405 Blair Place, 405 Blair Place	11-Aug-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	11-Aug-2015	L1	L1
Public Works Yard, 340 6th Avenue	4-Aug-2015	1	L1
Wastewater Treatment Plant, Oyster Cove Road	4-Aug-2015	L1	L1
604 Farrell Road, 604 Farrell Road	28-Jul-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	28-Jul-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	28-Jul-2015	L1	L1
405 Blair Place, 405 Blair Place	20-Jul-2015	L1	L1
City Hall, 410 Esplanade	20-Jul-2015	L1	L1
Public Works Yard, 340 6th Avenue	20-Jul-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	15-Jul-2015	L1	L1
558 Hooper Place, 558 Hooper Place	15-Jul-2015	L1	L1
432 Davis Road, 432 Davis Road	7-Jul-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	7-Jul-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	29-Jun-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	24-Jun-2015	L1	L1
558 Hooper Place, 558 Hooper Place	24-Jun-2015	L1	L1
432 Davis Road, 432 Davis Road	16-Jun-2015	L1	L1

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
606 Oakwood Road, 606 Oakwood Road	16-Jun-2015	L1	L1
City Hall, 410 Esplanade	16-Jun-2015	L1	L1
405 Blair Place, 405 Blair Place	9-Jun-2015	L1	L1
Public Works Yard, 340 6th Avenue	9-Jun-2015	L1	L1
604 Farrell Road, 604 Farrell Road	3-Jun-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	3-Jun-2015	L1	L1
604 Farrell Road, 604 Farrell Road	26-May-2015	L1	L1
City Hall, 410 Esplanade	26-May-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	26-May-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	19-May-2015	L1	L1
558 Hooper Place, 558 Hooper Place	19-May-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	19-May-2015	L1	L1
405 Blair Place, 405 Blair Place	12-May-2015	L1	L1
Public Works Yard, 340 6th Avenue	12-May-2015	L1	L1
432 Davis Road, 432 Davis Road	5-May-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	5-May-2015	L1	L1
432 Davis Road, 432 Davis Road	27-Apr-2015	L1	L1
558 Hooper Place, 558 Hooper Place	27-Apr-2015	L1	L1
Public Works Yard, 340 6th Avenue	27-Apr-2015	L1	L1
405 Blair Place, 405 Blair Place	22-Apr-2015	L1	L1
City Hall, 410 Esplanade	21-Apr-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	14-Apr-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	14-Apr-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	8-Apr-2015	L1	L1
604 Farrell Road, 604 Farrell Road	8-Apr-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive, Ladysmith	8-Apr-2015	L1	L1
405 Blair Place, 405 Blair Place	23-Mar-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	23-Mar-2015	L1	L1
604 Farrell Road, 604 Farrell Road	17-Mar-2015	L1	L1
City Hall, 410 Esplanade	17-Mar-2015	L1	L1
Public Works Yard, 340 6th Avenue	17-Mar-2015	L1	L1
432 Davis Road, 432 Davis Road	10-Mar-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	10-Mar-2015	L1	L1

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
1280 Rocky Creek Road, 1280 Rocky Creek Road	2-Mar-2015	L1	L1
558 Hooper Place, 558 Hooper Place	2-Mar-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	2-Mar-2015	L1	L1
405 Blair Place, 405 Blair Place	23-Feb-2015	L1	L1
City Hall, 410 Esplanade	23-Feb-2015	L1	L1
432 Davis Road, 432 Davis Road	17-Feb-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	17-Feb-2015	L1	L1
Public Works Yard, 340 6th Avenue	17-Feb-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	10-Feb-2015	L1	L1
558 Hooper Place, 558 Hooper Place	10-Feb-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	10-Feb-2015	L1	L1
604 Farrell Road, 604 Farrell Road	3-Feb-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	3-Feb-2015	L1	L1
604 Farrell Road, 604 Farrell Road	27-Jan-2015	L1	L1
City Hall, 410 Esplanade	27-Jan-2015	L1	L1
405 Blair Place, 405 Blair Place	20-Jan-2015	L1	L1
606 Oakwood Road, 606 Oakwood Road	20-Jan-2015	L1	L1
Wastewater Treatment Plant, Oyster Cove Road	20-Jan-2015	L1	L1
1280 Rocky Creek Road, 1280 Rocky Creek Road	13-Jan-2015	L1	L1
558 Hooper Place, 558 Hooper Place	13-Jan-2015	L1	L1
Public Works Yard, 340 6th Avenue	13-Jan-2015	L1	L1
432 Davis Road, 432 Davis Road	7-Jan-2015	L1	L1
Kinsmen Park , 1000 Colonia Drive	7-Jan-2015	L1	L1

Appendix E - Permit To Operate



HEALTH PROTECTION

PERMIT to OPERATE

A WATER SUPPLY SYSTEM

Water System Name: **TOWN OF LADYSMITH WATER WORKS**
Premises Number: 1310824
Premises Address: 330 6th Avenue
Ladysmith, BC
V0R 2E0
Water System Owner: Town Of Ladysmith

Town Of Ladysmith is hereby permitted to operate the above potable water supply system and is required to operate this system in accordance with the Drinking Water Protection Act and in accordance with the conditions set out in this operating permit and conditions established as part of any construction permit.

The water supply system for which this operating permit applies is generally described as:

Service Delivery Area: Town of Ladysmith and Diamond Improvement District
Source Water: Banon Creek, Stocking Lake, Holland Lake, Chicken Ladder Dam
Water Treatment methods are: None
Water Disinfection methods are: Chlorine
Number of Connections 301-10,000 Connections - DWT

Operating conditions specific to this water supply system are in Appendix A.

Date: February 14, 2011

Issued By: 
Environmental Health Officer

**This permit must be displayed
in a conspicuous place and is not transferable**

Place Decal Here



APPENDIX A
WATER SYSTEM OPERATING CONDITIONS FOR
TOWN OF LADYSMITH WATER WORKS
330 6th Avenue
Ladysmith, BC, V0R 2E0

Compliance with these Operating Permit Terms and Conditions do not relieve the operator of other legislated responsibilities and obligations.

The specific items and conditions of this operating permit are listed below as:

1. Existing Performance Standards

The Water System Owner (Town of Ladysmith) shall ensure the disinfection system is in good working order and provide the following:

- a 4-log inactivation of viruses, and
- raw water turbidity must be recorded on a continuous basis and shall not exceed 1 NTU in more than 5% of the average daily measurements in each calendar month. If the raw water exceeds an average of 5 NTU for a period of more than 12 hours, the Drinking Water Officer must be contacted immediately.

2. Future Treatment Specifications

On or before January 31, 2018, the Water System Owner shall provide two treatment processes acceptable to Island Health (Vancouver Island Health Authority), to achieve a 4-log removal/inactivation of viruses; a 3-log removal/inactivation of Giardia cysts and Cryptosporidium oocysts and produce finished water with less than 1 NTU turbidity.

The Water System Owner is required to meet the following implementation plan dates:

A. Pilot Testing Program and Selection of Treatment Process

By March 31, 2015 a final treatment process shall be determined and submitted to our office.

B. Final Selection of the Filtration Plant

By May 31, 2016, the filtration process selected is to be completed.

C. Completion of the Filtration Plant Project

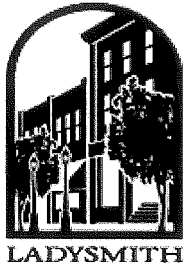
By January 31, 2018, the construction of the Filtration Plant is to be completed and in operation.

Date: July 7, 2014


Environmental Health Officer

Health Protection & Environmental Services
3rd Floor – 6475 Metral Drive
Nanaimo BC V9T 2L9

Tel: 250-755-6215 | Fax: 250-755-3372
viha.ca



Town of Ladysmith

STAFF REPORT

To: Ruth Malli, City Manager
From: Felicity Adams, Director of Development Services
Date: March 14, 2016
File No: 3360-15-04

RE: Zoning Bylaw Housekeeping Amendments – Bylaw No. 1904

RECOMMENDATION(S):

That under the Bylaw's portion of tonight's agenda, Council proceed with the first two readings of "Town of Ladysmith Zoning Bylaw 2014, No.1860 Amendment Bylaw (No.4), 2016, No. 1904" and refer the Bylaw to Public Hearing.

PURPOSE:

The purpose of this report is to present a housekeeping bylaw to amend the Zoning Bylaw.

INTRODUCTION/BACKGROUND:

A new Zoning Bylaw was adopted for the Town of Ladysmith in August 2014. Due to the complexity of Zoning Bylaw drafting it is typical for a new Zoning Bylaw to require housekeeping amendments after the bylaw is in use.

At the Council meeting on October 13, 2015 staff was directed to:

1. Prepare a housekeeping bylaw to amend Town of Ladysmith Zoning Bylaw 2014, No. 1860 as outlined in the staff report from the Director of Development Services dated October 6, 2015.
2. Refer the Category One amendments to the Advisory Planning Commission for review and comment.

A housekeeping bylaw has been prepared for Council review, "Town of Ladysmith Zoning Bylaw 2014, No.1860 Amendment Bylaw (No.4), 2016, No. 1904" and is included in the Bylaw portion of the Council agenda. Also, the applicable amendments were referred to the Advisory Planning Commission (APC) for review and comment at their October 15, 2015 meeting, and their motions and comments are provided in this staff report.

SCOPE OF WORK:

The current stage is that the housekeeping bylaw has been drafted based on Council direction. Five new housekeeping items have been identified since Council's earlier direction, which are included in the housekeeping bylaw. Two items are in response to industry requests: improving heat pump location requirements and permitting barbed wire fencing in the light industrial and industrial zone. Three items are staff suggested minor alterations: adding finished floor area requirements in two zones, revising the definition of civic use, and adding a definition of public works yard. The following is a summary of the housekeeping amendment bylaw, "Town of Ladysmith Zoning Bylaw 2014, No.1860 Amendment Bylaw (No.4), 2016, No. 1904".

Summary of Housekeeping Bylaw No. 1904

Part 4: Definitions

- A revised definition of 'Civic Use' is proposed. The new definition includes a public works yard and public utility use.
- An updated definition of 'Funeral Home' is proposed, to reflect all types of end of life processes.
- An improved definition of 'Moorage' is proposed, to include 'Personal Watercraft'.
- A revised definition of 'Public Utility Use' is proposed to include 'composting of municipal generated bio-solids'.
- A definition of 'Public Works Yard' is added.
- A definition of 'Streamside Protection and Enhancement Area' (SPEA) is added.

Part 5: General Regulations

- Section 5.6: The heat pump regulation is improved by allowing heat pumps in side yards which is the typical location for a heat pump.
- Section 5.9: The accessory building regulations are improved by stating clearly that accessory buildings may not contain 'Kitchen Facilities' (unless it is a legal coach house dwelling).
- Section 5.20: The fence regulations are improved by clarifying the regulations for a pergola, trellis, gate, or similar structure; and by limiting the height of masonry style walls in the commercial zones and R-2-LW zone.

Part 6: Specific Use Regulations

- Section 6.3: The 'Uses Prohibited In All Zones' is amended to permit a composting facility which handles municipal generated bio-solids.
- Section 6.5: The coach house regulations are amended by allowing a coach house entry to front onto a lane or exterior side parcel line; and by adding a maximum size of 2.9m² for upper level coach house balconies or decks.
- Section 6.8: The home based business size regulations are re-formatted as a table for clarity.
- Section 6.9: The cottage industry regulations are amended by adding a maximum gross floor area of 100m² for a cottage industry in the R-2-LW zone.

