



AGENDA
REGULAR MEETING OF THE BARRHEAD TOWN COUNCIL
TUESDAY, JUNE 26, 2018 AT 5:30 P.M.
IN THE TOWN OF BARRHEAD COUNCIL CHAMBERS

Barrhead....a quality community....giving a quality lifestyle

Present

Others Present

Regret

1. Call to Order
2. Consideration of Agenda (Additions - Deletions)
3. Confirmation of Minutes
 - (a) Regular Meeting Minutes – June 12, 2018
4. Public Hearings
 - (a) There are no Public Hearings
5. Delegations
 - (a) Delegation at 5:30 p.m. – Community Futures Yellowhead East
6. Old Business
 - (a) There is no Old Business
7. New Business
 - (a) Monthly Bank Statement
 - (b) Strategic Priorities Chart
 - (c) Connect by All-Net – Alert System

8. Reports - The Council Reports

(a) Council Reports as of June 26, 2018

- Barrhead & District Social Housing Association
- Chamber of Commerce
- Family & Community Support Services Society
- Library Board/Yellowhead Regional Library Board
- Twinning Committee

(b) CAO's Report and Department Head Report

9. Minutes

(a) Barrhead & District Family & Community Support Services Society – May 17, 2018

(b) Barrhead Regional Water Commission – June 12, 2018

10. Bylaws

(a) Bylaw 05-2018, the Municipal Public Utilities Amendment Bylaw

11. Correspondence

(a) 2017 Annual Environmental Monitoring Report for the Swan Hills Treatment Centre

(b) Federation of Canadian Municipalities (FCM) Special Advocacy Fund

(c) Alberta Development Officers Week Proclamation September 24 to September 28, 2018

(d) Yellowhead Regional Library Board Meeting – March 5, 2018

12. For the Good of Council

13. Tabled Items

14. In-Camera

(a) Land – Pursuant to Section 16 of the FOIP Act

(b) Land – Pursuant to Section 16 of the FOIP Act

(c) Legal – Pursuant to Section 24(a) of the FOIP Act

(d) Labour – Pursuant to Section 24(g) of the FOIP Act

(e) Labour – Pursuant to Section 17 of the FOIP Act

(f) Labour – Pursuant to Section 24 of the FOIP Act

15. Adjourn

MINUTES OF THE REGULAR MEETING OF THE BARRHEAD
TOWN COUNCIL HELD TUESDAY, JUNE 12, 2018,
IN THE TOWN OF BARRHEAD COUNCIL CHAMBERS

PRESENT	Mayor McKenzie, Crs: T. Assaf, D. Kluin, R. Klumph, S. Oswald (entered at 5:37 p.m.), L. Penny and D. Smith Officials: Kathy Vickery, Director of Corporate Services and Cheryl Callihoo, Director of Development & Legislative Services, Shallon Touet, Recreation Director Others: Barry Kerton, Barrhead Leader and Mark Cappis, 97.9 The Range
ABSENT	Martin Taylor, CAO
CALL TO ORDER	Mayor McKenzie called the meeting to order at 5:30 p.m.
AGENDA	The agenda was reviewed.
195-18	Moved by Cr. Smith that the agenda be accepted with the following amendments: <ul style="list-style-type: none">• 7(e) 2018 Sidewalk Program• 8(a) Yellowhead Regional Library Report• 11(f) Blue Heron AGM Information CARRIED UNANIMOUSLY
DELEGATION – MELISSA LOTHOLZ	Mayor McKenzie and Council welcomed Ms. Melissa Lotholz at 5:31 p.m. Ms. Melissa Lotholz was presented with the Blue Heron Award for her outstanding achievement in Sport and Community Recognition. She provided Council with an overview of her Olympic experience.
ENTERED	Cr. Oswald entered the meeting at 5:37 p.m.
EXITED	Mayor McKenzie and Council thanked Ms. Melissa Lotholz and she exited the Chambers at 5:45 p.m.
CONFIRMATION OF MINUTES	The Minutes of the Town Council Regular Meeting of May 22, 2018 were reviewed.
196-18	Moved by Cr. Penny that the Minutes of the Town Council Regular Meeting of May 22, 2018 be accepted as presented. CARRIED UNANIMOUSLY
MUNICIPAL SUSTAINABILITY INITIATIVES OPERATING GRANT	The allocation of the 2018 Municipal Sustainability Initiatives (MSI) Operating Grant was reviewed by Kathy Vickery.
197-18	Moved by Cr. Assaf that Council authorize the 2018 Municipal Sustainability Operating Grant application to be submitted based on allocations to Parks, Sports and Recreation for \$ 74,947.00 and Roads and Bridges for \$ 74,947.00. CARRIED UNANIMOUSLY
TWINNING BUDGET RE-ALLOCATION REQUEST	The Twinning Committee is requesting re-allocation of the existing budget. Cr. Oswald reviewed the information with Council.
198-18	Moved by Cr. Oswald that Council approve the request of the Twinning Committee and re-allocate \$500.00 from line item Conference Fees/Memberships and \$500.00 from line item Promotion/Gifts, for a total of \$1,000.00 to Delegation Activities line item within the approved budget in order to facilitate the upcoming JET Delegation visit and activities. CARRIED UNANIMOUSLY
AGRENA ROOF REPAIRS	The Agrena roof requires some repairs to be undertaken in 2018 and Administration is requesting that Flynn Canada Ltd. be contracted to do the repairs.

199-18 Moved by Cr. Klumph that Council authorize the expenditure of \$22,496.00 plus GST, for Flynn Canada Ltd. to do the recommended repairs to the Agrena roof, with the project being funded from the General Capital Reserve.
CARRIED UNANIMOUSLY

**MAINSTREET MERCHANTS
ASSOCIATION 2018 JULY
FEST REQUEST**

The Mainstreet Merchants Association 2018 July Fest request that the Town of Barrhead waive the fee for the use of the Town’s tables, chairs and staging equipment, was reviewed.

200-18 Moved by Cr. Smith that Council approve a donation the value of the use of the table and chairs to the Mainstreet Merchants for the 2018 July Fest.
CARRIED

IN FAVOR: Mayor D. McKenzie, Crs.: D. Kluin, R. Klumph, S. Oswald and L. Penny and D. Smith

OPPOSED: Cr. T. Assaf

201-18 Moved by Cr. Penny to advise the Mainstreet Merchants that the Town will be unable to supply the stage for the 2018 July Fest.
CARRIED UNANIMOUSLY

202-18 Moved by Cr. Kluin that the 2018 Street Festival event not be charged a fee for the use of the tables and chairs during their recent event.
CARRIED

IN FAVOR: Mayor D. McKenzie, Crs.: D. Kluin, R. Klumph, S. Oswald and L. Penny and D. Smith

OPPOSED: Cr. T. Assaf

**2018 SIDEWALK
PROGRAM**

An update on the 2018 Sidewalk Program was reviewed.

203-18 Moved by Cr. Smith that Council accept the 2018 Sidewalk Program update as information.
CARRIED UNANIMOUSLY

**REPORTS TO
COUNCIL**

The following Reports to Council as of June 12, 2018, were reviewed:

- Barrhead Agricultural Society
- Yellowhead Regional Library

204-18 Moved by Cr. Oswald that the following Reports to Council as of June 12, 2018, be accepted as information:

- Barrhead Agricultural Society
- Yellowhead Regional Library

CARRIED UNANIMOUSLY

RECESS

205-18 Moved by Cr. Assaf that the meeting be recessed at 6:47 p.m.
CARRIED UNANIMOUSLY

RECONVENED

206-19 Moved by Mayor McKenzie that the meeting be reconvened at 7:00 p.m.
CARRIED UNANIMOUSLY

IN-CAMERA

207-18 Moved by Cr. Smith that Council go in-camera at 7:05 p.m.
CARRIED UNANIMOUSLY

OUT-OF-CAMERA

- 208-18 Moved by Cr. Smith that Council come out-of-camera at 7:47 p.m.
CARRIED UNANIMOUSLY
- 209-18 Moved by Cr. Assaf that Council authorize the execution of the Letter of Engagement between the Town and Russell Farm and Associates to provide consulting services in order to facilitate a review of Human Resource policies and position descriptions, to a maximum cost of \$11,700.00 plus GST, to be funded from the Operating Contingency Reserve.
CARRIED UNANIMOUSLY
- 210-18 Moved by Cr. Klumph to accept the proposed development presentation as information.
CARRIED UNANIMOUSLY

MINUTES TO COUNCIL

- The following Minutes to Council were reviewed:
- Barrhead & District Family & Community Support Services Society – April 19, 2018
 - Barrhead & District Social Housing Association – March 22, 2018
- 211-18 Moved by Cr. Penny that the Minutes to Council be accepted as information.
CARRIED UNANIMOUSLY

INFORMATION ITEMS

- The following information items were reviewed:
- Alberta Health Services – Health Advisory Council Expression of Interest
 - Alberta Recreation & Parks Association – Honour Outstanding Work in Your Community
 - Alberta Recreation & Parks Association – Annual (ARPA) Conference & Energize Workshop “Partners in Progress”
 - Barrhead & Area Regional Crime Coalition (BARCC) Terms of Reference
 - Letter from Municipal Affairs regarding MSI Funding
 - Blue Heron AGM Information
- 212-18 Moved by Cr. Assaf that the information items be accepted as.
CARRIED UNANIMOUSLY

FOR THE GOOD OF COUNCIL

- Mayor McKenzie – Fly in Breakfast was a huge success along with the 2018 Street Festival.
- Cr. Penny – Congratulated Cr. Oswald for organizing the birthdays for 90 plus residents at the Hillcrest.
- Cr. Oswald – Thanked Cr. Penny, Reeve, MLA and the Barrhead Leader for attending the 90 plus birthday event. She congratulated the Senior Rodeo on their event.
- Cr. Klumph – Discussed the FCM Conference and how it was a great experience.

ADJOURN

- 213-18 Moved by Cr. Assaf that the Council Meeting be adjourned at 8:25 p.m.
CARRIED UNANIMOUSLY

TOWN OF BARRHEAD

Mayor, David McKenzie

Director of Corporate Services, Kathy Vickery



REQUEST FOR DECISIONS

Date: June 26, 2018
To: Mayor McKenzie & Members of Council
From: Martin Taylor, CAO
Re: Delegation

Summary

Delegation at 5:30 p.m. – Community Futures Yellowhead East

Overview

Ms. Michelle Jones, the new manager of Community Futures will be meeting with Council to introduce herself and share some upcoming goals of Community Futures.

Recommendations

Recommendation #1

That Council accept the delegation as information.

Respectfully Submitted by:

Martin Taylor, CMC, CLGM
CAO



REQUEST FOR DECISION

Date: June 26, 2018
To: Mayor McKenzie & Members of Council
From: Martin Taylor, CAO
Re: Monthly Bank Statement

Summary

The Monthly Bank Statement for the month ended May 31, 2018.

Overview

Recommendations

Recommendation #1

That Council receive as information the Monthly Bank Statement for the month ended May 31, 2018.

Respectfully Submitted by:

Martin Taylor, CMC, CLGM
CAO

**TOWN OF BARRHEAD
MONTHLY BANK STATEMENT
FOR MONTH ENDED MAY 31, 2018**

PER TOWN OF BARRHEAD:	ATB FINANCIAL	
	GENERAL ACCOUNT	TERM DEPOSITS
Net Balance - Previous Month	1,663,764.13	3,092,320.30
Receipts	617,310.79	
Direct Deposits	777,466.18	
Interest	6,584.38	
Loan Proceeds	0.00	
Transfers from/to Term Deposits	0.00	2,893.06
Cancelled Cheques	12,155.15	
SUBTOTAL	3,077,280.63	3,095,213.36
Disbursements	1,315,804.93	
Debentures/Interest	0.00	
School Requisition	0.00	
Transfers from/to General	2,893.06	0.00
NSF/Returned Cheques or Transfers	62.24	
Postdated Cheques	0.00	
NET BALANCE AT END OF MONTH	1,758,520.40	3,095,213.36

PER BANK:		
Balance at end of month	2,179,179.16	3,095,213.36
Outstanding Deposits	57,225.02	
SUBTOTAL	2,236,404.18	3,095,213.36
Outstanding Cheques	477,883.78	
NET BALANCE AT END OF MONTH	1,758,520.40	3,095,213.36

TERM DEPOSIT SUMMARY
FOR MONTH ENDED MAY 31, 2018

<u>Financial Institution</u>	<u>Term Amount</u>	<u>Interest Rate</u>	<u>Term Started</u>	<u>Investment Details</u>
Servus Credit Union	100,000.00	1.65%	April 10, 2018	90 day term deposit
Servus Credit Union	1,000,000.00	1.53%	May 16, 2018	30 day term deposit
Nova Scotia	100,000.00	1.70%	May 14, 2018	90 day term deposit
TD Canada Trust	100,000.00	0.95%	May 20, 2018	30 day term deposit
ATB Financial	750,000.00	1.55%	May 3, 2018	38 day term deposit
ATB Financial	1,000,000.00	1.55%	May 25, 2018	38 day term deposit
ATB Financial	<u>45,213.36</u>			Interest On Term Account
Total	<u>\$ 3,095,213.36</u>			



REQUEST FOR DECISIONS

Date: June 26, 2018
To: Mayor McKenzie & Members of Council
From: Martin Taylor, CAO
Re: Strategic Priorities Chart

Summary

Strategic Priorities Chart

Overview

Administration would like to recommend that the Town's Strategic Priorities Chart be amended as per the following recommendations.