Part 7: Landscaping and Screening Regulations

- Section 7.1: A clause is added to permit barbed wire fencing in an industrial zone for security purposes, as this is a common practice in Ladysmith's industrial areas.
- Section 7.2: A clarification is added to ensure shade trees are placed within a parking area and not at the edges to maximize the purpose of a shade tree.

Part 8: Parking and Loading Regulations

- Table 8.1 is amended by adding the clause “plus 1 per employee” to the Residential Community Care Facility parking requirements; and the term ‘funeral parlour’ is replaced with the updated term ‘funeral home’.

Part 10: Residential Zones

- The clarity of the interior and exterior side parcel line setbacks is improved to ensure that exterior side yards have the greater setback in several of the zones.
- To acknowledge and legalize an existing situation, site specific regulations are added to the ‘Single Dwelling Residential’ (R-1) zone to permit a two unit dwelling on the following properties: 521/525 Walkem Road, 517/519 Short Close, and 521/523 Short Close. A letter has been sent to these property owners to advise them of the proposed amendment to legalize duplex buildings on their properties.
- A clause is added to the R-1-A, R-1-B, and R-1-C zone stating that a Streamside Protection and Enhancement Area cannot be within the minimum parcel area when new lots are created.
- Clarification is provided in the Old Town Residential (R-2) zone, stating that a High Street Intensive Residential Development Permit is needed prior to construction of a dwelling unit on parcels that are 277m² in size.
- Finished floor area minimum and maximums are added to the R-2-A zone and R-2-LW zone to be consistent with the other residential zones.
- The R-3-A zone is amended such that the rear parcel line setback is 4.5 metres.

Part 11: Commercial Zones

- The clarity of the interior and exterior side parcel line setbacks is improved to ensure that exterior side yards have the greater setback.
- The Downtown Commercial (C-2) zone is amended by deleting funeral parlor as a permitted use; adding funeral home as a site specific permitted use at 112 French Street); and stating that coffee roasting is not a permitted cottage industry.
- The Highway Service Commercial (C-3) zone is amended such that the maximum permitted height for principal buildings is 6 metres.

Part 12: Industrial Zones

- The Light Industrial (I-1) zone is amended by deleting ‘food truck’ as a principal use, as it is already permitted as an accessory use in the zone.

Part 13: Institutional Zones

- The Park and Recreation (P-2) zone is amended by adding urban agriculture (and keeping of honey bees, max. 2 hives) as a permitted use in the community garden.

Part 14: Agriculture Zones

- The Primary Agriculture (A-1) and Agriculture and Resort Recreation (A-RR) zones are amended to accommodate the Minister's Guidelines for medical marihuana growing and production use on agriculture land reserve (ALR) lands.

Part 17: Comprehensive Development Zones

- The Comprehensive Development 3 – Malone Residential (CD-3) is amended by improving the clarity of the interior and exterior side parcel line setbacks to ensure that exterior side yards have the greater setback.
- The Comprehensive Development 4 – Waterfront Reserve Zone (CD-4) is amended by clarifying the exterior parcel line setback.

Zoning Bylaw Map

- The Zoning Bylaw map is amended by placing the R-3-A zone on a portion of the property at 100 Gifford Road, as this portion was missed on the map when the August 2014 Zoning Bylaw was adopted. Letters have been sent to the affected property owners so that they are aware of the proposed map correction.
- Incorrect street addresses will also be fixed on the Zoning Bylaw map.

ALTERNATIVES:

To not proceed with first and second reading of 'Town of Ladysmith Zoning Bylaw 2014, No.1860 Amendment Bylaw (No.4), 2016, No. 1904' and to not proceed with a public hearing.

FINANCIAL IMPLICATIONS:

As this is a Town-initiated bylaw, there will be costs associated with the Public Notice.

LEGAL IMPLICATIONS:

A public hearing is required to be held.

CITIZEN/PUBLIC RELATIONS IMPLICATIONS:

Public notification in a local newspaper would be required prior to a public hearing.

The proposed housekeeping amendments were referred to the Advisory Planning Commission (APC) at their meeting on October 15, 2015. The APC offers the following motions and comments:

- 1) The APC recommends not permitting the 'funeral parlour' use outright in the C-2 Zone and recommends updating the 'funeral parlour' term and definition.
- 2) The APC recommends support for permitting two bee hives in the community garden at the corner of Second Street and High Street.
- 3) The APC recommends support for limiting the height of solid masonry walls to 0.8 metres.
- 4) The APC thought perhaps the topic of medical marihuana was an evolving topic in Canada and that it may be too soon to amend the Zoning Bylaw (to meet BC Minister Bylaw standards) as federal and provincial recommendations may change.

Quorum was lost late in the meeting as one member had to leave, thus the following recommendations are not in the form of a motion.

- 1) The APC supports amending the small lot zones (R-1-A, R-1-B, and R-1-C) such that no parcel created by subdivision may contain a Streamside Protection and Enhancement Area.
- 2) The APC supports amending the coach house regulations to allow a coach house entry door to be on the lane or exterior side yard.
- 3) The APC had mixed comments regarding reducing the size of second storey balconies for coach homes from 7.5m². The range of comments were: “do not allow second storey balconies on coach homes”, “yes, reduce the permitted size of second storey balconies on coach homes” and “no do not reduce the permitted size of second storey balconies on coach homes”.
- 4) The APC supports the objective of distinguishing between accessory buildings and coach houses, but does not support clarifying what plumbing features are permitted in an accessory building as the means to define a coach home versus an accessory building.

INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS:

The proposed Bylaw No. 1904 was referred to the Building Inspector and Infrastructure Services Department for review. Their input has been incorporated into the proposed bylaw.

RESOURCE IMPLICATIONS:

The zoning housekeeping bylaw project is within current staff resources.

ALIGNMENT WITH SUSTAINABILITY VISIONING REPORT:

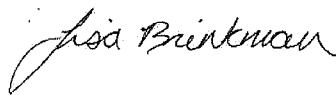
The recommended housekeeping improvements are consistent with the Visioning Report.

ALIGNMENT WITH STRATEGIC PRIORITIES:

Effective land use planning and community design is a strategic Council direction.

SUMMARY:

It is recommended to proceed with the first two readings of “Town of Ladysmith Zoning Bylaw 2014, No.1860 Amendment Bylaw (No.4), 2016, No. 1904” and proceed to public hearing.



Report Author: Lisa Brinkman, Senior Planner

I concur with the recommendation:



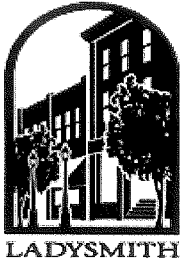
Felicity Adams, Director of Development Services



Ruth Malli, City Manager

ATTACHMENT:

Bylaw No. 1904



Town of Ladysmith
STAFF REPORT

To: Ruth Malli, City Manager
From: Clayton Postings, Director of Parks, Recreation and Culture
Date: February 26, 2016
File No:

Re: ADDITIONAL AGGIE HALL AREA PARKING

RECOMMENDATION(S):

That Council:

1. Direct staff to commence discussions with the owners of 125 Symonds Street to lease the property for parking, and to report back to Council on lease and funding options;
2. Include in the 2016-2020 financial plan \$5,000 toward parking and traffic signage improvements in the Aggie Hall area, with funding to come from Gas Tax Funds.

PURPOSE:

Currently there is limited parking at Aggie Hall and the surrounding area for special events and major functions. This report is to provide Council with recommendations on expanding the parking availability around Aggie Hall.

INTRODUCTION/BACKGROUND:

Events at Aggie Hall put demand on parking in the surrounding area. Business owners in the area have indicated that Aggie Hall parking issues have negatively affected their businesses and that their customers and employees are not able to access their businesses due to Aggie Hall users occupying parking spaces in their parking lots.

Town staff have worked with the surrounding residents, businesses as well as Aggie Hall users to ensure Aggie Hall patrons are aware of the parking restrictions in the area. However, even with this regular monitoring and communication further solutions are required to manage this ongoing challenge.

At the October 13th, 2015 Council meeting, Council made the following resolutions:

1. *Direct staff to begin consultation with the neighbourhood surrounding Aggie Hall relating to proposed parking improvements and report back to Council.*
2. *Direct staff to investigate the costs associated with expanding parking on Second Avenue in accordance with the parking concept drawings contained in the staff report from the Director of Parks, Recreation and Culture dated September 30, 2015.*
3. *Direct staff to continue discussions with the property owner of 125 Symonds Street regarding the possibility of leasing the property for public parking.*

Neighbourhood Consultation:

A total of 14 properties in the neighbourhood were provided a letter which outlined the proposed improvements/changes to the parking on Second Avenue. The letter included a diagram of the proposed changes and some key considerations. The Town of Ladysmith received a response back from seven residents and two onsite visits were requested and provided by Town staff. In general the response was favourable to improving the areas parking as each response noted that there are issues with parking during events and usage of the Aggie Hall/sports field facilities. Some of the main comments relating to the concept included:

- Assists with accessing property driveways
- Provides specified parking stalls, rather than people creating their own parking.
- Recommend increased signage relating to parking
- Consider greenspace and trees as it relates to parking expansion
- Possible phase in of parking plan, as it is costly to add the defined parking
- Proposed changes seemed expensive for number of parking stalls to be added

The feedback supported improving the parking in the area, and the proposal to expand parking on the North/East side of the road was favourable, however it was suggested possible signage in the area especially on the South/West side might be an appropriate first step. Also the South/West side of the road has a number of questions relating to underground services gas lines, sanitary, which need to be considered and may become costly.

Project Costing:

Engineering consultants provided cost estimates based on the concept drawings. The estimates for the original concept on Second Ave. was approximately \$101,000, this estimate did not include civic engineering or the addition of a gravel pathway from Second Ave. down to Aggie Hall which is estimated at approximately \$15,000. Total project cost \$116,000.

The consultant has provided an updated cost estimate based option of only expanding the parking on just the North/East side of Second Ave. The revised cost is \$62,000, the civil engineering, geotechnical expected to be approximately \$15,000 while the addition of the pathway and signage is approximately \$4,000. Total project cost \$80,000.

Leasing Additional Parking:

The owner of 125 Symonds Street indicated the possibility of the Town leasing their property for public parking purposes. This proposal would be similar to that which is in place in a number of parking lots around Town where the Town leases the land for public parking. The property owner has provided a proposal for this option, which would increase parking in the area by 20-26 parking stalls, this proposal also reduces the ongoing conflict of Aggie Hall users accessing the 49th Parallel Parking lot during events. The proposed cost to lease the parking spaces is \$600 to \$780 per month.

In consideration of improving parking around Aggie Hall, it is recommended that the best options would be to improve parking on Second Avenue by installing parking signage in the area, along with leasing additional parking spots at 125 Symonds Street. The combination of these options

will increase available parking in the area and would likely satisfy the surrounding residents, business owners and users of the facilities.

In review of the cost of expanding parking on 2nd Avenue the cost per parking stall is fairly high, when considering the project cost versus number of stalls to be added.

SCOPE OF WORK:

Town staff would begin planning parking signage improvements around Aggie Hall.

Staff will commence discussions with 125 Symonds Street regarding leasing the property for public parking, and will provide Council a report on lease and finance options.