Recommendations

1. That Council replace Item #3, County ICF & IDP, under the 'Now' section, with the Leisure Study Update under the 'Next' section, AND
2. That Council move Item #3, County ICF & IDP, under the 'Now' section, to 2019 under Legislative Planning, AND
3. That the Strategic Priorities Chart be included in the agenda on a quarterly basis.

Respectfully Submitted by:

Martin Taylor, CMC, CLGM
CAO



TOWN OF BARRHEAD STRATEGIC PRIORITIES CHART January 2018

CORPORATE PRIORITIES (Council/CAO)

NOW

1. **CURLING RINK: Direction**
2. **5 YEAR CAPITAL PLAN: Priorities**
3. ~~COUNTY ICF & IDP~~
4. **ACCESSIBILITY: 2018 Projects Review**
5. **MUNICIPAL DEVELOPMENT PLAN: Draft**

TIMELINE (2018)

June
October
March
February
April

NEXT

- PARKS & FACILITIES: Priorities
- LONG TERM CAPITAL STRATEGY
- ECONOMIC READINESS STRATEGY: ToR
- PADDLE RIVER: Linear Park Concept
- BUSINESS PARK: Options
- FACILITY / PARKS PLAN: ToR
- SKATEBOARD PARK: Concept
- LEISURE STUDY: Update
- PARKS / OPEN SPACE PLAN: ToR
- ACCESSIBILITY: Land Use Bylaw
- ACCESSIBILITY: Design Guidelines
- HIGHWAY COMMERCIAL: Area Structure Plan

ADVOCACY / PARTNERSHIPS

- *Business Park: Options (County)*
- *Paddle River: Linear Park Concept (County)*
- *Economic Development Strategy: ToR*

OPERATIONAL STRATEGIES (CAO/Staff)

CHIEF ADMINISTRATIVE OFFICER

1. **COUNTY ICF / IDP: Meeting** - Mar.
 2. **BUSINESS PARK: Options** -
 3. **HIGHWAY COMMERCIAL: ASP** - Oct.
- Human Resource: Policy Review
 - ECONOMIC READINESS STRATEGY: ToR

LEGISLATIVE PLANNING

1. **MUNICIPAL DEVELOPMENT PLAN: Draft** - April
 2. **MGA Compliance: Checklist** - Mar.
 3. **IDP: Process Agreement** - Oct.
- GIS Upgrade
 - Offsite Levies Bylaw

PARKS & RECREATION

1. **CURLING RINK: Direction** - June
 2. **PARKS & FACILITIES: Priorities** - May
 3. **Tree Program: Proposal** - Oct.
- SKATEBOARD PARK: Concept
 - Off Leash Dog Park: Concept

CORPORATE SERVICES

1. **5 YEAR CAPITAL PLAN: Priorities** - Feb.
 2. **Finance System Upgrade** - Sept.
 3. **Information Technology Strategy: Scope** - Oct.
- LONG TERM CAPITAL STRATEGY
 - Finance Information System

PROTECTIVE SERVICES

1. **New pumper acquisition** - June
 - 2.
 - 3.
- Wild Land Unit
 -

COMMUNICATION

1. **Community Profile** - Oct.
 2. **ACCESSIBILITY: Awareness Campaign** - June
 3. **Branding Strategy** - Sept.
- -

PUBLIC WORKS

1. **50th & 57th Ave: Tenders** - Feb.
 2. **Lagoon: Tender** - Feb.
 3. **ACCESSIBILITY: 2018 Project Review** - Feb.
- Industrial Water Reservoir
 -

ICF = Inter-municipal Collaboration Framework
IDP = Inter-municipal Development Plan
MDP = Municipal Development Plan
MGA = Municipal Government Act

CODES: BOLD CAPITALS = NOW Priorities; CAPITALS = NEXT Priorities; *Italics* = Advocacy;
Regular Title Case = Operational Strategies



REQUEST FOR DECISIONS

Date: June 26, 2018
To: Mayor McKenzie & Members of Council
From: Martin Taylor, CAO
Re: Connect by All-Net

Summary

Connect by All-Net – Alert System

Overview

The Town's new website provider is All-Net Municipal Solutions and the site will launch in the next few weeks. The 'Connect' application is a robust communications add-on from the same company that allows residents to enroll in emergency alerts, notifications, and general communications. Channels include land lines, cell phones (text message alerts), emails, automatic social media posts, and website alert banners. This system can broadcast a crime notification or a fire ban to all residents, notify residents in a specific area of a service interruption like a water break, and even send out messages regarding calendar events or recreation programs. View their [Demonstration Video](#) for further details.

BARCC (Barrhead & Area Regional Crime Coalition) is taking a collaborative approach in making communities safer. Through coordinated efforts in education, awareness of crime prevention and reporting suspicious activities in reducing crime, BARCC is taking an active role in reducing crime. BARCC has researched and viewed a number of alert, notification systems for our communities and Connect by All-Net is also their recommendation.

The estimated cost to purchase this platform is \$5,485.00 and will be shared equally by the Town of Barrhead, County of Barrhead and Woodlands County. The annual cost is further reduced by approximately \$995.00 by delaying the Smartphone App as suggested by the vendor. The annual renewal will be approximately \$4,000.00, which would continue to be shared by the three municipalities. There are no additional third party charges therefore, the system allows for unlimited messaging and calls.

Connect by All-Net is already connected to the existing national "Alert Ready System" that is in use by the Province, Federal Government and RCMP. Connect by All-Net will be a valuable tool for real-time alert messaging and to support the distribution of municipal information to residents via email, text, phone lines and social media.

The Connect by All-Net Communication Automation Proposal was sent to the County of Barrhead for their Council's decision and was recently approved by their Council. A copy is attached.

Recommendations

1. That Council approve the purchase of Connect by All-Net as the platform to manage and distribute messages to the Town of Barrhead residents, the total maximum cost of \$5,485.00 to be shared equally by the Town of Barrhead, County of Barrhead and Woodlands County, with the cost being funded from the general operating budget.

Respectfully Submitted by:

Martin Taylor, CMC, CLGM
CAO

Connect By all-net

Communication Automation

Municipal officials now have the ability to easily broadcast information on a wide variety of platforms from one central portal.



About Connect



Emergency Alerting



Mass Phone Calling



SMS Text Messaging



Bulk E-mail Messaging



Social Media



Mobile Management

Reach your entire community on any platform with any device!

You now have the ability to easily broadcast information on a wide variety of platforms from one central portal. Connect – By All-Net incorporates 17 years of municipal experience into one central portal to manage and disseminate messages to all your residents via e-mail, smartphone apps, text messages, social media and voice phone lines.

Emergency alert messages from Alert Ready can also be automated to broadcast on your resident's smartphones without any local effort.

Connect has been developed to provide municipal administrators with one central portal to send and manage communication messages to their residents on multiple platforms.

The Connect App also provides your residents with a communication link to your office for the latest municipal information and can include direct feeds from your own municipal website for notices and events.

You now have the ability to connect with your residents like never before!

all-net
municipal solutions

www.ConnectByAllnet.ca

(888) 403-4240

Feature Sheet



Emergency Alerting

A direct feed into Canada's national emergency alerting system (Alert Ready) to disseminate emergency alert messages from all levels of government, Environment Canada and the RCMP. Emergency alerts will appear automatically on mobile phones and you have the option to forward a voice translated alert to resident land line telephones with the click of a button.



Bulk/Mass E-mail

You have the ability to send out an unlimited number of e-mail messages to your residents along with the ability to refine your messages to only go out to users requesting information based on specified topics. The e-mail manager provides you with the ability to create templates for formatting along with a history of all past messages.



SMS Text Messaging

The Connect portal provides you with the ability to send out SMS text messages to residents who prefer to be informed of local information on their mobile phone.



Push Messaging

You can issue smartphone alert messages to each smartphone and tablet with the app installed. Messages will appear on each device without the user having to open the app. You can send out immediate messages or schedule push messages for a future date.



Voice Phone Messages

You can type a voice message and have the message sent out to resident phones. The message will be automatically read via a voice generator. You also have the option to upload a recorded voice message. Emergency alert messages can also be sent out to your resident home phones with one click.



Social Media

Your account will provide you with one click access to your social media accounts (Facebook and Twitter) for the posting and sharing of municipal information.



Account Management

You can manage all your resident accounts as well as the ability to create communication groups for people to select and receive information. You also have a simple public registration form that can be easily incorporated in to any website.



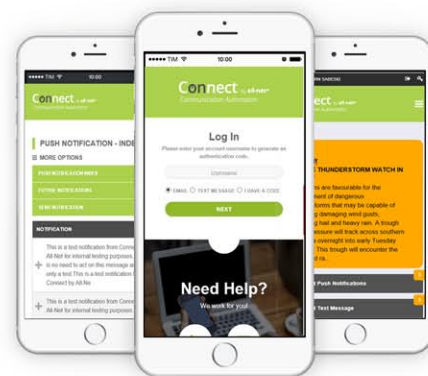
Secure

Your data is all stored and backed up in a secured Canadian data facility with complete redundancy to ensure functionality when you need it.



Mobile Management

The Connect portal provides you with the ability to manage and disseminate messages from any device including a smartphone. The management portal is completely responsive to any mobile device and smartphone. This provides you with the ability to communicate with your residents from any location without the use of a desktop or laptop computer.



www.ConnectByAllnet.ca

(888) 403-4240

all-net
municipal solutions



100-28 Queen Elizabeth Way
Winnipeg, MB R3L 2R1
Phone: (204) 421-9314
Toll Free: (888) 403-4240

www.ConnectByAllnet.ca

Connect By All-Net

Communication Automation

PROPOSAL

PREPARED FOR:

Debbie Oyarzun, M.Sc.
Barrhead County, AB
County Manager (CAO)

CREATED

05/11/2018

PREPARED BY:

A blue ink signature of Vernon Sabeski, written in a cursive style.

Vernon Sabeski

VALID UNTIL

06/11/2018



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ABOUT US



Our objective is to research, develop and deploy municipal applications that assist municipal governments in their goal to provide the best possible service in the most efficient manner possible.

OUR PROFILE

In business for 19 years learning and developing new technologies for municipal administrators.

Our applications have been built with, and for, municipal administrators.

WHAT WE DO

- Research the needs of municipal governments.
- Develop innovative programs to meet the needs of municipal governments
- Provide our municipal clients with ongoing guidance and support.

All-Net.ca is a municipal communications company that employs a unique skillset of municipal experience, advanced programmers and creative minds. All our research and development is focused toward the development and use of municipal software.

One of the biggest advantages of our municipal products are the ability to integrate other products and services in the future. For example, you have the option to integrate your council meetings (All-Net Meetings) or a service request tracking program (Service Tracker) at any time in the future. Your smartphone apps can also be connected to your website data and your website content management system also acts as the content management system for your apps.

Our development is all done in Canada and your data is stored and backed up in Canada.

CONNECT **BY ALL-NET**



Communicate with your residents on any platform including text, e-mail, smartphone and landline phones.

Municipal officials now have the ability to easily broadcast information on a wide variety of platforms from one central portal.

Connect – By All-Net incorporates 19 years of municipal experience into one central portal to manage and disseminate messages to all your residents via e-mail, smartphone apps, text messages, social media and voice phone lines.

Emergency alert messages from Alert Ready can also be automated to broadcast on your resident's smartphones without any local effort.



INDIVIDUAL FEATURES

Connect has been developed to provide municipal administrators with one central portal to send and manage communication messages to their residents on multiple platforms.

The Connect app also provides your residents with a communication link to your office for the latest municipal information and can include direct feeds from your own municipal website for notices and events.

The Connect management portal provides you with:



EMERGENCY ALERTING

A direct feed into Canada's national emergency alerting system (Alert Ready) to disseminate emergency alert messages from all levels of government, Environment Canada and the RCMP. All alert messages appear on a user's phone without having to open the apps

Emergency alerts will appear automatically on the Connect App and you have the option to forward a voice translated alert to resident land line telephones with the click of a button.



MASS E-MAIL

You can send out an unlimited number of e-mail messages to your residents along with the ability to refine your messages to only go out to users requesting information based on specified topics.

The e-mail manager provides you with the ability to create templates for formatting along with a history of all past messages.



TEXT MESSAGING

The Connect portal provides you with the ability to send out SMS text messages to residents who prefer to be informed of local information on their mobile phone.



PUSH MESSAGING

You can issue smartphone alert messages to each smartphone and tablet with the app installed. Messages will appear on each device without the user having to open the app. You can send out immediate messages or schedule push messages for a future date.



VOICE CALLS

You can type a voice message and have the message sent out to resident phones. The message will be automatically read via a voice generator. You also have the option to upload a recorded voice message. Emergency alert messages can also be sent out to your resident home phones with one click.



SOCIAL MEDIA

Your account will provide you with one click access to your social media accounts (Facebook and Twitter) for the posting and sharing of municipal information.



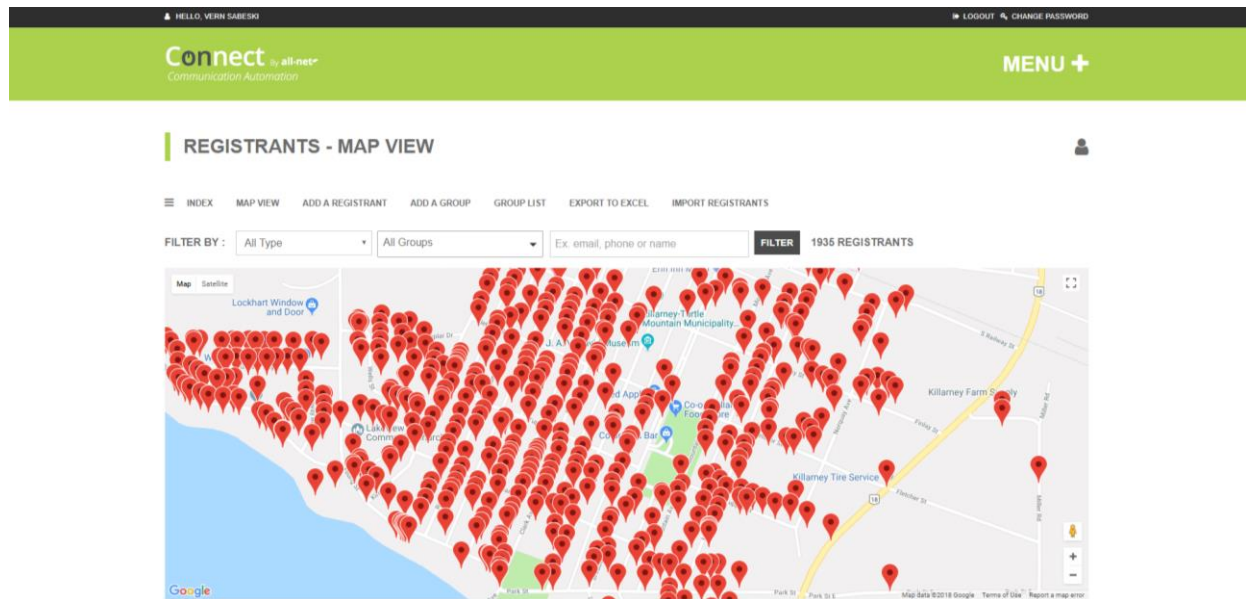
ACCOUNT MANAGEMENT

You can manage all your resident accounts as well as the ability to create communication groups for people to select and receive information. You also have a simple public registration form that can be easily incorporated in to any website.

You also have the ability to create custom administrator accounts to provide users with access to specific groups and specific mediums such as text, voice, e-mail etc.



GIS MAPPING



You can send your messages to a targeted region using our mapping tool. You can design exact regions or use a region template to send a message to a pre-defined region.

For example, you can create map templates for various service regions and then can send out messages to a specific region by selecting that region map template.

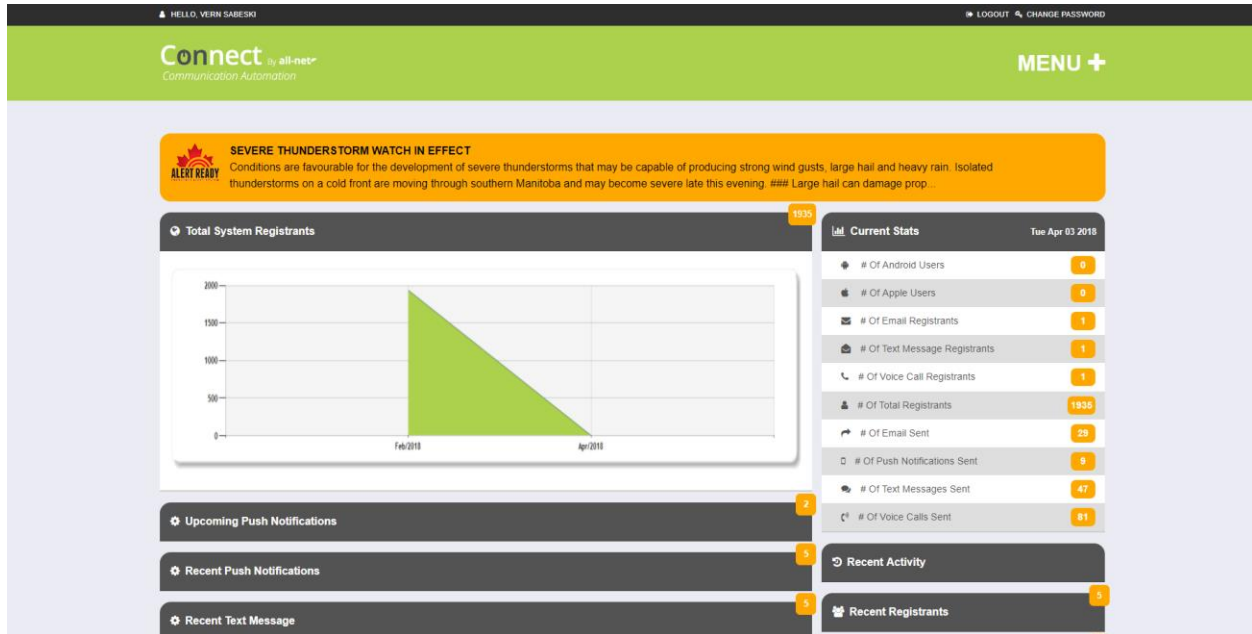
There is no limit to the number of region templates you create, and they can be easily updated at any time.

Emergency alerts are also pre-defined with an alert region. Once you receive an alert from Alert Ready you can adjust the region and ensure it is sent out to all your residents if necessary.

Connect has been developed with municipal administrators to provide you with the ability to communicate with your residents on multiple platforms.

www.ConnectByAllnet.ca

RESIDENT INFORMATION

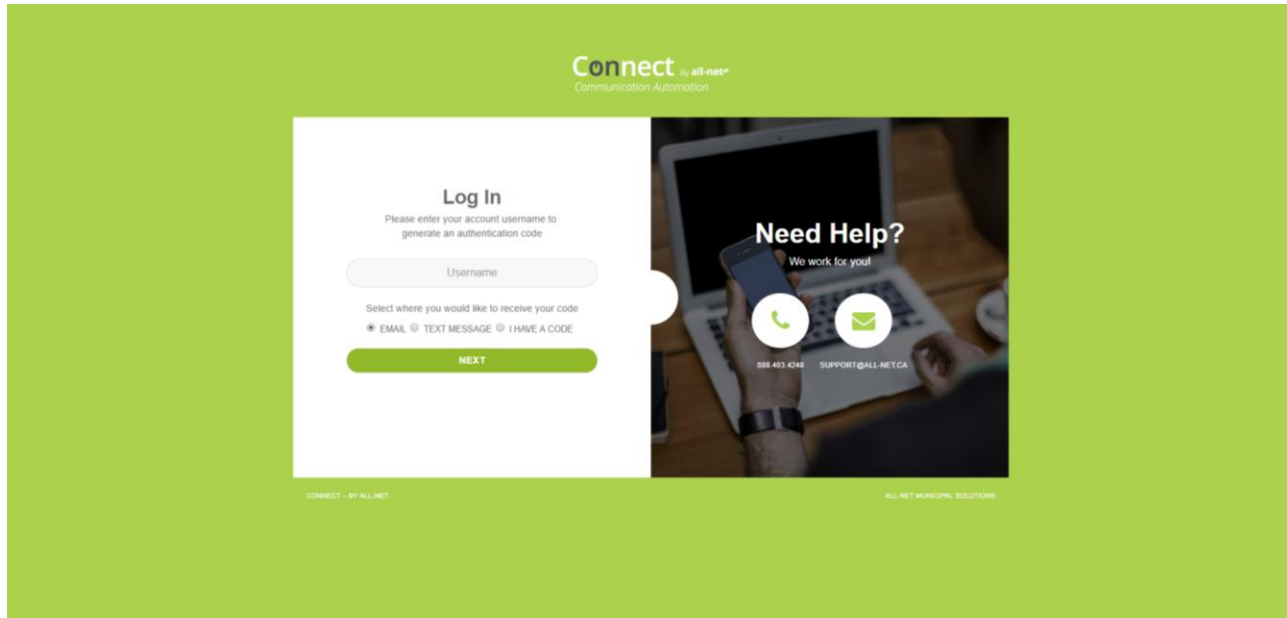


Your residents will have the ability to register and select their own communication preferences through a public management feature that can be integrated in to any website.

Your residents will have the ability to sign-up and select the types of information they would like to be aware of along with the devices they would like to be communicated on such as text, email, smartphones and land line phones.



MESSAGE TYPES



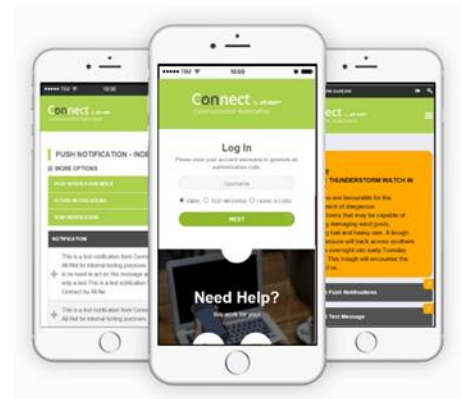
Your system administrator will have the ability to manage and administer the following:

- Create and manage user accounts for your residents
- Create and manage information topics/groups that residents can select and receive messages for.
- Create and manage internal topics/groups to send out internal messages.

MOBILE MANAGEMENT

The Connect portal provides you with the ability to manage and disseminate messages from any device including a smartphone.

The management portal is completely responsive to any mobile device and smartphone. This provides you with the ability to communicate with your residents from any location without the use of a desktop or laptop computer.





ADDITIONAL FEATURES

- Unlike the US, Canada has a national emergency alerting system (Alert Ready) to collect and disseminate all emergency alert messages across the country. Connect is powered by Alert Ready and we automatically send out your alerts to your residents.
- Unlike other services you own and have access to your registrant data. You can export all your data to an Excel file at any time.
- Connect uses proprietary software that continually communicates with Alert Ready to identify and send out alerts for your community.
- Alert Ready has been developed by the Government of Canada in partnership with each provincial and territorial government.
- Connect provides you with immediate alerts from the RCMP, Manitoba EMO and Environment Canada.
- Connect uses proprietary text to speech conversion to read out all alert messages. You do not need to record a message but do have that ability if needed.
- Connect is not just an emergency alert system. Connect has been developed for you to provide restricted and customized accounts for multiple staff where they can communicate with your residents on all municipal services 24/7. For example, public works staff can send out notifications for road closures and service outages and recreation staff can send out recreation information to residents who request it.
- Mobile communications can be sent to your residents by voice (Phone), text, push message and e-mail.
- Imminent danger for storms and tornados can be sent by phone from any location with a single click. You don't have to record or write the message as it comes direct to you from Alert Ready.
- Your data and resident registration information is not subject to the US patriot act as it is secured in a Canadian data centre.
- All pricing is in Canadian dollars.



EMERGENCY ALERTING

Canada has a National emergency alerting system and “Connect” is integrated with this system.

In 2017 All-Net launched a web service that continually communicates with Canada’s National Emergency Alert System (Alert Ready). Alert Ready has been developed in partnership with the federal and provincial governments to collect and disseminate all emergency alerts to Canadians.

Emergency alerts from the federal government, provincial governments, Environment and Climate Change Canada, RCMP and other officials are all handled through one system. Our web service communicates directly with Alert Ready to identify local emergency alerts and distributes these messages to each community. Local officials can now rest assure that the alert to imminent danger will be immediate and automated.

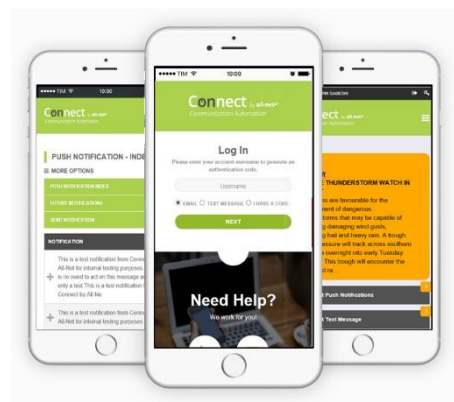
Residents can now receive automated alerts after hours and on weekends without the need for local officials to initiate a timely emergency alert.

Once an alert has been initiated, local officials have access to send out additional information to resident smartphones with follow-up messages and email.

Emergency alerting is a key feature of the Connect platform and smartphone app. The Connect app links up local municipal information and services to resident mobile devices.

Along with the announcement of imminent danger, the Connect portal provides municipal staff with a management portal to disseminate messages to residents on a wide array of mediums such as:

- Bulk/mass email
- SMS text messages
- Push messaging to smartphones
- Voice call messages to resident home phones
- Social media posts to Facebook and Twitter





ALERT TYPES

All alerts for your community issued by Federal and Provincial agencies automatically appear in your account.