ALTERNATIVES:

1. Proceed with parking improvements on the North/East side of 2nd Avenue.
2. Council direct staff to investigate expanding Aggie Hall parking on the Aggie Hall property and prepare options, and costs relating to this site.
3. Not to proceed with any changes relating to the parking surrounding Aggie Hall.

FINANCIAL IMPLICATIONS:

As part of the 2016-2020 financial plan a parking lot development for Aggie was identified, with \$80,000 allocated in 2016 for Second Ave. parking improvements. The funding for this project was proposed to come from taxation and Gas Tax.

In regards to the leasing of parking at 125 Symonds St., this is currently not budgeted for and would be an annual operational expense, ineligible for Gas Tax Funding. The annual estimate would be between \$7,200 and \$9,360. The property owner has requested a tax exemption for this property which would be a further increase in taxation to make-up the lost taxation revenue from this particular property. The earliest the tax exemption could take effect is for the taxation year 2017.

With the addition of available parking, it is estimated that Aggie Hall bookings could increase. Adding a parking fee for Aggie Hall facility bookings, or a combination of a fee increase and budgeting for the parking lot lease could make up some revenue to offset the lease expense.

The current budget for Aggie is:

Rental Revenue	\$ 6,000
Hall Expenses	45,026

LEGAL IMPLICATIONS:

In relation to expanding parking on Second Ave, no legal implications have been identified.

In regards to 125 Symonds Street a partnering agreement will have to be prepared if the site is to be used for Town parking in the future and a Permissive Tax Exemption granted.

CITIZEN/PUBLIC RELATIONS IMPLICATIONS:

It is anticipated that enhancing Aggie Hall parking will increase accessibility for the community for major events and regular usage of the Hall. Tenants and users of the site have indicated that additional parking would be a benefit for all users of the facility and for the businesses in the surrounding area.

Neighbourhood consultation has been completed and feedback has been received and considered.

INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS:

This initiative will include the Public Works Department as it relates to any construction or development of the roadway.

RESOURCE IMPLICATIONS:

None at this time until a site is selected.

ALIGNMENT WITH SUSTAINABILITY VISIONING REPORT:

This initiative aligns with Strategy 7 – A Healthy Community: Continuing to enhance the quality of the public realm; increasing community facilities including health and medical facilities

ALIGNMENT WITH STRATEGIC PRIORITIES:

This project aligns with Council Strategic Priorities relating to Natural and Built Infrastructure.

SUMMARY:

Over the years many events, both large and small, have put increased demands on the parking around Aggie Hall. Business owners in the area have indicated that this parking issue has negatively impacted their businesses and that their customers are not able to access their businesses due to Aggie Hall users parking in the businesses' parking lots.

Expansion of existing parking around Aggie Hall and increasing signage in the area will improve the parking for the entire area.

I concur with the recommendation.



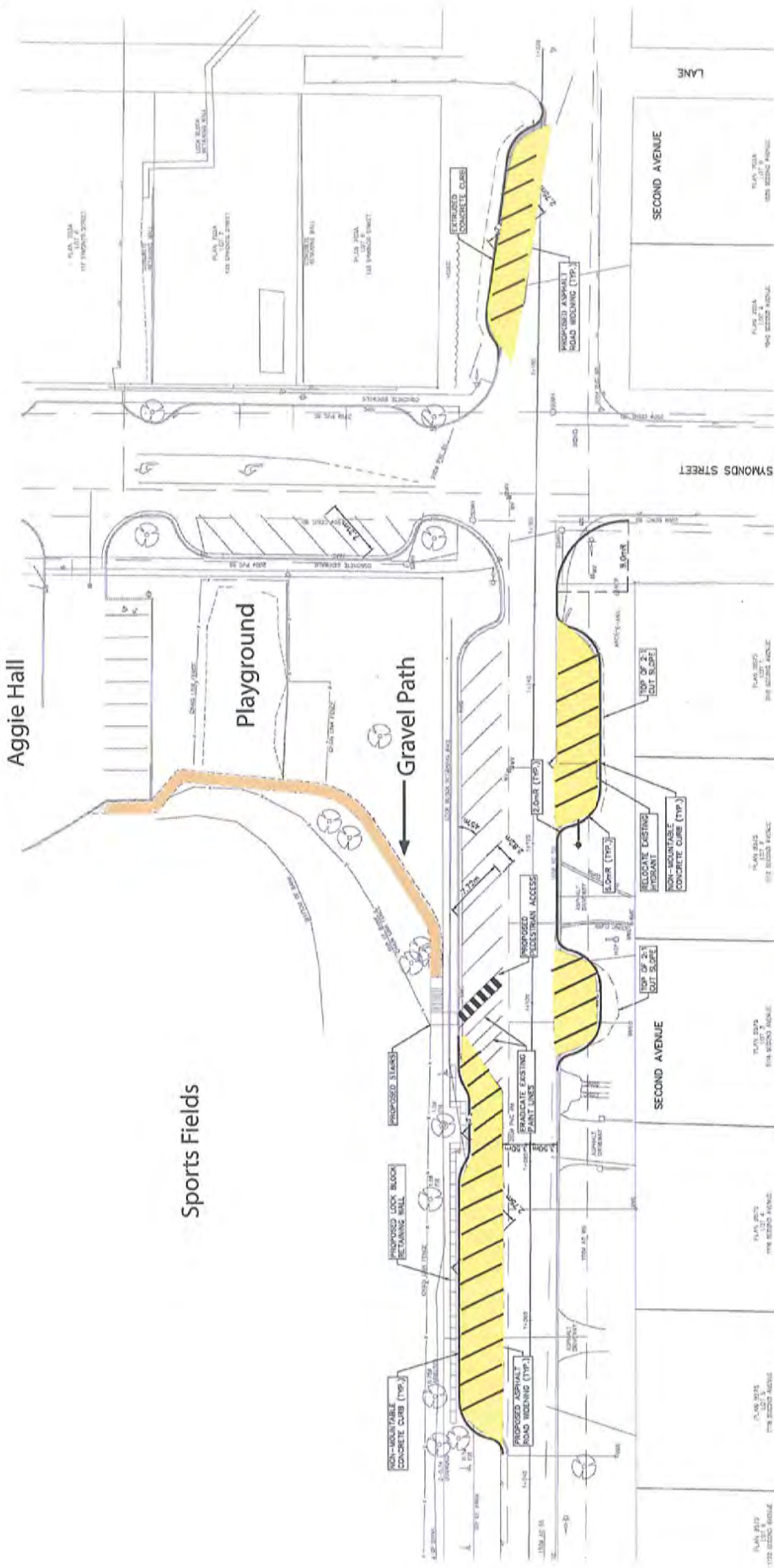
Ruth Malli, City Manager

ATTACHMENTS:

Appendix A: Original Second Ave. Parking Improvements Concept Drawings

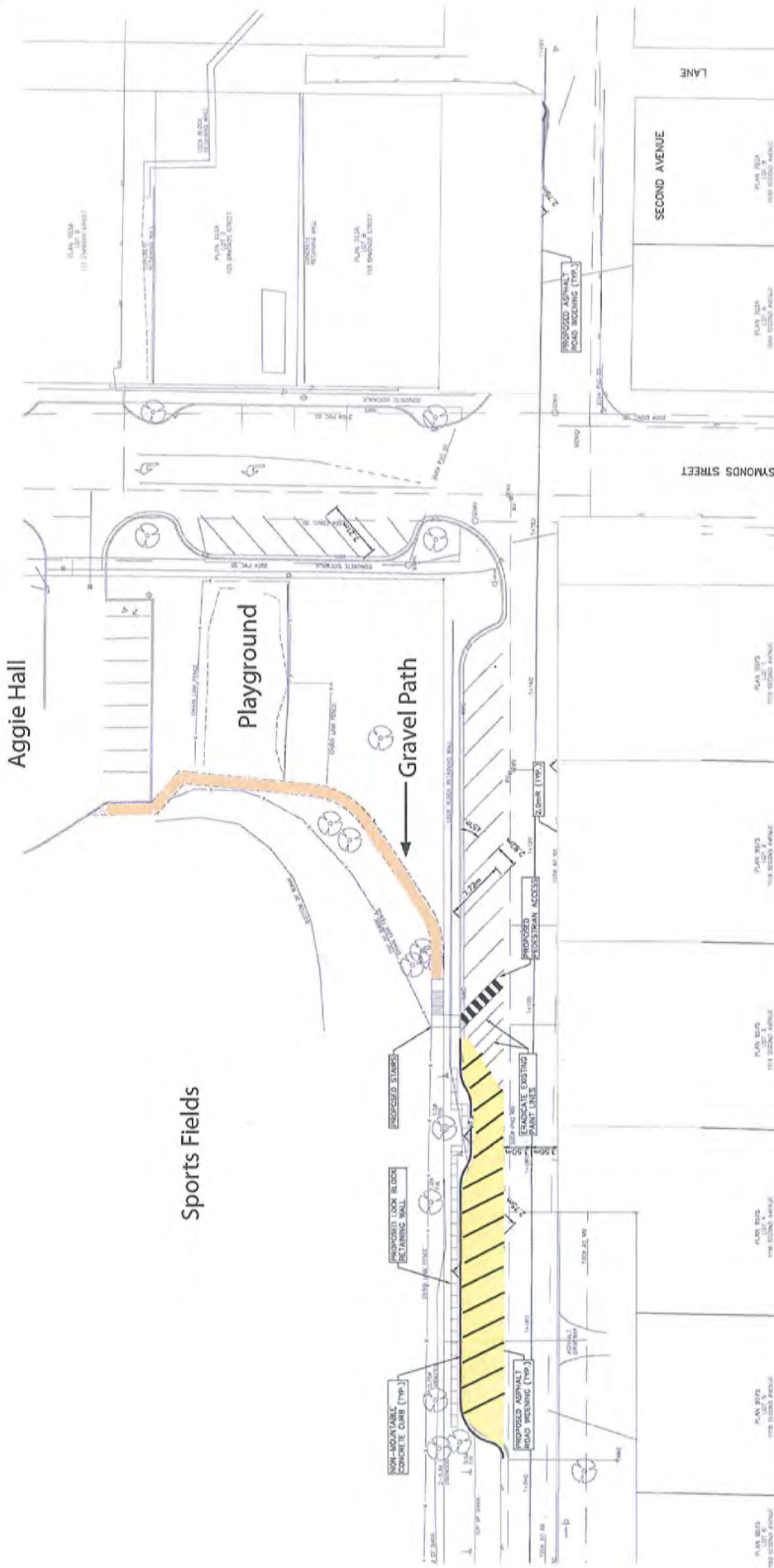
Appendix B: Revised Second Ave. Parking improvements

Appendix C: Letter from 125 Symonds property owner



Concept presented to neighbours

Yellow indicates new parking stalls
 Orange indicates new gravel pathway



Yellow indicates new parking stalls
 Orange indicates new gravel pathway



49th Parallel **GROCERY**

Ladysmith Store #1

Head Office

1020 1st Avenue, P.O. Box 687

Ladysmith, B.C. V9G 1A5

Ph. # (250) 245-3221

Fax # (250) 245-3498

E-mail: info@the49th.com

February 18, 2016

Mayor and Council
Town of Ladysmith

Re: PROPOSAL – AGGIE HALL PARKING

As you know, parking at our site during events or other special activities at Aggie Hall continue to put undue stress on our business. We are pleased to see some progress in plans for increased parking along Second Avenue, however we feel your project will not completely resolve the problem.