The following types of alerts are automatically sent out to your resident's smartphones from Alert Ready:

- Amber Alert
- 911 Service
- Weather
- Tornado
- Flood
- Wildfire
- Hurricane
- Biological
- Chemical
- Falling Object
- Terrorist Threat
- Forest Fire
- Drinking Water Contamination
- Air Quality
- Civil Emergency
- Urban Fire
- Industrial Fire
- Earthquake
- Radiological
- Explosive
- Animal Danger

Access to Alert Ready is governed by the federal government is currently provided to:

- Federal government authorities
- Environment and Climate Change Canada
- The RCMP
- Municipal police agencies
- Provincial government officials
- Municipal officials as coordinated by each provincial government

NOTE: Municipal access to issue emergency alerts is governed and delegated by each provincial government. As a result, some municipal officials may have access to the ability to issue an emergency alert and others in another province may not.



DATA INTEGRATION

You own all your data and we do not hide behind privacy policies to prevent you from downloading your data.

We use a two-tiered approach to developing your local database of community contacts. Your account will come loaded with the phone directory for your community. This will include every publicly listed residential phone number available (White Page Listings).

We will then use our proprietary service to map out each resident to their physical mapped location via GPS coordinates. Where possible your residents will appear in your database with their home phone number and physical address.

We then walk you through a process to self-register residents, so they can provide you with additional cell phone number and e-mail addresses. When residents register, Connect will identify their existing listing and replace it as a new listing with all their current information.

You also have the ability to upload new registrants to your connect account in a batch process by simply using a formatted excel file to enter and upload your new data.

DATA OWNERSHIP

All data collected and added to your account is your property and you own all the data. We do not hide behind privacy policies to keep you from downloading and accessing your registrant data.

If you ever wish to download your account registrants, you can simply click one button and an Excel file will be generated for you to download.

We are also available to assist you in cleaning your data if necessary.

DATA MANAGEMENT

Your data is stored and backed up in Canada at a tier III data centre. Your data does not leave Canada and is not subject to the US Patriot act for data collection.



GETTING **STARTED**

STEP I

INFORMATION
GATHERING

STEP II

ACCOUNT SET-UP

STEP III

TRAINING AND
TUTORIALS

STEP IV

HOSTING AND
ONGOING SUPPORT

We walk with you through the entire process to get started and sending out your first message. Once you are up and running we are available 24/7 with support and assistance where required.

STEP I

- Gather information on client processes.
- Discuss and review the training process with your staff.

INFORMATION GATHERING

We begin the process on our end by becoming familiar with your current communication processes and procedures.

We identify communities in your region and begin to compile your initial resident contact list from public phone listings.



STEP II

- We create all your templates for you.
- Templates are based on your current practices.

ACCOUNT SET-UP

In this stage we create all your main account and user accounts so you can hit the ground running as soon as we begin training.

We will also pre-load your local resident database so you can review the mapping and location of each resident.

STEP III

- Small sessions
- We create your first message with you.
- Training provided by an experienced administrator.

TRAINING & TUTORIALS

Once your account is set we will walk you through the program and each individual feature.

At this stage you will be left with access to your account to send out test messages to your local working group. Once you are ready we will work with you to send out your first message to the public.

STEP IV

- Ongoing 24/7 support.
- Application updates.
- Training available for new staff
- Immediate access to updates and new features.
- Data backed up in Canada nightly.

HOSTING & ONGOING SUPPORT

Our services don't end after your first message. We continue to be here to assist you in any way of if you have any questions or new staff that require new training.

Your data is backed up nightly and we notify you when new features and updates are made available on your account.



STARTING **TIMELINE**

We will work with you on your own schedule to get you started. The set-up and training is very easy and requires very little time on your part.

Once we create your account and templates your training is provided over a one hour session.

Weeks	1	2	Ongoing
Information Gathering			
Account Set-up			
Training and Tutorials			
Hosting & Support			

ONGOING **SUPPORT**

We always have someone available 24/7 for after hour support and you do not pay for any additional support. We understand the importance of your communication needs and are always available with any assistance you may require.

We are available to provide training to new staff to ensure users have a great understanding of all the program features.

We are available 24/7 by phone or e-mail.

PRICE ESTIMATE

The following pricing includes:

- Account set-up and data migration
- Client Training
- Unlimited Messaging
- Public website sign-up form
- Data hosting and back-ups
- System updates
- White Page phone numbers
- GIS Mapping of phone numbers
- Community sign-up materials
- 24/7 client support
- Alert Ready access

2017/18 PRICING:

	YEAR ONE	ANNUAL RENEWAL
System Access Fee	3,995.00	3,995.00
Smartphone Apps (Optional)	995.00	495.00
Emergency Alerting (Optional)	995.00	495.00
Unlimited Text Messages / Year	0.00	0.00
Unlimited Voice Calls / Year	0.00	0.00
Unlimited E-mail	0.00	0.00
Local Phone Numbers	0.00	0.00
Cost	\$ 5,985.00	\$ 4,985.00
LGAA Discount	-500.00	-495.00
Total Cost	5,485.00	4,490.00

- The pricing above is based on a population under 10,000
- All prices above are in Canadian dollars.
- Includes 8 hours of data formatting time. Additional time priced at \$75/Hr.



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**COUNCIL REPORTS
AS OF JUNE 26, 2018**

		Meeting (since last council)
Agricultural Society	Cr. Klumph (Alt. Cr. Oswald)	_____
Barrhead Cares Coalition	Cr. Kluin	_____
Barrhead & District Social Housing Association	Cr. Penny	<u> X </u>
Barrhead Fire Services Committee	Cr. Assaf and Cr. Smith (Alt. Cr. Kluin)	_____
Barrhead Regional Airport Committee	Mayor McKenzie	_____
Barrhead Regional Water Commission	Mayor McKenzie and Cr. Smith	_____
Capital Region Assessment Services Commission	Cr. Penny	_____
Chamber of Commerce	Cr. Kluin	<u> X </u>
Community Futures Yellowhead East	Cr. Penny (Alt. Cr. Assaf)	_____
Economic Development Committee	Vacant	_____
Enhanced Policing School Resource Officer Committee	Cr. Oswald (Alt. Mayor McKenzie)	_____
Family & Community Support Services Society	Cr. Kluin and Cr. Penny	<u> X </u>
Library Board/Yellowhead Regional Library Board	Cr. Klumph	<u> X </u>
Municipal Planning Commission	Cr. Assaf, Cr. Klumph and Cr. Smith (Alt. Cr. Oswald)	_____
Regional Landfill Committee	Cr. Klumph and Cr. Penny	_____
Subdivision & Development Appeal Board	Cr. Penny	_____
Twinning Committee	Cr. Oswald	<u> X </u>



Date: June 20, 2018

To: Mayor McKenzie and Council

From: Martin Taylor, CAO

Re: CAO update

- Attended the CAMA and FCM conference they were both great learning experiences.
- Council will be viewing the web site on June 26th.
- Engineers finalizing tender for lagoon upgrade.
- Administration in final stages of preparing the information for the residents on the new waste pin and pick up process to begin in early July.
- The 50 avenue construction will be inconvenient for traffic and businesses.
- Summer programs registration underway.
- Administration reviewing the purchasing policy for council approval in July.
- The new lights in the curling rink will drastically improve candle power and reduce operating costs. The TSN sign will be installed this summer.
- Colliers International market study underway for the 14 acre property.

Respectfully submitted,
Martin Taylor, CLGM
CAO

A handwritten signature in black ink, appearing to read 'Martin Taylor', written over the typed name.



BARRHEAD PUBLIC WORKS DEPARTMENT

Monthly Report

Date: June 21, 2018

Last Month's Accomplishments:

- Received all 1700 – 65-gallon residential carts
- Two and a half days of clean up after the 2 day wind storm
- Excavated and repaired three sanitary sewer services
- Started retro fitting the Town's existing commercial garbage bins to work with the new truck
- Assisted with Street Festival – signs and barricades
- Repaired hydrant at Ford Dealership – back on line

Progress on Projects/Programs:

- Crack sealing on going
- Grayston Contractors started the underground work on 57 Avenue (storm sewer)
- Working with Summerville Construction on gas line deficiencies in lanes and paving
- Started on hydrant flushing
- Started on lane blading
- Started mowing on large grass areas

Budget Performance:

-

Outstanding Issues for the Month:


-

Next Month's Objectives:

- Assemble and distribute the new residential garbage carts
- Retro fitting old commercial garbage bins to fit new truck

Upcoming Special Events:

-


Submitted by: Brant Ross
Director of Public Works


CAO Martin Taylor

APPROVED*June 21/18*

**Barrhead & District Family & Community
Support Services Society
Regular Board Meeting May 17, 2018– 9:30 a.m.
Barrhead FCSS Building**

Finance Committee Meeting held at 9:00 a.m.

Present:

Randy Hindy, Chairperson
John Szwec, Secretary/Treasurer
Shelly Dewsnap, Executive Director
Debbie White, Recording Secretary
Jane Wakeford – Vice Chair
Sharen Veenstra
Ron Kleinfeldt
Bill Lane
Leslie Penny

Absent: Dausen Kluin, Marsha Smith, Vicki Kremp

1) Call to Order

The regular meeting of the Barrhead & District Family & Community Support Services Society was called to order at 9:34 a.m. by Randy Hindy

2) Acceptance of Agenda – Additions/Deletions

27-18 Moved by Bill Lane to accept the Agenda as presented. Motion seconded by Leslie Penny

Carried

3) Items for Approval

a) Minutes of the regular Board meeting of the Barrhead & District FCSS, April 19, 2018.

28 -18 Moved by Ron Kleinfeldt to accept the minutes of the Regular Board meeting of April 19, 2018, seconded by John Szwec

Carried

b) Financial Statements

29 -18 Moved by Bill Lane to accept the General Account, Community Account and Casino Account Financial Statements for the period ending April 30, 2018, as presented. The motion was seconded by Leslie Penny.

Carried

4) Staff Presentation: Daren Toivonen – Referral Family Counselor

Daren reported that mostly anxiety & complicated grief and clients who were witnesses to extreme violence. are what she is seeing. Daren and Monty are participating in "pet partners' out of the United States. They have been going to Keir Care to practice. In 2015 Daren had 112 referrals, 2016 167 referrals and 2017 191 referrals, numbers are always increasing. Daren uses the 'David Burns' method of counselling.

The Board thanked Daren for her presentation and dedicated service.

5) New Business**a) Board Elections**

30-18 CHAIR – Leslie Penny moved to nominate Randy Hindy, Randy accepted. Bill Lane moved that nominations cease, carried.
Randy Hindy remains Chair for the FCSS Board.

31-18 VICE CHAIR – Bill Lane moved to nominate Jane Wakeford, Jane accepted the nomination. Ron Kleinfeldt moved that nominations cease, carried.

Jane Wakeford remains Vice Chair for the FCSS Board.

32-18 SECRETARY/ TREASURER – Ron Kleinfeldt moved to nominate John Szwec, John accepted the nomination. Bill Lane moved that nominations cease, carried.

John Szwec remains Secretary/Treasurer for the FCSS Board.

b) Committee Selections**COMMITTEES:**

John Szwec will be Chair for the Policy & Procedures Committee.

Leslie Penny will be Chair for the Personnel Committee.

Ron Kleinfeldt will be on the Nomination Committee.

c) Board Declarations

Presented as information

d) Summer Schedule

33-18 Leslie Penny moved to close the FCSS office for the Fridays in July & August.
Motion seconded by Jane Wakeford.

Carried

6) Old Business**a) Van Update**

34-18 Leslie Penny moved to authorize Shelly to investigate the donation of a van from Stephani Motors and if costs bare out to accept the donation. Motion was seconded by John Szwec.

Carried

7) Items for Information**a) Director's Report****b) Staff Reports**

35-18 Moved by Bill Lane to accept the Directors and Staff Reports as presented.
Motion seconded by Ron Kleinfeldt.

Carried

c) Resolutions – Examples & Process

Presented as information

8) Board Development**a) FCSSAA Conference is November – 2 Board Representatives**

To be discussed at June 21, 2018 meeting. Hopefully we will have dates.

b) Date for review with Kendall Taylor

To be discussed at June 21, 2018 meeting. Shelly will call Kendall and see if October 18, 2018 afternoon works.

9) Next Meeting

Last Regular Meeting till fall: June 21, 2018

10) Adjournment

36-18 Motion to adjourn the meeting at 10:45 a.m. was made by Leslie Penny and seconded Bill Lane.

Carried

**Barrhead & District Family & Community Support Services Society Regular
Board Meeting of May 17, 2018.**



Chairperson



Recording Secretary

**BARRHEAD REGIONAL WATER COMMISSION
REGULAR MEETING MINUTES
June 12, 2018 – Town of Barrhead Council Chambers**

DRAFT

PRESENT

Chairman Dave McKenzie
Vice Chairman Doug Drozd
Director Don Smith
Director Brian Schulz
Director Bill Lane (via Facetime)

County of Barrhead Director of Finance and Administration Diane Begert
Commission Manager Mark Oberg

CALL TO ORDER

Chairman McKenzie called the meeting to order at 12:12 p.m.

AGENDA

Director Schulz moved approval of the Agenda as presented.

Carried

MINUTES

Director Schulz moved approval of the Minutes of the Regular Meeting held on March 29, 2018.

Carried

REPORTS

Chairman's Report

Chairman McKenzie had nothing to report since the meeting held on March 29, 2018.

Manager's Report

The written report from Commission Manager Oberg was reviewed. Mr. Oberg gave a status report on the projects to be worked on in 2018. Mr. Oberg also reported that the meetings of the Barrhead Regional Water Commission, being public meetings, will now be advertised at the Town of Barrhead and the County of Barrhead.

Director Lane moved approval of the Manager's Report

Carried

Commission Chairman

Commission Manager

**BARRHEAD REGIONAL WATER COMMISSION
REGULAR MEETING MINUTES
June 12, 2018 – Town of Barrhead Council Chambers**

DRAFT

Financial Report

Commission Manager Oberg reviewed the Financial Report.

Vice Chairman Drozd moved the Financial Report, which includes the Monthly Bank Reconciliation for April 30, 2018, the Outstanding Cheque List for April 30, 2018, and the Statement of Operations as of April 30, 2018.

Carried

COMMISSION MANAGER AUTHORIZATION TO APPROVE CONNECTIONS TO WATER PIPELINES

There was discussion on the matter of whether to authorize the Commission Manager to approve connections to water pipelines under the control of the Barrhead Regional Water Commission. This discussion concentrated on the differences in volume and system capacity when we are dealing with simple residential connections as opposed to connections such as commercial, industrial, multi-residential and agricultural.

Director Schulz moved to go into *in camera* at 12:30 to consider legal advice, as directed under Section 27 of the FOIP Act.

Carried

Director Schulz moved to go out of *in camera* at 12:35.

Carried

Vice Chairman Drozd moved to authorize the Commission Manager to authorize connections to water pipelines under the control of the Barrhead Regional Water Commission for single family residences; and to create for the next Regular Meeting a draft change to Bylaw 2, which would authorize the Commission to authorize connections to water pipelines under the control of the Barrhead Regional Water Commission for single family residences.

Carried

BOARD MEMBER REMUNERATION FOR EXTRA MEETINGS AND TRAINING SESSIONS

There was discussion on the matter of the regular meetings, extra meetings, and training sessions that Board Members attend to fulfill their responsibilities as Board Members. The 2018 Operations Budget currently has line items that correspond to some of the costs involved in these activities, but the Budget does not have a line item to deal with paying a per diem to the four locally elected members for these activities. It was noted that Section 4.7 of Bylaw 2 deals with the matter of Director remuneration.

Commission Chairman

Commission Manager

**BARRHEAD REGIONAL WATER COMMISSION
REGULAR MEETING MINUTES
June 12, 2018 – Town of Barrhead Council Chambers**

DRAFT

It was agreed that the matter of Director remuneration will be dealt with in the 2019 Operations Budget.

Director Schulz moved to authorize the reimbursement of travel expenses for the legal training session which was held at the Village of Clyde on March 5, 2018.

Carried

FUTURE TOPICS

Should the BRWC be involved in riparian health funding in order to affect the overall quality of raw water in the Paddle River?

Commission Manager Oberg reported that he has begun discussions with a representative of Cows and Fish, which is an organization whose focus is on riparian health in the Province of Alberta. Mr. Oberg anticipates bringing information on this matter to a future Regular Board Meeting.

NEXT MEETING

The next meeting will be held on September 11, 2018.

ADJOURNMENT

Director Lane moved adjournment at 12:55 p.m.

Carried

Commission Chairman

Commission Manager



REQUEST FOR DECISION

Date: June 26, 2018
To: Mayor McKenzie & Members of Council
From: Martin Taylor, CAO
Re: Bylaw 05-2018, Municipal Public Utilities Amendment Bylaw

Summary

Bylaw 05-2018, Municipal Public Utilities Amendment Bylaw

Overview

Bylaw 05-2018, the Municipal Public Utilities Amendment Bylaw, is presented for Council's review and approval.

Automated Waste Collection

The new Automated Waste Collection Truck has arrived and the waste collection carts and bins are being delivered.

The automated waste collection service will provide carts for front street, curb side pickup, creating efficiencies in the process. By moving to the front street there will be:

- less debris in the lanes from loose garbage, birds and animals tearing up bags
- fewer large trucks in the lanes, sanitation truck will be in the front street
- minimizing ruts left by the larger trucks
- less back lane maintenance for drainage, gravel
- providing a safer work environment for staff doing waste removal – minimize heavy lifting, and exposure to protruding sharp objects, chemicals/liquids in the bags

The new waste bins have lids and will also reduce debris from loose garbage, birds and animals tearing up bags, etc.

Regular maintenance of the carts and bins will be provided by the Town for normal and wear and tear. The new carts and bins are being provided at no cost to the landowner.

The new Automated Waste Collection process will be rolled out in two phases. Summarized as follows:

Phase 1 – Single Family Residential/Duplex Roll-Out

Phase 1 will take place during the week of July 9 – 13, 2018. During this phase, all single family residential/duplex properties will be provided with a black waste cart on their regular scheduled waste pick-up date. The schedule of delivery may vary, but the aim is to have the carts delivered on those dates.

Door hangers will be provided to all properties outlining the specifics for using the cart and contact details should they require more information. Any carts not delivered during this week will be delivered during the week of July 16 – 20, 2018. **The new automated garbage truck will be put into residential operational use beginning July 23, 2018.**

Each of these properties will be provided one waste cart and **all waste material must be placed in the cart** and moved to the front street for pickup. Property owners with a duplex will be supplied with two waste carts. The lids must be fully closed, with the arrows on the lid facing towards the street and wheels of the cart next to the curb. Any additional bags or materials outside of the waste cart will not be picked up.

The public has previously been advised that in order to reduce volumes for pickup that grass clippings, leaves, branches should be taken to the designated marked location east of the Fire Hall. Cardboard, newspaper, tin, plastics can be taken to the recycling location next to the Town Public Works shop or the Barrhead Regional Landfill.

Phase 2 – Multi-Residential & Commercial/Industrial/Institutional Roll-Out

Phase 2 will take place starting the beginning of August 2018.

For the multi-residential (three or more apartments or suites), commercial, industrial, institutional properties, waste carts/bins will be provided, or existing bins may be retrofitted. On an individual basis, owners or representatives of these properties will be contacted by the Town to determine whether carts, bins, size of bin should be supplied. This will be dependent on the area available on the site for the location of the bin or cart, accessibility for the truck for the pickup, anticipated volumes, etc.

As per the amendment bylaw, existing Bulk Waste Bins that were previously purchased from the Town that are in good condition may be retrofitted to Town specifications, with the costs being borne by the Town.

The existing Bulk Waste Bins that were previously purchased from the Town have an expected life span of 10 years. Each bin will be assessed to determine if it can be retrofitted for use by the new automated collection truck. If the bin is less than 10 years old, a rebate will be calculated on a pro-rated basis on the original purchase price, and the age and condition of the bins. The owner of the bin will be contacted to determine **if they want** to return it to the Town, or use it for their own purpose.

Only the new carts, bins or the bins that have been retrofitted will have the waste picked up. All waste material must be placed in the cart or bin. Any additional bags or materials outside of the cart or bin will not be picked up.

All carts/bins will be assigned a serial number unique to each property. All carts/bins are the responsibility of the property/land owner. Any replacements required, whether due to loss or damage, will be the responsibility of the property/land owner.

Summary

Waste Collection will remain on the scheduled days that are currently in effect. **The waste pickup days have not changed.** As this is a new system it will take some time to streamline the process and ask that the public be patient during this transition period. Questions or concerns the public will be directed to contact the Town Office.

Over the next few months the New Automated Waste Collection service will be monitored and may be subject to modifications in the future.

Attached are:

1. Bylaw 09-2017, Municipal Public Utilities Bylaw, Section IV Solid Waste Collection and Disposal (Item A).
2. Bylaw 05-2018, Municipal Public Utilities Amendment Bylaw (Item B).

Recommendations

Recommendation #1

That Council give Bylaw 05-2018, the Municipal Public Utilities Amendment Bylaw, all three readings.

Respectfully Submitted by:

Martin Taylor, CMC, CLGM
CAO

CURRENT BYLAW – WASTE COLLECTION SECTION

IV. Solid Waste Collection and Disposal Service

1.

That the rate for trade waste pick-up shall be at \$130.00 per hour with a minimum of \$65.00 per business per month. The rate will be pro-rated to the nearest quarter hour, based on the actual recorded time for pick-up and disposal.
2.

That the rate for residential solid waste pick-up shall be as per the following schedule:
- Single family residence

\$14.60/month

Duplex

\$14.60/month/suite

Any residential building with three or more suites

\$10.30/month/suite

Mobile Home Park:

(a)

where no bins are provided and stops are required for each or every second mobile unit

\$14.60/month/unit

(b)

where self unloading bins are provided

\$10.30/month/unit

3.

Commercial Light - where the pick-up is once a week, and 2 or less bags are picked up.

\$23.50/month

4.

Any building or business that does not fall into any of the classifications mentioned shall be

\$16.50/month

5.

Solid waste collection and disposal is also subject to the provisions of Bylaw 5-97, the Waste Collection, Disposal and Recycling Bylaw.

6.

Commercial garbage pickup bins are purchased from the Town of Barrhead or may be manufactured according to Town specifications. The bin Owner is responsible to ensure that the bins remain in a reasonable state of repair and are operationally useable and safe, as determined by the individual entrusted with the work of pickup or removal of waste on behalf of the Town of Barrhead. If deemed unusable, the Owner will be required to replace the garbage bin.

(a)

Pursuant to Bylaw 5-97, the Waste Collection, Disposal and Recycling Bylaw, commercial garbage bins must be in an approved location and provide free and clear access for waste removal.

(b)

Commercial garbage pickup bin sale price - \$ 950.00/bin

7.

No garbage bag shall, when presented for pick up, weigh more than 25 kg or 55 lbs. or within a reasonable limit thereof to be determined by that individual who is entrusted with the work of pickup or removal of waste on behalf of the Town of Barrhead.

8.

Garbage must be presented for pick up or removal in non returnable bags, and must be of a size and consistency of no greater capacity than 1.3 cubic yards (1 cubic meter) and not more than 76 cm (30 inches) in height and not more than 63 cm (25 inches) in width.

(a)

Where more than three individually tied grocery bags are used for garbage pickup or removal they must be placed in non-returnable bags subject to specifications noted in this bylaw.

(b)

Animal waste, feces or any other material which is emitted or is caused by the natural functioning of an animal, shall be placed in a separate garbage bag, double bagged and securely tied.
- 1

CURRENT BYLAW – WASTE COLLECTION SECTION

- (c) All clippings from trees, shrubs or other branch bearing flora shall be tied securely in bundles adhering to the aforementioned weight limitations for garbage bags and shall be presented as such. Nor shall these bundles exceed a length of approximately 1.2 meters (3.9 feet) and shall be judged by those entrusted with the pickup and removal of waste on behalf of the Town of Barrhead.
 - (d) Permitted, secure container shall mean any store bought, commercially manufactured garbage receptacle, or other container approved by the Town, for presentation of the non-returnable bags to be picked up. Non-permitted containers are 45 gallon/206 l drums, or any receptacle, wooden bin or box, that may pose a potential risk to the safety of staff picking up the garbage bags, or impede the efficiency of the pickup operations. The Town will determine if the garbage receptacle is deemed a “permitted secure container.”
 - (e) All bags shall be presented in a permitted, secure container, if left for removal or pickup more than 24 hrs. prior to the scheduled arrival of those who will lawfully remove that waste on behalf of the Town of Barrhead.
9. No person other than the Tenant, Owner, Town representative or garbage collection contractor shall interfere with, disturb the contents of, removal of or addition of materials, to any collection container at any eligible premises with the Town limits.

BYLAW 05-2018 **'ITEM B'**
Municipal Public Utilities Amendment Bylaw

A BY-LAW OF THE TOWN OF BARRHEAD, A MUNICIPAL CORPORATION IN THE PROVINCE OF ALBERTA, TO AMEND MUNICIPAL PUBLIC UTILITIES BYLAW 09-2017.

WHEREAS, pursuant to the provisions of the Municipal Government Act, being Chapter M-26, of the Revised Statutes of Alberta, 2000, and amendments thereto, the Council may pass Bylaws respecting to services provided by, or on behalf of the municipality; and,

WHEREAS, Council has deemed it necessary and desirable to amend Bylaw 09-2017, the Municipal Public Utilities Bylaw, for the addition of a municipal automated waste collection system.