We would like to offer the following proposal to complement your plans:

- We will remove the house at 125 Symonds Street.
- We will grade, curb and gravel the property in order to provide approximately 20 – 26 additional parking spaces with access from our existing parking lot and Warren Street.
- This parking will be designed for Aggie Hall users, visitors and customers alike.
- The parking will not be used by 49th employees.
- This parking will be replaced if and when the site is developed.

We would be willing to complete this project if a rental agreement can be reached with the Town. In an effort to recover some of the costs associated with the project, we suggest a rate of \$30/month per parking stall (approximately \$600-\$780/month). A property tax adjustment would also seem appropriate for this lot.

We believe this proposal fits with the Council's Strategic Plan for 2016. We look forward to your response.

Yours truly,

Peter Richmond
President

Wayne Richmond
Owner



Town of Ladysmith

STAFF REPORT

To: Ruth Malli, City Manager
From: Clayton Postings, Director of Parks, Recreation & Culture
Date: March 15, 2015
File No:

RE: ROOF EMERGENCY REPAIR – FRANK JAMESON COMMUNITY CENTRE SWIMMING POOL

RECOMMENDATION(S):

That Council

1. Direct staff to proceed with replacing the roof and wall system above the Oasis swimming pool at Frank Jameson Community Centre (FJCC);
2. Approve \$75,000 to be allocated to the replacement of the roof and wall system at FJCC and that the 2016-2020 Financial Plan be amended accordingly; and
3. Direct that, if the insurance claim is successful for the damage to the roof, the funding allocated above be returned to its original source.

PURPOSE:

The purpose of this staff report is to seek Council's authorization to proceed with replacing the roof and wall system above the Oasis swimming pool at FJCC.

INTRODUCTION/BACKGROUND:

The Oasis swimming pool roof and wall system were damaged as a result of a wind storm in February. The Town had emergency repairs completed immediately, and have had numerous roofing contractors in to investigate repairing the roof. The recommendations from the contractors were that the Town should have an engineer examine the roof as the damage sustained was greater than originally expected and reroofing was not likely possible.

The Town has engaged an engineer who has visited the site and provided a report relating to the roof and wall system. The result is that the project to repair the roof is more extensive than originally anticipated. The engineer's report has determined that the roof and wall area requires a reconstruction.

Staff have contacted the Town's property insurer and a claim has been initiated. The results of this claim are unknown at this time. The Town will continue to work toward recovering costs relating to damages which occurred due to this incident.

SCOPE OF WORK:

An engineering consultant, with experience in building envelopes such as roof and wall systems, will outline suitable options and provide defined criteria for the roof system replacement. Once a suitable system is selected, the project will be tendered for completion.

ALTERNATIVES:

At this time alternative options are limited. All options for replacing the roof and wall systems will be investigated and considered, including green technologies and energy reducing opportunities.

FINANCIAL IMPLICATIONS:

The project of replacing the roof and wall system above the Oasis swimming pool at FJCC was not budgeted for in the 5 year financial plan. Initial project cost estimates are \$75,000. Cost estimates are broken down as follows:

- \$5,000 - engineering services
- \$58,000 - roof replacement
- \$12,000 - wall repairs

The Town has commenced an insurance claim with the property insurer for FJCC. The deductible for claims similar to this is \$10,000, for which the Town would be responsible. The results of the claim are unknown at this time.

LEGAL IMPLICATIONS:

N/A

CITIZEN/PUBLIC RELATIONS IMPLICATIONS:

N/A

INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS:

None.

RESOURCE IMPLICATIONS:

No additional resources for this initiative are required at this time.

ALIGNMENT WITH SUSTAINABILITY VISIONING REPORT:

This initiative aligns with Strategy 7 – A Healthy Community: Continuing to enhance the quality of the public realm; increasing community facilities including health and medical facilities

ALIGNMENT WITH STRATEGIC PRIORITIES:

This project aligns with Council Strategic Priorities relating to Natural and Built Infrastructure.

SUMMARY:

The FJCC Oasis swimming pool roof and wall area requires reconstruction due to damage sustained in a recent wind storm. This project should occur soon to ensure no further damage is sustained.

I concur with the recommendation.



Ruth Malli, City Manager

ATTACHMENTS:

Frank Jameson Community Centre and Swimming Pool Roof Investigation report



March 8, 2016

0037-065

Via email: Imanuel@ladysmith.ca

Town of Ladysmith - Parks Recreation and Culture
Box 220 – 810 Sixth Ave
Ladysmith, BC
V9G 1A2

Attn: Len Manuel - Facilities Maintenance Supervisor

**Re: Frank Jameson Community Centre and Swimming Pool
Roof Investigation**

Dear Mr. Manuel:

Herold Engineering Limited visited the above noted site on March 7th, 2016 to complete a preliminary review of the roof area over the children's pool. It is our understanding that the roofing membrane was damaged as a result of a wind storm in early February. The structure is a pre-engineered with low sloped roofing. As discussed, here is a general summary of the investigation and scope of work for the repair.

According to our observations the possible reasons of the failure is threefold:

A lack of sufficient scuppers and lack of secondary slope which lead to pooling along the parapet of the upper roof area. We could not confirm that there was leaking at the parapet however, an SBS membrane is not intended to be used to hold up liquid water for long periods of time. Water in conjunction with UV will expedite the aging process of the membrane. Furthermore, liquid water with the help of gravity will usually find a weak point in the assembly and migrate below the moisture barrier.

Secondly, it appears that there is a double vapour barrier in the wall assembly between the upper roof and lower roof. There was a layer of poly vapour barrier on the interior side of the wall between the interior metal cladding and the batt insulation; and there was another layer of black Soprema peel and stick membrane adhered directly to the exterior plywood. We could not verify the exact name of the product but it is likely one of the vapour impermeable membranes. Whenever high humidity, high temperature air from a pool below finds inconsistencies in a poly vapour barrier, water vapour will condense in the wall space and accumulate. Because of the two layers of vapour barrier, accumulated liquid water is not able to dry to the outside. We suspect that a layer of fungus was growing at the bottom of the wall and severely deteriorated wood was visible, likely as a result of the moisture build-up.

Finally, systemic aging of the low roof. Alligating was observed on the roof and blistering, up to 1ft x 6" was frequently observed. These are both signs of failure of the SBS membrane on the low roof. It is our opinion that the roofing membrane and possibly the underlying assembly should be replaced in the immediate future.

The low roof and the wall between the lower and upper roof as well as the parapet require a comprehensive building envelope repair to prevent further damage from water. This includes but is not restricted to:

- Addition of a scupper and possible re-sloping of the area adjacent to the parapet
- Reconstruction of the wall between the upper and lower roof assembly
- Reroofing of the lower roof section over the children's pool


After the proper remediation, there would be little potential for pooling along the parapet; the new wall would have improved control of vapour diffusion and little risk of water condensing in the wall assembly; the new roof assembly could reasonably function for 25 to 30 years with little maintenance.

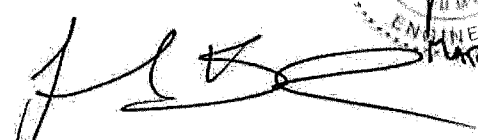
Herold Engineering have completed a comprehensive proposal for design and construction services under a separate letterhead.

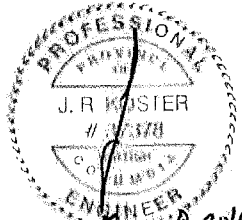
If you have any questions or require further information please contact the undersigned.

Yours truly,

HEROLD ENGINEERING LIMITED


Mar. 07. 2016
Xuezhou (Victor) Wu
BE Tech.


Jarrod Koster, P.Eng
Associate





Town of Ladysmith

STAFF REPORT

To: Ruth Malli, City Manager
From: Erin Anderson, Director of Financial Services
Date: March 14, 2016
File No: 1970-01

Re: Water Parcel Tax

RECOMMENDATION(S):

That Council direct staff to prepare the 2016 Water Parcel Tax rate bylaw at the rate of \$225.00 per parcel.

PURPOSE:

To provide Council with the anticipated water capital projects to support the increase in the water parcel tax.

INTRODUCTION/BACKGROUND:

Earlier in the year, Council adopted its strategic plan for 2016. Included as a priority in that plan was an emphasis on water protection and water management.

Staff presented the draft 2016-2020 Financial Plan with a proposed water parcel tax of \$200, which is a \$40 increase over 2015. During that discussion, Council indicated that a greater increase could be achieved and passed the following resolution:

CS 2016-054 That Council request staff to prepare a report on options to increase the water parcel tax to support capital projects in the water supply system.

During the budget deliberations, staff highlighted the pending construction of the Water Filtration Plant, which is a requirement from the Vancouver Island Health Authority (VIHA), as the major water capital project for 2016/17. The estimate cost for this project is between \$10m and \$14m depending on the treatment option selected and phasing of the project.

The Water Filtration Plant (WFP) also has a significant operating cost associated with it after construction. Half a FTE will be required to run the new plant; additional costs include materials and supplies (chemicals) and utility costs (hydro). These operating costs are absorbed in the water utility rates which are increasing to meet this eventual cost increase.

Staff continue to work on grant funding requests to assist in reducing this financial burden. Borrowing would be required to fund any non-grant amount, and the water parcel tax would be levied to pay for the annual debt servicing. Elector assent is required before any long term borrowing can be approved.

There are other water capital projects that require significant funding. These projects include pipeline (supply) upgrades, connections between the water sources, and raising the capacity of the dam.

Besides these large-scale capital projects, there are other maintenance projects that require funding, such as main replacements within the Town. Wherever possible, these projects will be coordinated with sewer and pavement replacements.

The following projects were included in the 2016-2020 Financial Plan as priority projects:

Projects	2016	2017	2018	2019	2020	Funding
Water Capital						
Holland Dam - Storage Upgrade				2,000,000	2,000,000	Borrowing
Holland Supply Main Rpl: PW to Colonia		402,000				Utility/ Reserves
Holland to Stocking Supply Main (design)	300,000					Utility/ Reserves
Holland to Stocking Supply Main			5,075,000			Borrowing
Stocking Lake Supply Main			200,000	1,840,000		Borrowing
Water Filtration Project	11,000,000					Grant/ Borrowing
Water main Replacement Program		200,000	200,000	200,000	200,000	Utility/ Reserves

Other future projects include:

- Water main Replacement Program 200-462k/year funding: utility
- Arbutus Reservoir - capacity increase 2.75m funding: borrowing/DCC
- Chicken Ladder Intake Upgrade 2.75m funding: borrowing/DCC
- Chicken Ladder Pipeline Replacement 1.08m funding: borrowing/DCC

Significant borrowing for water capital projects will be required over the next few years. There is a limit to how much borrowing a municipality can undertake.

The 2015 Water Parcel Tax is \$160.00 per parcel. The baseline amount for parcel tax is \$126 which includes borrowing of approximately \$58k and main replacement \$250k. Design work for capital projects, equipment or studies is also funded from the parcel tax. The remaining funding is used for the current year project (i.e. Water Filtration Pilot).

Projects	Amount (\$)	Parcel Tax (\$)
Current Borrowing	58,000	16
Main Replacement	250,000	69
Equipment/Design/Studies	150,000	41
Baseline		126

Knowing that the Town will be required to eventually build a Water Filtration Plant, the parcel tax has increased modestly each year to reduce a significant jump in one year.