NOW THEREFORE, duly assembled in a Regular Meeting, the Council of the Town of Barrhead, in the Province of Alberta hereby enacts as follows:

1. Bylaw No. 09-2017 is hereby amended.
2. **Section 1.1 DEFINITIONS** is amended by adding in the following subsections:
 - (i) “Automated Waste Collection” shall mean the collection of solid waste by a system of mechanical lifting and tipping of Carts or Bins into a specially designed vehicle.
 - (j) “Cart” shall mean a Town supplied wheeled receptacle that is intended for the automated collection of solid waste for residential dwellings and light commercial use.
 - (k) “Bin” shall mean a Town supplied large volume, bulk, solid waste container requiring mechanized collection for apartment, commercial, industrial and institutional use.
 - (l) “Bulk Waste Bin” shall mean a bulk solid waste container that was purchased from the Town prior to the year 2018 and used for the waste collection service as provided by the Town.
 - (m) “Landowner” shall mean the person, company or entity registered on the property title as per Alberta Land Titles
3. **Section IV. Solid Waste Collection and Disposal Service** subsections are amended, replaced, deleted or added as follows:
 1. Subsection 6 paragraph is replaced with: Solid waste collection Bins or Carts are supplied by the Town to each property. Existing Bulk Waste Bins that are in good condition will be retrofitted to the Town specifications, with the costs borne by the Town. The Landowner is responsible to ensure that the Bins or Carts remain in a reasonable state of repair and are operational and safe for use with the Automated Waste Collection system, as determined by the individual entrusted with the work of collection or removal of waste on behalf of the Town.

Municipal Public Utilities Amendment Bylaw

2. Subsection 6 (b) is replaced with: All existing Bulk Waste Bins previously purchased from the Town are given a 10 year life span from the original date of purchase.
3. Subsection 6 (c) is added as: Landowners with Bulk Waste Bins, purchased from the Town within the last 10 years, which are in good condition and can be retrofitted for use with the Automated Waste Collection system, will be rebated, on a prorated basis, a portion of the cost paid at the original time of purchase, with age and condition of the bin being considered, with such rebate being determined by the Town. After the retrofitting of the bin has taken place, and any rebate has been considered, the bin will become the property of the Town.
4. Subsection 6 (d) is added as: All residential property Landowners with a single family dwelling on the land will be supplied one (1) Cart for the Automated Waste Collection.
5. Subsection 6 (e) is added as: All residential property Landowners with a duplex on the land will be supplied with two (2) Carts for the automated waste collection. Residential property Landowners with three (3) or more suites/apartments will be contacted by the Town to ascertain whether Bins or Carts should be supplied, which will determined by the Town, based on location of Bin or Cart and volumes to be picked up.
6. Subsection 6 (f) is added as: Solid waste for commercial, industrial, institutional collection will be placed in the Town supplied Bin(s) or the retrofitted Bulk Waste Bin with the Landowner contacted by the Town to ascertain whether Bins or Carts should be supplied, which will determined by the Town, based on location of Bin or Cart and volumes to be picked up.
7. Subsection 6 (g) is added as: The Town supplied Carts and Bins are assigned a serial number unique to each property and stay with that property.
8. Subsection 8 paragraph is replaced with: All waste must be presented for collection or removal in the Town supplied Cart or Bin, or the retrofitted Bulk Waste Bin, in non returnable bags, and must be of a size and consistency of no greater capacity than 1.3 cubic yards (1 cubic meter) and not more than 76 cm (30 inches) in height and not more than 63 cm (25 inches) in width.
9. Subsection 8 (c) is amended by replacing "1.2" meters (3.9 feet)" with ".91 meter (3 feet)".
10. Subsection 8 (d) is replaced with: Solid waste presented for collection in the Town supplied Cart must fit within the Cart, with lid closed completely, be placed on the front street, with arrows on the lid pointed to the street, wheels against the curb, with at least one (1) meter clearance around all sides of the Cart. Dependant on locations and varying circumstances the Town may designate an alternate area for collection. Any bags or waste outside of the Cart will not be picked up.
11. Subsection 8 (e) is replaced with: All Carts must be removed from the street by 11:00 p.m. on collection day and stored on the Landowners property.

BYLAW 05-2018 **'ITEM B'**
Municipal Public Utilities Amendment Bylaw

12. Subsection 8 (f) is added as: Solid waste presented for collection in the Town supplied Bin, must have the lid closed completely. Waste presented for collection in a retrofitted Bulk Waste Bin must be placed within the bin. Any bags or waste outside any Bins will not be picked up.
13. Subsection 10 is added as: The Town shall supply the 1st Cart(s) or Bin(s) to each property. Any replacement of a Cart or Bin, due to loss or significant damage, with the exception of normal wear and tear, shall be the responsibility of the property Owner at a cost of:
- (a) 65 gallon Cart - \$ 100.00
 - (b) 95 gallon Cart - \$ 125.00
 - (c) 4 yard Bin - \$ 1,100.00
 - (d) 6 yard Bin - \$ 1,300.00

4. That this By-Law once passed and signed shall form part of By-Law 09-2017, the Municipal Public Utilities Bylaw.
5. That this By-Law shall take effect on the day of the final passing thereof.
6. It is the intention of Council that each separate provision of this Bylaw shall be deemed independent of all other provisions herein and it is further the intention of Council that should any provisions of this Bylaw be declared invalid, all other provisions thereof shall remain valid and enforceable.

Read a first time this _____ day of _____, 2018.

TOWN OF BARRHEAD

Mayor, Dave McKenzie

Martin Taylor, CAO

Read a second time this _____ day of _____, 2018.

TOWN OF BARRHEAD

Mayor, Dave McKenzie

Martin Taylor, CAO

Read a third time this _____ day of _____, 2018 and passed.

TOWN OF BARRHEAD

Mayor, Dave McKenzie

Martin Taylor, CAO



REQUEST FOR DECISIONS

Date: June 26, 2018
To: Mayor McKenzie & Members of Council
From: Martin Taylor, CAO
Re: Information Items

Summary

Information Items for Council's review.

Overview

The following information items were presented:

- 2017 Annual Environmental Monitoring Report for the Swan Hills Treatment Centre
- Federation of Canadian Municipalities (FCM) Special Advocacy Fund
- Alberta Development Officers Week Proclamation September 24 to September 28, 2018
- Yellowhead Regional Library Board Meeting – March 5, 2018

Recommendations

Recommendation #1

That Council accept as information.

Respectfully Submitted by:

Martin Taylor, CMC, CLGM
CAO



SUEZ North America
Recycling and Waste Recovery
Swan Hills Treatment Centre
Bag 1500
Swan Hills, AB T0G 2C0 Canada
Phone: 780 333-4197
Fax: 780 333-4196

May 17, 2018

RECEIVED
MAY 28 2018

Town of Barrhead
5014 – 50 Avenue
Box 4189
Barrhead AB T7N 1A2

Attention: Mayor David McKenzie

Dear Sir:

Please find enclosed one copy of the 2017 Annual Environmental Monitoring Report for the Swan Hills Treatment Centre.

If you have any questions or require additional information, please contact the undersigned at (780) 333-4197, extension 1229.

Sincerely,

SUEZ North America

A handwritten signature in black ink, appearing to read "Louisa Ramsey", with a long, sweeping horizontal stroke extending to the right.

Louisa Ramsey
Environmental Supervisor



SWAN HILLS TREATMENT CENTRE

2017 Environmental Monitoring Results Annual Report

Executive Summary

Prepared by:
SUEZ Canada Waste Services Inc.

March 2018

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1 INTRODUCTION

The Swan Hills Treatment Centre (SHTC) (Figure 1-1) provides comprehensive treatment and disposal capabilities for hazardous wastes. The SHTC is owned by the Alberta Government and was operated in 2017 by SUEZ Canada Waste Services (SUEZ) under an operating contract with Alberta Infrastructure.

The SHTC is located approximately 17 kilometers northeast of the Town of Swan Hills, as shown in Figure 1-2.



Figure 1-1: Swan Hills Treatment Centre

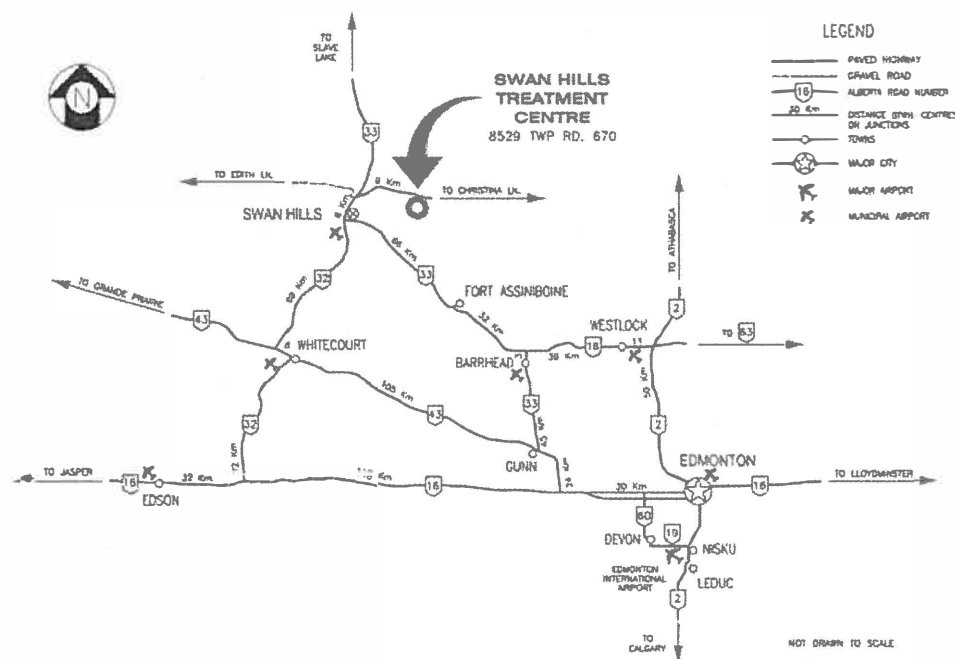


Figure 1-2: Site Location Map

A thorough environmental baseline data collection program was initiated around the SHTC in 1985. This program has evolved into an extensive environmental monitoring program that provides early detection of potential environmental impacts associated with SHTC operations. The program includes the monitoring of meteorology, air quality, soils, vegetation, ground water, surface water, sediment, fish, and wildlife. A toxicological assessment of wildlife and fish monitoring results is also performed annually.

The monitoring program results are reviewed annually with regulatory authorities and regional stakeholders, and changes are made to the program's scope and methodology, as required, to maintain its effectiveness. Specific monitoring program "triggers", introduced in 2001, were continued in 2017. These triggers were established to identify suspected trends in contaminant levels and provide early response through collection of additional monitoring data, if warranted.

The environmental monitoring program was rationalized in 2000 to concentrate on a subset of the historic monitoring plots. Although the number of plots was reduced in selected monitoring components, more detailed analyses have been conducted at these sites. Along with this change, a commitment was made to expand the program on a 5-year basis to include the historic monitoring plots. Expanded monitoring was first conducted in 2004, then again implemented in 2009 and 2014; the next expanded program will be conducted in 2019. In addition, a series of program "triggers" was established that require expanded monitoring if trigger conditions are exceeded.

The following provides a summary of the environmental monitoring program results for 2017. The report includes an overview of SHTC operations, monitoring program scope for each component, any changes that were implemented for the 2017 monitoring year, and a summary of the results. Detailed findings are presented in the Annual Report and supporting technical data are assembled in separate appendix volumes.

The final section of the Executive Summary describes the proposed scope for the 2018 environmental monitoring program including the recommended component-specific "triggers". Exceedance of trigger conditions will initiate additional monitoring work in 2018, or during the subsequent monitoring period, as outlined.

2 OPERATIONS

The Swan Hills Treatment Centre employs a variety of processes to treat hazardous waste. These include the following:

Incineration: The FBD Incinerator is the primary process unit with a capability of treating approximately 35,000 tonnes per year.

Physical/Chemical Treatment: Inorganic liquid wastes are treated through a variety of processes including neutralization, oxidation, reduction, phase separation and precipitation in the physical/chemical treatment plant.

Stabilization: The Stabilization plant treats heavy metal contaminated fly ash from the FBD Incinerator, by immobilizing the hazardous constituents in a cement-like matrix. The end product is an inert, non-hazardous solid.

The non-hazardous residues resulting from treatment are disposed on-site in secure landfills (solid residues) or in the disposal well (liquid residues).

2.1 2017 Operations

The Swan Hills Treatment Centre has treated over 446,000 tonnes of hazardous waste since commencing operations in 1987 (Figure 2-1). In 2017, approximately 16,300 tonnes of hazardous waste were treated including:

- 3,500 tonnes of Fuel Blend Liquid;
- 1,600 tonnes of Paint Related Materials;
- 1,400 tonnes of Non-Halogenated Organic Liquid;
- 894 tonnes of Biomedical Waste;
- 650 tonnes of Pesticides;
- 600 tonnes of Halogenated Organic Liquid;
- 509 tonnes of PCB contaminated materials;
- 67 tonnes of Ozone Depleting Substances (ODS).

Other waste streams included pharmaceuticals, bulk solids, gas plant filters, inorganic aqueous liquids, and lab packs.