It is estimated that the parcel tax will increase by \$65 for 2016 and by \$75 each of the following years. The amount of revenue from that increased funding is below:

YEAR	Parcel Tax (\$)	Estimate Revenue (\$)
2016	225	819,000
2017	300	1,098,000
2018	375	1,376,250
2019	450	1,656,000
2020	525	1,937,250

Projects	Amount (\$)	Parcel Tax (\$)
Funding Scenario 1: Filtration Plant	14,000,000 no grant	230
Funding Scenario 2: Filtration Plant	8,000,000 with \$6m in grant	132
Funding Scenario 3: Filtration Plant	11,000,000 no grant	181
Holland to Stocking Supply Main	5,375,000 no grant	88 *
Stocking Lake Supply Main	2,040,000 no grant	34 *
Holland Dam Storage	6,000,000 no grant	99 *

* Funding could come from Water Development Cost Charge, though the DCC Water fund would still be required to borrow for the project and the water utility would still need to borrow for the municipality portion. The Water DCC balance is approximately \$400,000.

The Holland to Stocking Supply Main project (\$5.375 million) is to connect the Stocking Supply Main with Holland Lake, which would provide a direct system connection from Holland Lake to the Town's water system. The main would be sized for a maximum day flow to support a population of 18,000.

The Stocking Lake Supply Main project (\$2.040 million) is the replacement of the a/c supply water main from the balancing reservoir to the Old Chlorination Station. This would reduce the possible loss of water supply from Stocking Lake due to breaks or vandalism.

The Holland Dam Storage project (\$6 million) would see the height of the dam increased by 1.5 meters which would double the storage capacity of the dam.

	SCENARIO #1	SCENARIO #2	SCENARIO #3
Baseline	126	126	126
Filtration Plant	230	132	181
Holland to Stocking Main Supply	88	88	88
Stocking Lake Supply Main	34	34	34
Holland Dam Storage	99	99	99
Total	577	479	528

Other Considerations

Utilizing most of the Town's borrowing capacity for water projects will reduce the Town's ability to move forward on a new Fire Hall or City Hall.

SCOPE OF WORK:

The Parcel Tax requires a bylaw to be passed.

Borrowing is permitted under Part 6, Division 3 the *Community Charter*. This type of debt is Long-term borrowing as it is used to finance a capital asset. The process to borrow is summarized as follows:

- Council to give first 3 readings of the borrowing bylaw
- Bylaw is forwarded to the Province for Inspector's Approval
- Obtain Elector Approval (30 days)
- Adoption of Bylaw
- Quashing Period (30 days)
- Certificate of Approval
- Securities Issue Resolution
- Forward to CVRD to borrow on our behalf

Much of the design and construction work will be done by external consultants.

ALTERNATIVES:

VIHA is requiring the Town to construct a Water Filtration Plant before 2018. If the Town chose not to construct the Plant, it would be in violation of the water purveyor's permit.

The additional water projects could be done in different years. The purpose of the projects is to ensure an adequate and safe supply of the water is available. Projects that rely on DCC funding could be deferred until full DCC funding is available.

FINANCIAL IMPLICATIONS:

Detailed above.

LEGAL IMPLICATIONS:

Borrowing requires the ascent of the electors. Council will direct staff of the preferred method to obtain elector ascent (Alternate Approval Process or a referendum).

CITIZEN/PUBLIC RELATIONS IMPLICATIONS:

There will be advertising and open houses provided prior to the asking the public to vote on the matter.

INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS:

The Financial Services Department will prepare the Financial Plan and associated bylaws for the parcel tax.

The Corporate Services, Infrastructure Services and Financial Services departments will work together on the borrowing process.

RESOURCE IMPLICATIONS:

N/A

ALIGNMENT WITH SUSTAINABILITY VISIONING REPORT:

Ensuring funding is available ensures that the Town continues to provide Innovative Infrastructure.

ALIGNMENT WITH STRATEGIC PRIORITIES:

This aligns with Wise Financial Management and Enhanced Standard of Infrastructure.

SUMMARY:

Council directed staff to present options for an increase in the 2016 Water Parcel Tax. This report details the water capital projects. Borrowing will be required to fund these capital projects, with the debt servicing to be paid through the Water Parcel Tax.

I concur with the recommendation.



Ruth Mallin, City Manager

ATTACHMENT:

none



Town of Ladysmith
STAFF REPORT

To: Ruth Malli, City Manager
From: John Manson, Peng, FEC, Director of Infrastructure Services
Date: March 16, 2016
File No: 5400-20

Re: 4th Ave Road Improvement Project - 2016

RECOMMENDATION(S):

That Council:

1. Approve proceeding with the design phase of the 4th Ave/4th Ave Extension Upgrading Project for construction in late 2016, including the repaving of 4th Ave/4th Ave Extension;
2. Direct that the work start at Hambrook, and continue north;
3. Direct that the road cross section include the construction of a new 2 meter wide shared use bike lane/walkway on the west side, and new curbs on both sides;
4. Direct that construction include various underground utility replacements as outlined in Appendix "B";
5. Waive the purchasing policy and contract with Herold Engineering Ltd. to provide the design work.

PURPOSE:

The purpose of this report is to request Council approval to proceed with a capital improvement project on 4th Ave and 4th Ave Extension in 2016.

INTRODUCTION/BACKGROUND:

As part of the 2016 budget deliberations, Council has discussed allocating funds for the improvement of a section of 4th Ave and 4th Ave Extension. Staff have completed an assessment of the highest priority sections of 4th Ave and 4th Ave extension, which was targeted at the highest priority for pavement replacement in the pavement management plan presented to Council in December of 2015. The sections under consideration are shown in Figure One (Appendix "A"), and in additional detail in Appendix "B".

Staff have included the following components in the project scope:

- Pavement Replacement, (current pavement width);
- New Curb and Gutter each side;
- New 2.0 meter wide multi-use pathway (one side only, west side);
- Replacement of AC Watermain (if required);
- Replacement of AC Sanitary Sewer (if required);
- Replacement of AC, Corrugated Steel Storm Sewer (if required);
- Replacement of Manholes, Hydrants, etc (if required);

The following components have NOT been included in the project scope, but may be considered if funds are available for that purpose:

- Streetlighting;
- Street Trees (possible funding from Green Streets Reserve).

Table One below provides an estimate for the three separate sections that were costed:

Table One - Project Option Summary

Service		Project C		Project B		Project A		Other		Totals	Budget	Shortfall (surplus)
Water	White St	\$55,105	Methuen St	\$122,005	Belair St	\$24,825	Hambrook St		Hambrook St	\$201,935	\$150,000	\$51,935
Sanitary				\$119,515		\$141,228				\$260,743	\$300,000	-\$39,257
Storm and Roadworks		\$208,600		\$307,420		\$325,137		\$25,000		\$866,157	\$765,000	\$101,157
Total		\$263,705		\$548,941		\$491,189		\$25,000		\$1,328,835	\$1,215,000	

The storm and roadworks portion of the project are funded through a variety of sources, which total \$765,000. Staff also allocated \$300,000 for a placeholder sanitary sewer project, which is available for this project. There were insufficient funds in the water utility to provide a similar placeholder replacement project for 2016, however, \$150,000 has been allocated to water quality monitoring equipment (2016), which could be made available for this project as well.

Table One shows that there are insufficient funds in both the water utility and general revenue to fund the entire three sections in 2016. Accordingly, staff investigated two alternative options to phase in the project, one option starting at Hambrook St, and 'working north' (Projects A and B), and another option starting at Belaire, and 'working north' (Projects B and C).

Additional downstream storm drainage work was added to project "A" to provide for a suitable connection point (connects to the existing PVC Storm Sewer at Harley Place). This work is listed as "Other".

Costings for these two options are presented in Tables Two and Three:

Table Two - Project B and A, Methuen to Hambrook St

Service			Project B		Project A		Other		Totals	Budget	Shortfall (surplus)
Water	White St	Methuen St	\$122,005	Belair St	\$24,825	Hambrook St		Hambrook St	\$146,830	\$150,000	-\$3,170
Sanitary			\$119,515		\$141,228				\$260,743	\$300,000	-\$39,257
Storm and Roadworks			\$307,420		\$325,137		\$25,000		\$657,557	\$765,000	-\$107,443
Total			\$548,941		\$491,189		\$25,000		\$1,065,130	\$1,215,000	

Table Three - Project C and B, White to Belair St

Service		Project C	Project B		Project A		Other		Totals	Budget	Shortfall (surplus)
Water	White St	\$55,105	\$122,005	Belair St		Hambrook St		Hambrook St	\$177,110	\$150,000	\$27,110
Sanitary		\$0	\$119,515						\$119,515	\$300,000	-\$180,485
Storm and Roadworks		\$208,600	\$307,420						\$516,020	\$765,000	-\$248,980
Total		\$263,705	\$548,941						\$812,645	\$1,215,000	

A typical cross section is shown in Appendix “C”. As noted in Figure One, all three project areas are slated for pavement replacement in the next 5 years. Project “C” is recommended for replacement in 2016, with the more southerly sections to follow in 2017. See Photos below for typical pavement visual condition:

Project “A” (Hambrook to Belaire)



Project "B" (Belaire to Methuen)



Project "C" (Methuen to White)



4th Ave transitions from a major collector north of Belaire, to a minor collector south of Belaire. Projects “B” and “C” would therefore normally be considered a higher priority for replacement; however, as can be seen in Figure “A”, all three sections are going to need replacement anyways in the next 5 years. For this reason, as well as the relatively poor visual condition of the pavement south of Belaire, staff are recommending that the work start at Hambrook, the most southerly section, and proceed in a northerly direction as funds permit.

Upon approval by Council of the project scope, work will need to begin on the design process, with construction to follow in late 2016. The project would be tendered for construction. As the project estimates include a 30% contingency allowance, it may be possible that the scope of the work could be revisited at the completion of the design and/or tendering stage. It is therefore recommended that the scope of the design work include all three projects, and the project consultant revisit costings at the completion of the design, to determine if there is merit in tendering all three sections (the third section could be included as an alternate).

It is further recommended that staff seek a design fee budget from Herold Engineering Ltd, and proceed on that basis, provided that the design budget is within industry standards.

SCOPE OF WORK:

The scope of work includes a capital project for replacement of pavement, watermain replacements, storm drainage replacements, and sanitary main replacements on sections of 4th Ave between Hambrook and White Street.

ALTERNATIVES:

Council could consider proceeding with the work in a different order than as recommended, such as proceeding with Project “B” and “C”, subject to budget availability.

FINANCIAL IMPLICATIONS:

There are likely not sufficient funds in the 2016 budget to undertake all three projects. However, this can be re-assessed at the completion of the design or tendering phase, and a final decision can be made at that time, or alternatively, upon review of the tenders.

Included in the 2016-2020 Financial Plan was \$765,897:

Taxation:	\$110,000
DCC Roads	168,000
Gas Tax	240,000
Reserve	247,897

The following amounts could be reallocated from the respective utility fund, though transfers between the utility accounts is not recommended:

Sewer Main Replacement	\$300,000
Water Quality Monitoring Equipment	\$150,000



LEGAL IMPLICATIONS:

None.

CITIZEN/PUBLIC RELATIONS IMPLICATIONS:

Council may also wish to consider if a public information meeting would be appropriate to advise the public of the project and seek additional feedback on the design.

INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS:

None.

RESOURCE IMPLICATIONS:

As the capital project will need to be completed by the end of 2016, project design and tendering will need to occur this spring. The majority of the work will be managed by the project consultant.