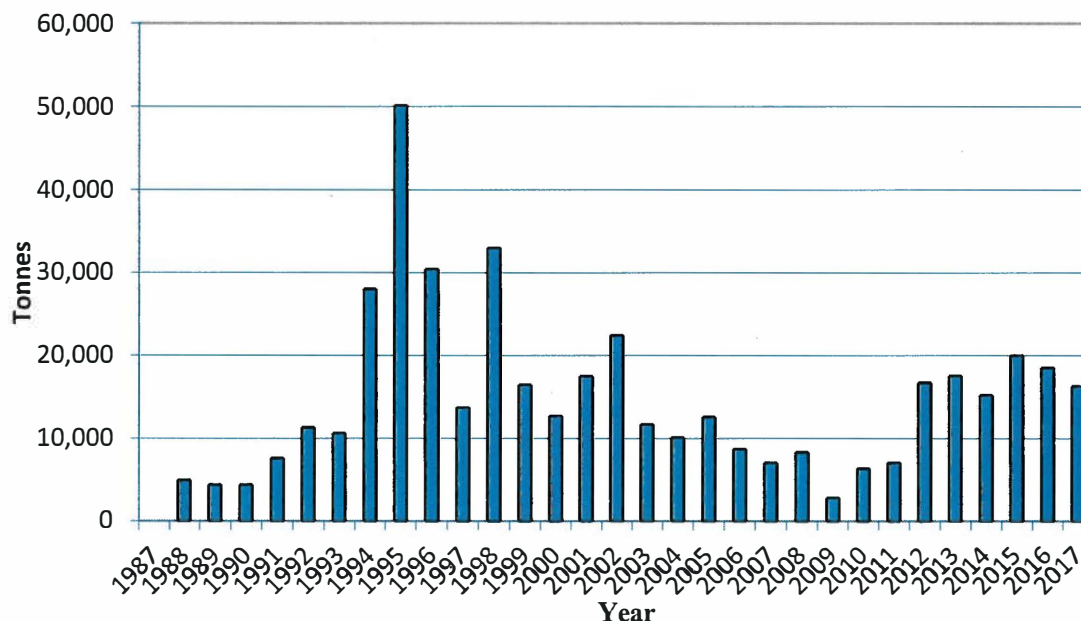


Figure 2-1: Waste Treatment Summary

Significant events and achievements in 2017 included the following:

- The FBD Incinerator was operational for approximately 7308 hours between January 1 and December 31, 2017.
- On October 27, 2017 Approval 1744 was extended to November 1, 2018 by Alberta Environment and Parks.
- On October 27, 2017 the Letter of Authorization for Biomedical Waste Processing at a feed rate of 4,200 kg/hr was extended to November 1, 2018 by Alberta Environment and Parks.
- The FBD Incinerator demonstrated excellent Destruction and Removal Efficiency (DRE), exceeding 99.9999% in 2017. Dioxin and Furan (PCDD/F) Toxic Equivalency (TEQ) emissions were analyzed twice in 2017. Once from February 14-16, 2017 as part of the authorization to process biomedical waste and once from September 26-28, 2017 as part of the Approval required Source Emissions Survey. Sampling carried out February 14-16 as part of the biomedical waste processing, had average PCDD/F TEQ results of 5.28 pg/m³, approximately 7% the approved emission limit of 80 pg/m³. The annual hazardous waste compliance test was completed on

September 26-28. The average PCDD/F TEQ results of 15.9 pg/m³ was well below the performance requirements (approved emission limit of 140 pg/m³ and a performance target of 80 pg/m³). Although both tests significantly exceeded performance requirements SUEZ continued to investigate opportunities to improve the performance of the FBD incinerator's PCDD/F emission control system in 2017.

- There was a scheduled maintenance shut-down of the FBD Incinerator in June. Equipment repair and maintenance items were addressed and routine inspections were conducted on all process equipment. Key maintenance items included:
 - Refractory replacement (rings 9-46)
 - Saturator repairs
 - Drum lift overhaul
 - Replacement of the rails at the Deslagger loadout
 - Installation of agitators in the organic feed tanks
- The aqueous receiving tanks were replaced.
- An energy audit of the plant was completed.
- Site lighting improvements were started.
- New baghouse bags were installed.
- A shale bin was purchased to improve separation of solids and liquids when processing material from onsite projects.
- There was a significant amount of rainfall in 2017 requiring two off-site discharges of excess runoff from South Pond #2 in compliance with Approval requirements. A third discharge could not be performed, because dissolved molybdenum was above the discharge limit.

3 METEOROLOGY & AIR QUALITY

3.1 Scope

Meteorological data is collected continuously at the Air Quality Monitoring (AQM) Station (Site 11) located southeast of the SHTC as shown in Figure 3-1. Meteorological parameters include hourly average values for ambient temperatures at 2 m and 10 m heights, relative humidity, net solar radiation, vertical temperature gradients, wind velocity and direction at 10 m and 30 m heights and vertical turbulence at 30 m. Observations were also made for total precipitation.

An ongoing air monitoring program is conducted at the SHTC in compliance with Operating Approval 1744. The program consists of monitoring PCB levels in ambient air at five locations, total suspended particulate (TSP) at two locations, and total hydrocarbons (THC) and volatile organic compounds (VOCs) at one location, as shown in Figure 3-2. One sampling site (E1) is located within the waste processing area, while the others are along the fenceline of the facility, or near the property boundary (Site 11). Ambient PCB and TSP levels are obtained monthly and THC and VOC monitoring at the Organic Tank Farm (OTF) is conducted annually.

A Leak Detection and Correction Program is also conducted annually at the OTF to survey process equipment, identify any leaking components and initiate repairs in order to minimize fugitive emissions. The program also provides the data necessary to estimate fugitive VOC and PCB mass emissions associated with OTF operations.

Stack exhausts from buildings equipped with air management systems are monitored for PCBs and THC. These include the Decant Building, Heated Storage Building and the FBD Incinerator Feed and Container Staging buildings.

3.2 Summary of Results

3.2.1 Meteorology

The overall ambient temperature remained within the historical range in 2017. The average monthly temperature recorded at the AQM Station ranged between -8.5°C and 14.9°C at 2m, and -8.3°C and 15.2°C at 10m. The one-hour maximum, average and minimum temperatures recorded in 2017 at the AQM Station were 28.1°C , 2.2°C and -36.5°C at 2m, and 27.6°C , 2.5°C and -33.7°C at 10m respectively. (SUEZ 2018¹)

The total annual precipitation in 2017 was 723.5 mm, which was less than 2016. The reading is the second highest on record and is higher than amounts recorded by other weather stations in the area (Goose Mountain was the highest at 699.4 mm). The AQM precipitation equipment was replaced April 11, 2017.

¹ SUEZ, 2018. "2017 SHTC Meteorological Report", SUEZ Canada Waste Services, Swan Hills, AB, 29 pp

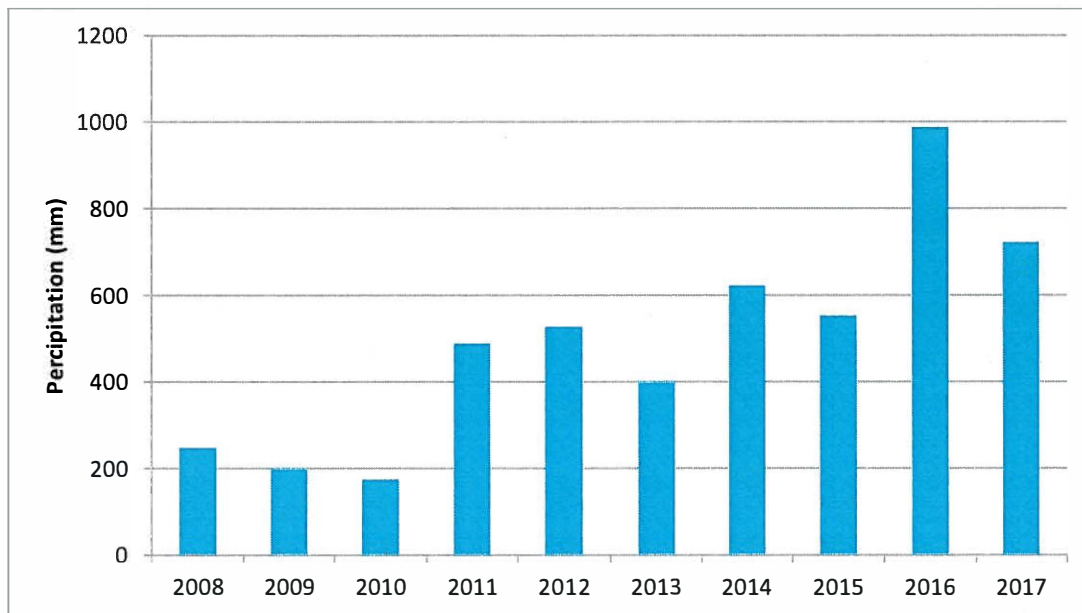


Figure 3-1: Total Annual Precipitation

The predominant wind direction in 2017 was from the west-northwest, west, northwest, and west-southwest and southwest at both 10m and 30m which is typical for the Swan Hills region. Average wind speeds at the 10 m and 30 m levels were 13.3 km/hr and 18.5 km/hr respectively, which are similar to observations from previous years. (SUEZ 2018¹)

The barometric pressure remained within the historical range from January to March 2017, and then dropped when the weather station equipment was replaced. The average monthly barometric pressure recorded at the AQM Station ranged between 664.3 mmHg and 754.9 mmHg. The one-hour maximum, average and minimum barometric pressure recorded in 2017 at the AQM Station were 768.0 mmHg, 692.2 mmHg and 650.0 mmHg, respectively.

The overall relative humidity remained within the historical range in 2017. The average monthly relative humidity recorded at the AQM Station ranged between 57.2 % and 80.5 %. The one-hour maximum, average and minimum relative humidity recorded in 2017 at the AQM Station were 99.0 %, 68.0 % and 13.0 %, respectively.

The meteorological monitoring instrumentation was fully operational in 2017, with an average annual operating efficiency for all parameters of >98%.

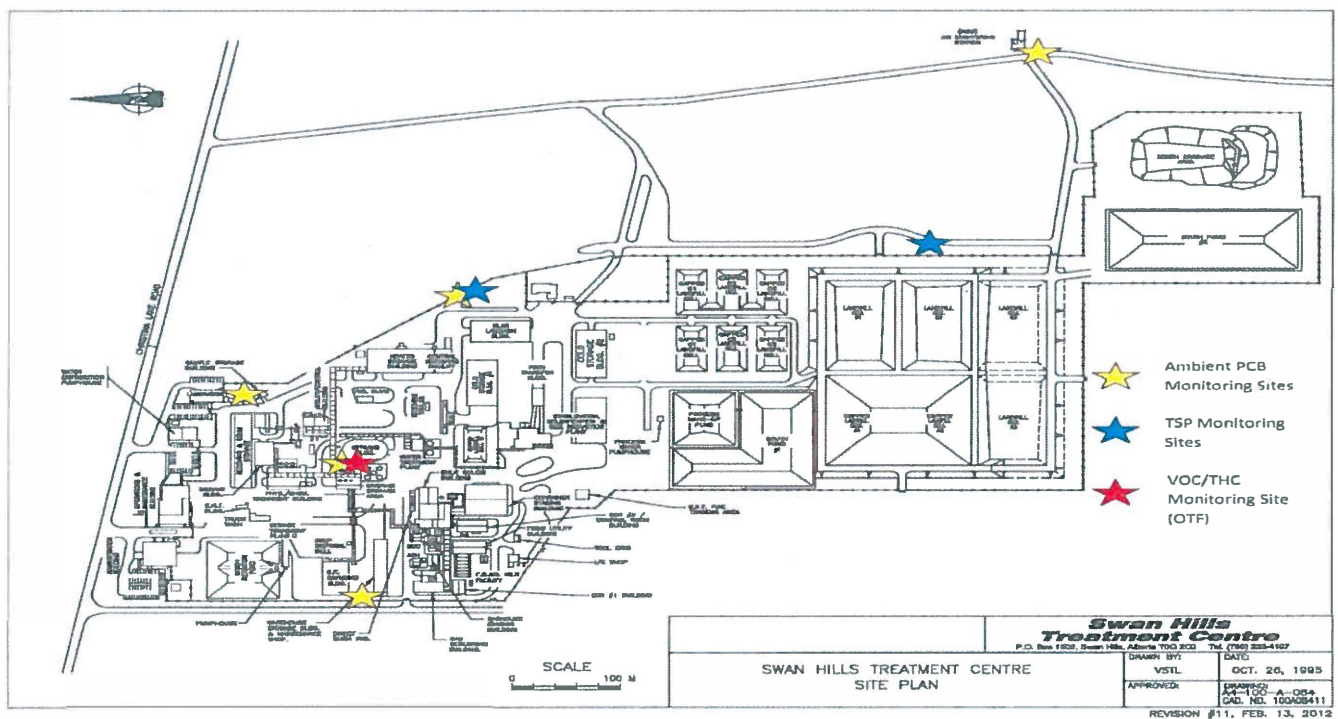


Figure 3-2: SHTC Site Plan Locations of Air Monitoring Stations

3.2.2 Air Monitoring Results

Polychlorinated biphenyls (PCBs) sampling was conducted monthly with 100% data completeness in 2017. Ambient air PCB monitoring results at the SHTC for the period 2006-2017 are presented in Figure 3-3. Results are summarized below. Note that direct comparison with previous monitoring data may not be appropriate due to the reduced sampling frequency that was implemented in 2006. A lower detection limit was also introduced in 2006, based on a method revalidation.