ALIGNMENT WITH SUSTAINABILITY VISIONING REPORT:

This project aligns with the Innovative Infrastructure Vision.

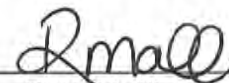
ALIGNMENT WITH STRATEGIC PRIORITIES:

This project aligns with the Enhanced Standard of Infrastructure.

SUMMARY:

The Town has budgeted funds in 2016 to improve 4th Ave. This report outlines 3 potential projects for Council's consideration for construction in 2016. It is recommended that the work start at Hambrook, and proceed north as funds allow. Current cost estimates indicate that the budget would allow for construction from Hambrook to Methuen. However, it is recommended that design for all three projects be undertaken at this time (Hambrook to White), and a review of the project scope be undertaken upon completion of design and/or submission of tenders, with the intent to construct as many projects as funds will allow. It is also recommended that Council consider retaining Herold Engineering to undertake the design and construction management of the project on behalf of the Town.

I concur with the recommendation.



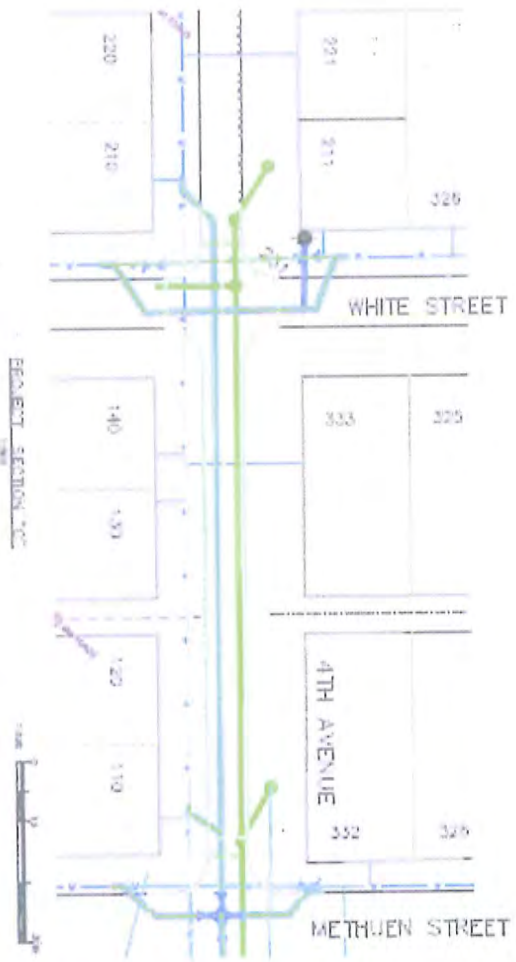
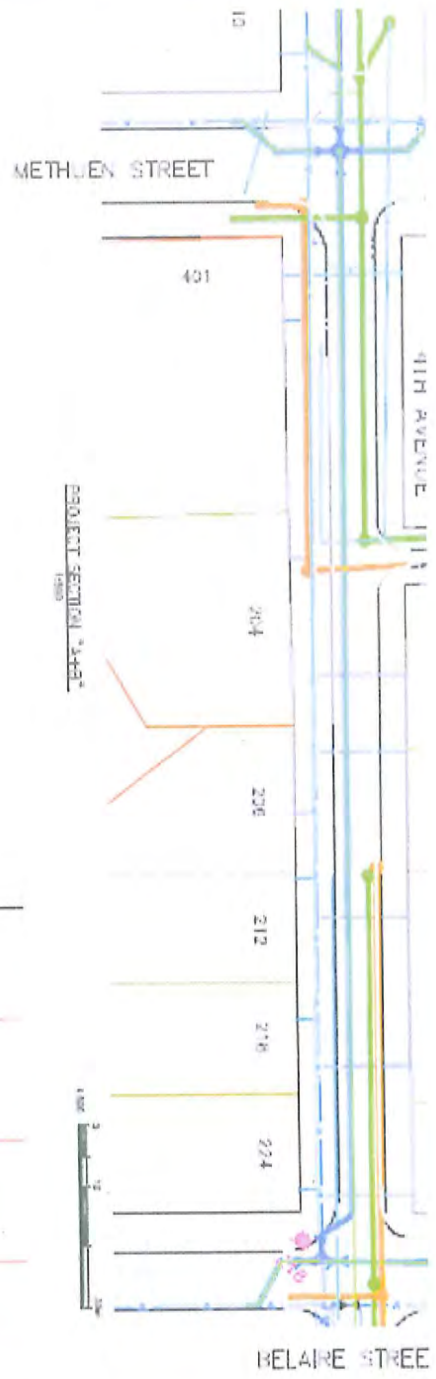
Ruth Mall, City Manager

ATTACHMENTS:

- Appendix "A" – Figure "A", Overview of Projects
- Appendix "B" – Potential Scope of Construction
- Appendix "C" – Typical Road Cross Section





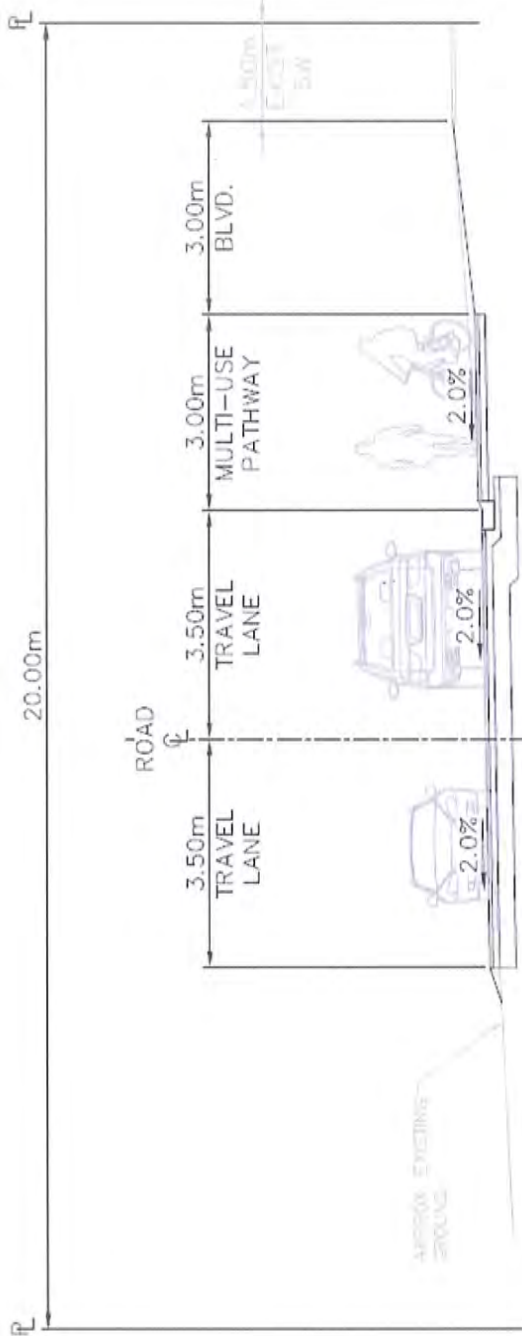


APPENDIX 'B'

File: H:\Projects\0037-064 4th Avenue Reconstruction - Civil\040 Drawings\0037-064 Fourth St Upgrade.dwg Plot Time: Mar. 11, 16 10:44 AM User: Damon Kennedy
 © Copyright reserved. This drawing remains the exclusive property of Herold Engineering Limited and may not be reused or reproduced without written consent of Herold Engineering Limited.



3701 Shepton Rd, Nanaimo, BC V9T 2H1
 Tel: 250-751-8558 Fax: 250-751-8559
 Email: mail@heroldengineering.com



10.0m ROAD X-SECTION
 1:100

4TH AVENUE RECONSTRUCTION				10.0m ROAD X-SECTION			
TOWN OF LADYSMITH				BETWEEN METHUEN AND BELAIRE			
PROJECT No. 0037-064	DESIGNED GPH	DESIGN REVIEW GPH	DRAFTED DJK	DRAFTING REVIEW DJK	SCALE 1:100	DRAWING No. SK-1	REV. A

DESTROY ALL DRAWINGS SHOWING PREVIOUS REVISION



SCHEDULE "A"

TOWN OF LADYSMITH

Waterworks Regulations Bylaw 1999, No. 1298, Amendment Bylaw 2016, No. 1902

1 METERED SINGLE UNIT DWELLING

Per billing quarter:

Base Rate, including consumption to 25 m ³	\$ 26.95	
Next 26 m ³ to 50 m ³	\$ 0.6655	Per m ³
Next 51 m ³ to 75 m ³	\$ 0.7865	Per m ³
Next 76 m ³ to 100 m ³	\$ 0.9680	Per m ³
Next 101 m ³ to 125 m ³	\$ 1.2705	Per m ³
Over 125 m ³	\$ 1.6940	Per m ³

2 METERED SERVICE - all other users

Per billing quarter:

Base Rate, including consumption to 25 m ³	\$ 26.95	
Over 25 m ³	\$ 0.6050	Per m ³

3 NON-METER SERVICE

Per billing quarter: \$ 46.86 Per unit

4 SERVICE CONNECTION RATES

Where a service connection has not been previously provided to a parcel but where the Public Waterworks system front or abuts the parcel:

(A) 19 mm (3/4") service connection including meter, meter box, meter setter, check valves, shut-off valves and other related appurtenances: \$2,400 per connection

(B) Larger than 19 mm (3/4") shall be at cost, but no less than: \$2,400 per connection

Where a service connection has been previously provided to a parcel:

(C) service connection including meter, meter box, meter setter, check valves, shut-off valves and other related appurtenances and is the requested size: \$ 100 per connection

(D) upgrading of that service is size including installation of a water meter, meter box, meter setter, check valves, shut-off valve and any other related appurtenances shall be at cost, but not less than: \$2,400 per connection

5 FINES

Every person who violates any provision of this bylaw shall be guilty of an offence punishable on summary conviction and shall be liable to a fine or to imprisonment for not more than 6 months, or both. Each day that a violation of the provisions of this bylaw occurs, exist or is permitted to occur or exists, shall constitute a separate offense. \$ 2,000 per offence

Effective April 1, 2016.

TOWN OF LADYSMITH

BYLAW NO. 1903

A bylaw to amend the Sanitary Sewer Rates Bylaw 1999, No. 1299 of the Town of Ladysmith.

WHEREAS pursuant to the *Community Charter*, The Municipal Council may, by bylaw, regulate, prohibit and impose requirements in relation to municipal services:

NOW THEREFORE the Municipal Council of the Town of Ladysmith in open meeting assembled enacts as follows:

Amendment

1. Schedule "A" of "Sanitary Sewer Rates Bylaw 1999, No. 1299, Amendment Bylaw 2015, No. 1874" is hereby replaced with the attached Schedule "A".
2. The provisions of this bylaw shall become effective and be in force as of April 1, 2016.

Citation

3. This bylaw may be cited as "Town of Ladysmith Sanitary Sewer Rates Bylaw 1999, No. 1299, Amendment Bylaw 2016, No. 1903".

READ A FIRST TIME on the 7th day of March, 2016

READ A SECOND TIME on the 7th day of March, 2016

READ A THIRD TIME on the 7th day of March, 2016

ADOPTED on the day of

Mayor (A. Stone)

Corporate Officer (S. Bowden)

SCHEDULE "A"

TOWN OF LADYSMITH

Sewer Rates Bylaw 1999, No. 1299, Amendment Bylaw 2016, No. 1903

SCHEDULE OF RATES

CLASSIFICATION		Sewer Charge Per Month
Residences or Apartments:	For each Dwelling Unit	\$16.80
Motels & Auto Courts:	Premises of owner or operator	\$16.80
	For each rental unit	\$ 2.57
Mobile Home Parks:	Public rest rooms and/or service rooms	\$16.80
	For each mobile home with sewer connection	\$16.80
Hotels:	Owners or managers quarters	\$16.80
	Per apartment for rent	\$16.80
	Per room for rent	\$ 2.57
Beer Parlours, Pubs, Licenced Cabarets & Lounges:	For each separately licenced area	\$35.02
Cafes, Restaurants & Dining Rooms:		\$35.02
Offices, Shops and Stores:	Per office, store & store unit not otherwise specified	\$16.80
Store(s) and Suites(s) combined:	Per store unit	\$16.80
	Per suite	\$16.80
Stores(s) and Office(s) combined:	Per store unit	\$16.80
	per office unit	\$16.80
Office Building:	per office unit	\$16.80
Laundry or Laundromat:		\$55.65
Services Stations and Garages:	Without car wash	\$16.80
	With car wash	\$37.43
Public or Social Club with licenced bar:		\$35.02
Church Hall, Public Hall or Lodge Room		\$13.02
Hospitals & Nursing Homes	per bed	\$ 7.82
Schools	per classroom, auditorium or office	\$16.80

Effective April 1, 2016

TOWN OF LADYSMITH

BYLAW NO. 1904

A housekeeping bylaw to amend "Town of Ladysmith Zoning Bylaw 2014, No. 1860"

WHEREAS pursuant to the *Local Government Act*, the Municipal Council is empowered to amend the Zoning Bylaw;

AND WHEREAS after the close of the Public Hearing and with due regard to the reports received, the Municipal Council considers it advisable to amend "Town of Ladysmith Zoning Bylaw 2014, No. 1860";

NOW THEREFORE the Council of the Town of Ladysmith in open meeting assembled enacts as follows:

- (1) Schedule A - Zoning Bylaw Text of "Town of Ladysmith Zoning Bylaw 2014, No. 1860" is hereby amended as follows:

DEFINITIONS

- (a) Section 4.1(a) is hereby amended as follows:
- (i) The definition of "Civic Use" is deleted and the following definition is substituted:
"CIVIC USE: means the *Use of Land, Buildings or Structures* for civic activities and operations for municipal offices, cemetery or columbarium, community centre or hall, fire hall, police station, ambulance station, hospital, *Public Works Yard* or *Public Utility Use*."
 - (ii) The definition of 'Funeral Parlour' is deleted and the following definition is substituted:
"FUNERAL HOME: means premises used for preparing human remains for burial or other end of life processes, and conducting funeral services, but excludes facilities for cremation or aquamation."
 - (iii) The definition of 'Moorage' is deleted and the following definition is substituted:
"MOORAGE: means the attachment of a *Personal Watercraft, Boat*, seaplane and other marine *Boats* to a *Wharf, Dock* or float, or to a mooring buoy that is in turn anchored to the seabed."
 - (iv) The definition of 'Public Utility Use' is deleted and the following definition is substituted:
"PUBLIC UTILITY USE: means the *Use of Land, Buildings, or Structures* for the provision of community water services; community sewer services; community surface water drainage services; composting of municipal generated bio-solids, public access; natural gas pipeline serving the community; gas, electric and telecommunication service; district energy or heat systems; or other similar *Uses* or services."
 - (v) Add a definition for 'Public Works Yard' following the definition of 'Public Utility Use' as follows:

"PUBLIC WORKS YARD: means the *Use of Land,*

Buildings or Structures for parks and municipal infrastructure operations, including municipal composting, processing or storage for use by municipal operations, community organizations, residents or for *Wholesale Sales*.”

- (vi) Add a definition for ‘Streamside Protection and Enhancement Area’ following the definition of ‘Storage Yard’ as follows:
- “STREAMSIDE PROTECTION AND ENHANCEMENT AREA: means an area (a) adjacent to a stream that links aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential adjacent upland vegetation that exerts an influence on the stream, and (b) the size of which is determined according to the Riparian Areas Regulation on the basis of an assessment report provided by a qualified environmental professional in respect of a development proposal.”

GENERAL REGULATIONS

- (b) Section 5.6 ‘Heat Pumps’ is deleted and the following is substituted:
- “(a) Heat pumps shall be located in a *Rear Yard* or *Side Yard* only and be sited a minimum of 1.0 metre from a *Parcel Line*.”
- (c) Section 5.9 ‘Accessory Buildings, Structures and Uses’ is amended by adding the following to the end of Section 5.9:
- “(i) No *Accessory Building* or *Structure* shall include *Kitchen Facilities* unless it is a *Coach House Dwelling*.”
- (d) Section 5.20 ‘Fence Regulations’ is amended as follows:
- (i) Section 5.20(d) is deleted and the following is substituted:
- “(d) Despite Section 5.20(a), a pergola, trellis, gate, or similar *Structure* shall not exceed 2.7 metres in *Height*.”
- (ii) The following is added to the end of Section 5.20:
- “(e) Despite Section 5.20(a), a solid masonry style fence shall not exceed 0.8 metres in *Height* in a *Commercial Zone* or in the *Live/Work Residential (R-2-LW) Zone*.”

SPECIFIC USE REGULATIONS

- (e) Section 6.3 ‘Uses Prohibited in All Zones’ is amended by deleting Section 6.3(a)(ii) and the following is substituted:
- “(ii) Commercial composting, processing or storage, including production in the Agriculture Land Reserve for application off of the farm operation; except a composting facility which handles municipal generated bio-solids.”
- (f) Section 6.5 ‘Coach House Regulations’ is amended as follows:
- (i) Section 6.5(a)(ii) is deleted and the following is substituted:
- “(ii) When a *Parcel* is a *Corner Parcel*, a *Coach House Dwelling* is permitted when the *Parcel* area is 668 square metres or greater and the front entry of the *Coach House Dwelling* fronts onto the *Lane* or *Exterior Side Parcel Line*.”
- (ii) The following is added to the end of Section 6.5(b):
- “(ix) The maximum permitted size for upper level balconies and decks is 2.9 square metres. Flat roofs may not be used for deck areas.”
- (g) Section 6.8 ‘Home Based Business Regulations’ is amended by deleting

Section 6.8(c)(iii) and the following is substituted:

“(iii)

Dwelling Type	Home Based Business Permitted Size
<i>Dwelling Unit</i>	Shall not exceed a maximum of 40.0 square metres <i>Gross Floor Area</i> or 40 percent of the <i>Dwelling Unit Gross Floor Area</i> , whichever is less.
<i>Coach House Dwelling</i>	Shall not exceed a maximum of 40.0 square metres <i>Gross Floor Area</i> or 50 percent of the <i>Coach House Dwelling Gross Floor Area</i> , whichever is less.

- (h) Section 6.9 ‘Cottage Industry Regulations’ is amended by adding the following to the end of Section 6.9(a):

“(v) Despite Section 6.9(a)(iv) the maximum *Gross Floor Area* for a *Cottage Industry* in the Live/Work Residential (R-2-LW) Zone is 100m².”

LANDSCAPING AND SCREENING REGULATIONS

- (i) Section 7.1 ‘Landscape Requirements’ is amended by adding the following to the end of Section 7.1:

“(h) Despite Section 7.1(f) barbed wire fencing is permitted in the Light Industrial (I-1) Zone and Industrial (I-2) Zone for security purposes.”

- (j) Section 7.2(1) ‘Shade Trees’ is amended by adding the following to the end of Section 7.2(1):

“(f) *Shade Trees* shall be located within the parking area and not at or beyond the edges of the parking area in order to achieve maximum shading of parking spaces.”

PARKING AND LOADING REGULATIONS

- (k) Table 8.1 “Required Off-Street Parking Spaces” is amended by adding a clause to Community Care Facility, Residential - Column 2 as follows:

(i) **TABLE 8.1: REQUIRED OFF-STREET PARKING SPACES**

COLUMN 1 USE	COLUMN 2 REQUIRED NUMBER OF SPACES
ASSEMBLY, INSTITUTIONAL	
<i>Community Care Facility, Residential</i>	1 per operation, plus 1 per employee

- (ii) Delete the use ‘funeral parlor’ in Column 1 and the following is substituted:

“*Funeral Home*”

RESIDENTIAL ZONES

- (l) Section 10.2 ‘Single Dwelling Residential (R-1)’ is amended as follows:

- (i) The table in Section 10.2(5)(e) is deleted and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
-------------	-----------------

<i>Front Parcel Line</i>	6.0 metres
<i>Interior or Exterior Side Parcel Line</i>	3.0 metres
<i>Other Interior Side Parcel Line</i>	1.5 metres
<i>Rear Parcel Line</i>	4.5 metres

(ii) The following is added to the end of Section 10.2:

“7. Site Specific Regulations

a) A *Two Unit Dwelling* is permitted as a *Principal Use* on the *Parcels* legally described as:

- i) Lot 2, District Lot 129, Oyster District, Plan 37258 (521/525 Walkem Road);
- ii) Strata Lot 1 and Strata Lot 2, District Lot 129, Oyster District, Strata Plan 1033, Together with an interest in the Common Property in Proportion to the Unit Entitlement of the Strata Lots as Shown on Form 1 (517/519 Short Close); and
- iii) Strata Lot 1 and Strata Lot 2, District Lot 129, Oyster District, Strata Plan 1034, Together with an interest in the Common Property in Proportion to the Unit Entitlement of the Strata Lots as Shown on Form 1 (521/523 Short Close).”

(m) Section 10.3 ‘Single Dwelling Residential – Small Lot A Zone (R-1-A)’ is amended as follows:

(i) The following is added to the end of Section 10.3(3):

“c) Despite Section 10.3(3)(a), a *Parcel* shall not include a *Streamside Protection and Enhancement Area* within the required minimum *Parcel Area*.

(ii) The table in Section 10.3(5)(c) is deleted and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
<i>Front Parcel Line</i>	4.0 metres
<i>Interior or Exterior Side Parcel Line</i>	2.0 metres
<i>Other Interior Side Parcel Line</i>	1.5 metres
<i>Rear Parcel Line</i>	3.0 metres

(n) Section 10.4 ‘Single Dwelling Residential – Small Lot B Zone (R-1-B)’ is amended as follows:

(i) The following is added to the end of Section 10.4(3):

“c) Despite Section 10.4(3)(a), a *Parcel* shall not include a *Streamside Protection and Enhancement Area* within the required minimum *Parcel Area*.”

(ii) The table in Section 10.4(5)(c) is deleted and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
-------------	-----------------

<i>Front Parcel Line</i>	4.5 metres
<i>Exterior Side Parcel Line</i>	2.0 metres
<i>Interior Side Parcel Line</i>	1.5 metres
<i>Rear Parcel Line</i>	3.0 metres

- (o) Section 10.5 ‘Single Dwelling Residential – Small Lot C Zone (R-1-C)’ is amended by adding the following to the end of Section 10.5(3):

“c) Despite Section 10.5(3)(a), a *Parcel* shall not include a *Streamside Protection and Enhancement Area* within the required minimum *Parcel Area*.”

- (p) Section 10.6 ‘Old Town Residential (R-2)’ is amended as follows:

- (i) The table in Section 10.6(5)(d) is deleted and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
<i>Front Parcel Line</i>	6.0 metres
<i>Interior or Exterior Side Parcel Line</i>	3.0 metres
<i>Other Interior Side Parcel Line</i>	1.5 metres
<i>Rear Parcel Line</i>	4.5 metres

- (ii) Section 10.6(12)(a) is deleted and the following is substituted:

“(a) Prior to construction of a *Dwelling Unit* on *Parcels 277* square metres in size in the High Street Intensive Residential Area, an owner of property shall apply to the Town of Ladysmith for a High Street Intensive Residential Development Permit.”

- (q) Section 10.7 ‘Bayview Residential (R-2-A)’ is amended as follows:

- (i) The following is added to the end of Section 10.7(4):
- “(d) No *Two Unit Dwelling* shall have a *Finished Floor Area* that is less than 137.0 square metres.
- (e) No *Two Unit Dwelling* shall have a *Finished Floor Area* that exceeds 50.0 percent of the *Parcel* area or 390.0 square metres, whichever is less.”

- (ii) The table in Section 10.7(5)(c) is deleted and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
<i>Front Parcel Line</i>	6.0 metres
<i>Interior or Exterior Side Parcel Line</i>	3.0 metres
<i>Other Interior Side Parcel Line</i>	1.5 metres
<i>Rear Parcel Line,</i> where the parcel slopes up to the rear	7.5 metres
<i>Rear Parcel Line,</i> where the parcel slopes down to the rear	1.5 metres

- (r) Section 10.9 ‘Live/Work Residential (R-2-LW)’ is amended as follows:

- (i) The following is added to the end of Section 10.9(4):

“(d) No *Two Unit Dwelling* shall have a *Finished Floor Area* that is less than 137.0 square metres.

(e) No *Two Unit Dwelling* shall have a *Finished Floor Area* that exceeds 50.0 percent of the *Parcel* area or 390.0 square metres, whichever is less.”

- (ii) The table in Section 10.9(5)(c) is deleted and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
<i>Front Parcel Line</i>	6.0 metres
<i>Interior or Exterior Side Parcel Line</i>	3.0 metres
<i>Other Interior Side Parcel Line</i>	1.5 metres
<i>Rear Parcel Line</i>	4.5 metres

- (s) Section 10.11 ‘Low Density Residential (R-3-A)’ is amended by deleting the table in Section 10.11(5)(d) and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
<i>Front Parcel Line</i>	6.0 metres
<i>Interior or Exterior Side Parcel Line</i>	3.0 metres
<i>Rear Parcel Line</i>	4.5 metres

COMMERCIAL ZONES

- (t) Section 11.1 ‘Local Commercial (C-1)’ is amended by deleting the table in Section 11.1(5)(d) and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
<i>Front Parcel Line</i>	6.0 metres
<i>Interior or Exterior Side Parcel Line</i>	3.0 metres
<i>Other Interior Side Parcel Line</i>	1.5 metres
<i>Rear Parcel Line</i>	3.0 metres

- (u) Section 11.2 ‘Downtown Commercial (C-2)’ is amended as follows:

- (i) Section 11.2(1)(t) “*Funeral Parlor*” is deleted.
- (ii) The following is added to the end of Section 11.2(9):
“(b) Coffee roasting is not a permitted *Cottage Industry*.”
- (iii) The following is added to the end of Section 11.2(10):
“(d) For the *Parcel* legally described as Lot 12, Block 30, District Lot 24, Oyster District, Plan 703A (112 French Street), *Funeral Home* is a permitted *Principal Use*”.

- (v) Section 11.3 ‘Highway Service Commercial (C-3)’ is amended by deleting Section 11.3(5)(a) and the following is substituted:

“(a) No *Principal Building* shall exceed a *Height* of 6.0 metres.”

INDUSTRIAL ZONES

- (w) Section 12.2 ‘Light Industrial (I-1)’ is amended by deleting Section 12.2(1)(l) “*Food Truck*”.

INSTITUTIONAL ZONES

- (x) Section 13.2 ‘Park and Recreation (P-2)’ is amended by adding the following to the end of Section 13.2:

- “9. Site Specific Regulations
a) For the *Community Garden* located at 525 Second Avenue *Urban Agriculture* is a permitted *Principal Use*.”

AGRICULTURE ZONES

- (y) Section 14.1 ‘Primary Agriculture (A-1)’ is amended as follows:

- (i) Section 14.1(4)(d) is deleted and the following is substituted:
“(d) No *Building* or *Structure* shall exceed a *Parcel Coverage* of 35.0 percent.”
- (ii) The following is added to the end of Section 14.1(4):
“(f) Despite Section 14.1(4)(d), greenhouse *Structures* shall not exceed a *Parcel Coverage* of 75.0 percent.”
- (iii) Section 14.1(5)(a) is deleted and the following is substituted:
“(a) No *Principal Building* or *Structure* used for *Farm Use* shall exceed a *Height* of 15.0 metres.”
- (iv) The following is added to the end of Section 14.1(5):
“(h) Despite Section 5.2(e), no *Principal* or *Accessory Building* or *Structure* for a *Farm Use* shall be located within 30.0 metres from the *Natural Boundary* of a *Watercourse*.”

- (z) Section 14.2 ‘Agriculture and Resort Recreation (A-RR)’ is amended as follows:

- (i) Section 14.2(7)(d) is deleted and the following is substituted:
“(d) No *Building* or *Structure* located in Sub-Area A shall exceed a *Parcel Coverage* of 35.0 percent.”
- (ii) The following is added to the end of Section 14.2(7):
“(g) Greenhouse *Structures* shall not exceed a *Parcel Coverage* of 75.0 percent.”
- (iii) The following is added to the end of Section 14.2(8):
“(i) No *Principal Building* or *Structure* used for *Farm Use* shall exceed a *Height* of 15 metres.”
- (iv) The following is added to the end of Section 14.2(8):
“(j) Despite Section 5.2(e), no *Principal* or *Accessory Building* or *Structure* for a *Farm Use* shall be located within 30.0 metres from the *Natural Boundary* of a *Watercourse*.”

COMPREHENSIVE DEVELOPMENT ZONES

- (aa) Section 17.3 ‘Comprehensive Development 3 – Malone Residential (CD-3)’ is amended by deleting the table in Section 17.3(11)(d) and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
<i>Front Parcel Line</i>	4.5 metres

<i>Exterior Side Parcel Line</i>	3.0 metres
<i>Interior Side Parcel Line</i>	1.5 metres
<i>Rear Parcel Line</i>	4.5 metres

- (bb) Section 17.4 ‘Comprehensive Development 4 – Waterfront Reserve Zone (CD-4)’ is amended by deleting the table in Section 17.4(7)(b) and the following table is substituted:

PARCEL LINE	MINIMUM SETBACK
<i>Front Parcel Line</i>	6.0 metres
<i>Interior or Exterior Side Parcel Line</i>	3.0 metres
<i>Rear Parcel Line</i>	3.0 metres

- (cc) Schedule A - Zoning Bylaw Text of "Town of Ladysmith Zoning Bylaw 2014, No. 1860" is hereby amended by correcting punctuation, numbering, and grammatical errors.
- (2) Schedule B – Zoning Bylaw Map of "Town of Ladysmith Zoning Bylaw 2014, No. 1860" is hereby amended as follows:
- (a) By placing “Low Density Residential (R-3-A)” on the subject property legally described as Strata Lot A, B, C, and D, District Lot 150, Oyster District, Strata Plan VIS5668, together with an interest in the common property in proportion to the unit entitlement of the strata lot as shown on Form V (100 Gifford Road) as shown in ‘Schedule I’ attached to and forming part of this Bylaw.
- (b) By replacing incorrect street addresses.

CITATION

- (3) This bylaw may be cited for all purposes as "Town of Ladysmith Zoning Bylaw 2014, No. 1860 Amendment Bylaw (No. 4), 2016, No. 1904”.

READ A FIRST TIME on the _____ day of _____ 2016

READ A SECOND TIME on the _____ day of _____ 2016

PUBLIC HEARING held pursuant to the provisions of the *Local Government Act*

on the _____ day of _____ 2016

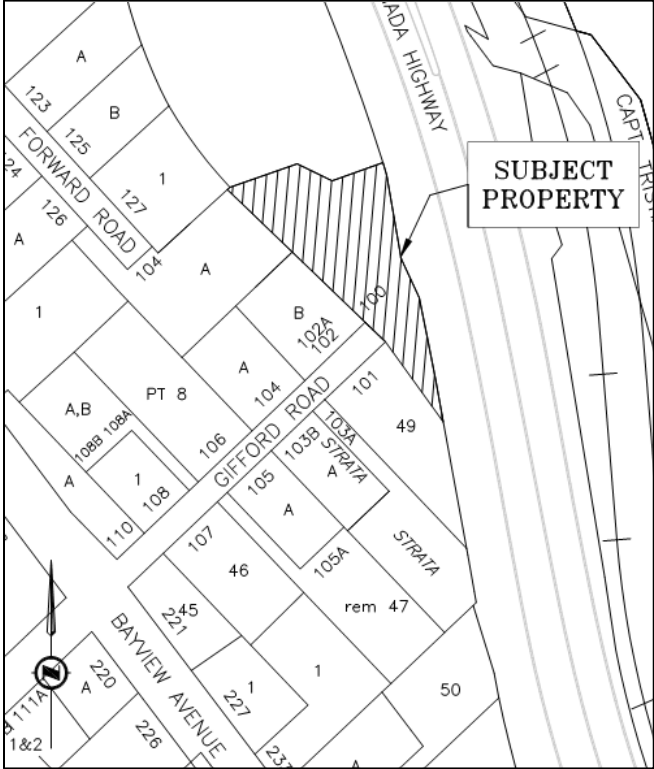
READ A THIRD TIME on the _____ day of _____ 2016

ADOPTED on the _____ day of _____ 2016

Mayor (A. Stone)

Corporate Officer (S. Bowden)

Bylaw No. 1904 - Schedule I



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Hello Climate Smart Businesses!

This is a friendly reminder of this invitation to sign on to a letter in support of a stronger tax and financial incentives – such as an investment tax credit – as part of BC's new **Climate Leadership Plan** consultation period. The deadline to sign on is **March 23, 2016**.

This opportunity to take action follows from Climate Smart's post-Paris briefing on climate policy solutions on January 28, 2016, where the businesses in attendance expressed strong support for financial incentives like investment tax credits or grants, as well as increasing the carbon tax.

You can download the letter here.

Signing on to the letter is simple. Before **March 23**, click [here](#) to send the following to bccarbontax@pembina.org, CCing elizabeth@climatesmartbusiness.com:

- Company
- Contact person
- Email address

Together with the **Pembina Institute**, **Clean Energy Canada**, **Clean Energy BC** and the **Board of Change**, **Climate Smart** initiated this letter to bring the voice of BC businesses to the process.

This letter focuses on increasing the carbon tax and using carbon tax revenue to support other fiscal policies to realize significant greenhouse gas reductions, while ensuring our businesses remain competitive in a global carbon-constrained economy. It supports the recommendations by the **Climate Leadership Team**, a group appointed by the Premier to provide advice on the province's next steps on climate, and consisting of members from business, local governments, First Nations, environmental groups, and academics.

Thank you for considering signing on, and for helping ensure that the BC Government hears from its business community that we need strong climate policies.

Sincerely,

Elizabeth Sheehan, President, and the Climate Smart team