The following observations were noted:

Ambient PCB Aroclor levels in 2017 were lower than those measured in 2016. The overall average fenceline PCB concentration (the average of sites 1, 2A and 5A) in 2017 was 1.22 ng/m³ compared to 2.90 ng/m³ in 2016.

Individual site average PCB concentrations decreased at all sites compared to 2016 averages. The average PCB concentration decreased by 1.25 ng/m³ at Site 1, 2.26 ng/m³ at Site 2A, 1.52 ng/m³ at Site 5A, 0.58 ng/m³ at Site 11, and 37.1 ng/m³ at Site EI compared to 2016 (Figure 3-3).

Ambient PCB levels were lowest at Site 11 (New AQM). The average 24-hour concentration was 0.93 ng/m³ and the maximum 24-hour level reported was 1.13 ng/m³.

Consistent with previous observations, PCB levels tended to be higher during the warm summer months. The highest 24-hour concentration (33.3 ng/m³) was measured at the OTF (Site EI) on June 6, 2017.

All 24-hour PCB measurements on plant site were well below the Occupational Health and Safety limit of 500,000 ng/m³ (Aroclor 1254). No exceedances of SUEZ's fenceline trigger level of 150 ng/m³ were observed in 2017.

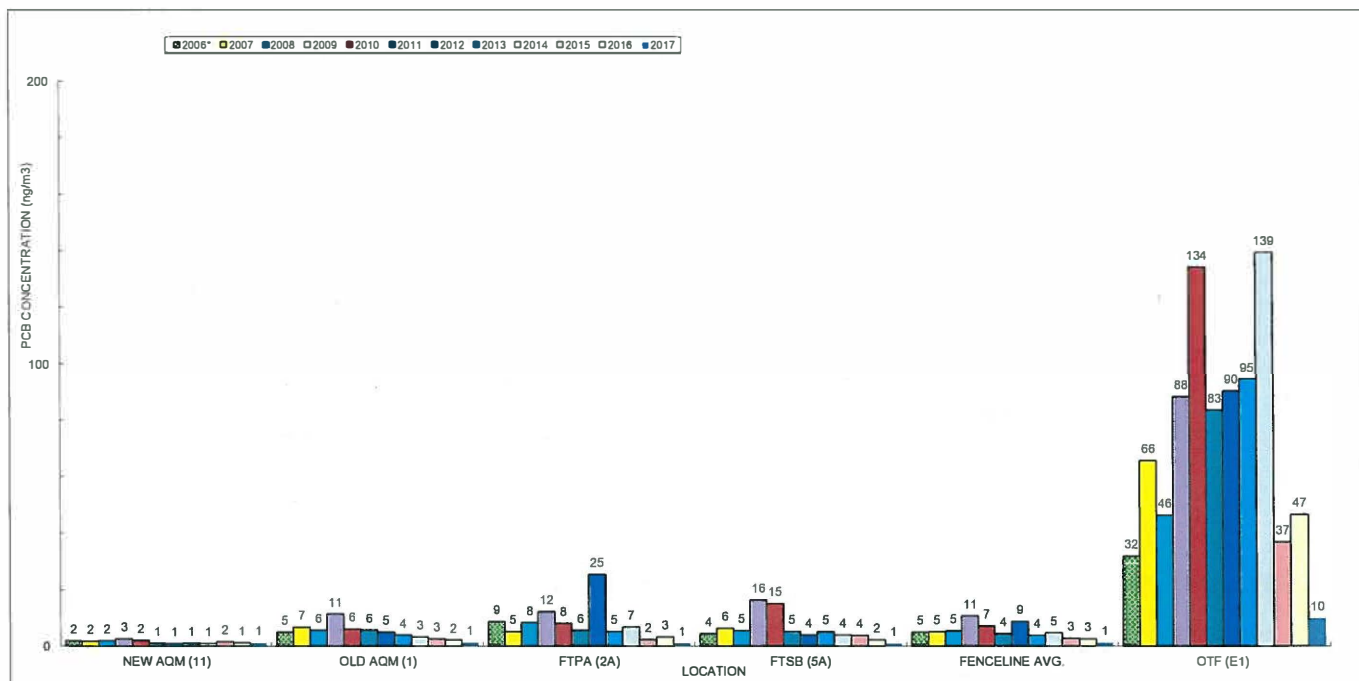


Figure 3-3: SHTC PCB Fugitive Emissions 2006 - 2017

*The sampling frequency in 2006 was reduced to monthly from once per 6 days in 2005. Also, the detection limit was reduced in April 2006 upon method revalidation.

Total Suspended Particulate (TSP) sampling was conducted at two sites (Site 1 and Site 9, Figure 3-2) on the same monthly schedule as PCBs. No exceedances of the Alberta Environment Air Monitoring Directive 24-hour TSP ambient air quality objective of $100 \mu\text{g}/\text{m}^3$ were measured at Site 1 or Site 9. The highest result was at Site 1 on October 3, 2017 ($47 \mu\text{g}/\text{m}^3$) when removing asphalt on plant site for the paving project.

Volatile Organic Compounds (VOC) and Total Hydrocarbons (THC) sampling was conducted at the Organic Tank Farm (Site E1) on July 19, 2017. The total VOC and THC concentrations are presented in Table 3-1. There are no Approval limits for these parameters however; both VOC and THC were below the monitoring program “trigger” values of 3 ppm and 5 ppm, respectively.

Table 3-1: VOC and THC Results at Site E1 (2017)

Date	Average Temperature (°C)	Total VOC Concentration (ppm)	Total THC Concentration (ppm)
Trigger Limit	-	3	5
19-Jul-17	16.1	0.017	2.10

The 2017 SHTC Organic Tank Farm (OTF) Leak Detection and Correction Program was conducted in accordance with the Operating Approval and the “Swan Hills Treatment Centre Organic Tank Farm Fugitive Emissions Leak Detection and Correction Program” (Earth Tech 2006²). In 2017 there were no components that exceeded the federal leak guideline (i.e. a VOC concentration greater than 10,000 ppm) (CCME 1993³), therefore the leak frequency in 2017 was 0% (SUEZ 2018⁴).

² Earth Tech (Canada) Inc. 2006. “Swan Hills Treatment Centre Organic Tank Farm Fugitive Emissions Leak Detection and Correction Program.” Swan Hills, AB: Earth Tech (Canada) Inc. 14 pp.

³ CCME. 1993. “Environmental Cods of Practice for the Measurement and Control of Fugitive VOC Emissions From EquipmentLeaks.” Winnipeg, MB: Canadian Council of Ministers of the Environment Secretariat. 44 pp.

The total estimated mass VOC emissions for 2017 from the OTF and associated equipment was 17.9 kg, of which 0.67 kg was determined to be PCBs (SUEZ 2018⁴). This is within the historical range for both the VOC and PCB fugitive emission estimates. The OTF Leak Detection and Correction Program will be continued in 2018. Note that the variation in emissions between years is attributed primarily to variations in the VOC and PCB concentration in liquids processed at the SHTC at the time samples are obtained. The concentrations are used in combination with leak detection results to calculate the estimated emission rates presented in Table 3-2.

Table 3-2: Comparisons of estimated VOC and PCB emissions from fugitive equipment leaks in the Organic Tank Farm area in 2017 to values from previous years.

Year	VOCs		PCBs	
	kg/y	g/h	kg/y	g/h
2017	17.93	2.04	0.67	0.08
2016	17.92	2.05	<0.01	<0.10
2015	12.40	1.42	0.85	0.10
2014	18.73	2.14	4.76	0.54
2013	22.13	2.53	0.11	0.01
2012	28.88	3.30	0.10	0.01
2011	30.46	3.48	3.99	0.46
2010	22.16	2.53	8.72	1.00
2009	13.20	1.51	6.81	0.78
2008	6.73	0.77	0.91	0.10
2007	34.97	3.99	1.38	0.16
2006	34.91	3.99	4.23	0.48
2005	3.90	0.45	0.21	0.02
2004	47.19	5.37	6.01	0.68
2003	8.17	0.93	0.40	0.05
2002	17.53	2.00	0.49	0.06

The monthly monitoring of the activated carbon air management system exhaust stacks is also conducted to evaluate the performance of the fugitive emission control systems. One carbon change-outs was performed in 2017 on the FBD Building Carbon Adsorber (CAU) as a precautionary measure when the THC levels started to rise.

⁴ SUEZ Canada Waste Services. 2018. "Swan Hills Treatment Centre 2017 Organic Tank Farm Fugitive Emissions Leak Detection & Correction Program Annual Report." Swan Hills, AB: SUEZ Canada Waste Services Inc: 66 pp.

The Air Monitoring Directive requires that the Air Monitoring System and Quality Assurance Manual be audited every three years. This was completed by Global Analyzer Systems Ltd. on November 8, 2017.

3.3 Air-Related Complaints

As per Section 4.1.35 (b) of Operating Approval 1744, the SHTC did not receive any air-related complaints in 2017.

3.4 Dioxins and Furans (PCDD/F) Study

One of the requirements of Approval 1744 is to achieve improved emission performance for dioxins and furans consistent with the Canada-Wide Standards (CWS) program. As per Section 4.1.34 (g) of the Approval, SUEZ is continuing to investigate a number of options to provide more consistent control of dioxin and furan emissions associated with incinerator operation. It should be noted that the FBD Incinerator was designed with a state-of-the-art pollution control system that has demonstrated a very high level of performance and consistently meets the Approval requirements.

Earth Tech submitted the results of its dioxin and furan study to Alberta Environment on December 12, 2007 and SUEZ continues to pursue the control options outlined in the report. One of the options involved moving the injection point for powdered activated carbon (PAC) upstream of the baghouse and evaluating any performance gains achieved by this design change. In 2009, PAC injection was flow-tested at different locations upstream of the baghouse. However, inconsistent flow at the injection points was observed and additional investigation was required to determine if this is a viable control strategy.

In response to the abnormal PCDD/F TEQ results observed in 2012 and 2013 SUEZ re-examined the injection of PAC upstream of the baghouse and evaluated the impact on PCDD/F emission control in 2014. The results can be found in the 2013 and 2014 Annual Reports to AEP.

3.5 Summary of Dioxin and Furan Emissions in 2017

As per Section 4.1.35 (f) of the Operating Approval, the following is a summary of the dioxin and furan emissions from the FBD Incinerator, based on stack compliance tests performed in 2017.

Testing was conducted on February 14-16, 2017, at the FBD Incinerator, to evaluate performance while processing biomedical waste. This test was completed with the FBD Incinerator operating under normal conditions with the activated carbon introduced as per normal operation. As shown in Table 3-3, the average dioxin and furan toxic equivalent (PCDD/F TEQ) result was 5.3 pg/m³ and meets the emission limit for biomedical waste processing (80 pg/m³) outlined in the October 30, 2016 Letter of Authorization

Table 3-3: Dioxin and Furan TEQ Results (February 14-16, 2107)

	Test Run #1 14-Feb-17 12:20 to 15:30	Test Run #2 15-Feb-17 10:50 to 14:05	Test Run #3 16-Feb-17 10:45 to 14:05	Average
Total 2378 Toxic Equivalent (pg/m ³ , dry @ 11% O ₂)	9.8141	4.1096	1.9320	5.2852
Approval Limit (pg/m ³ , dry @ 11% O ₂)				80

The 2017 regulatory stack compliance test was completed on the FBD Incinerator September 26-28, 2017. This test was completed with the FBD Incinerator operating under normal conditions with the activated carbon introduced as per normal operation. The average PCDD/F TEQ measured (Table 3-4) was 15.9 pg/m³ and meets both the emission limit (140 pg/m³) and the performance target (80 pg/m³) outlined in Section 4.1.20 of the Approval.

Table 3-4: Dioxin and Furan TEQ Results (September 26-27, 2017)

	Test Run #1 26-Sep-17 15:15 to 18:20	Test Run #2 27-Sep-17 10:20 to 13:25	Test Run #3 27-Sep-17 14:10 to 17:15	Average
Total 2378 Toxic Equivalent (pg/m ³ , dry @ 11% O ₂)	2.17	6.22	39.22	15.87
Approval Limit (pg/m ³ , dry @ 11% O ₂)				140

3.6 Summary of Emergency Vent Cap Openings

The previous operator (Earth Tech) completed a Vent Cap study as required by Section 4.1.39 of Operating Approval 1744 and submitted the report to Alberta Environment on December 12, 2007. SUEZ continues to operate following the recommendations coming from the 2007 study and investigates each vent cap opening to determine the root cause. When possible, appropriate controls and operational strategies are developed to minimize recurrence. This approach has been successful to date and has resulted in a significant decrease in the number of vent cap episodes in recent years.

Two emergency vent cap openings occurred in 2017; both were associated with power outages that were beyond the control of SUEZ. All incidents were reported to AEP and investigated.

The emergency vent cap is a safety device that prevents hot combustion gases from damaging the pollution control system in the event an emergency shut-down is required. An emergency shut-down is a controlled event that terminates waste feeds prior to implementing a sequence of steps (including vent cap openings) to ensure worker safety and equipment integrity is protected. There were no observed environmental impacts resulting from the above vent cap openings, as demonstrated by the results of the 2017 environmental monitoring program.

3.7 Stack Emissions Monitoring

The FBD Incinerator stack is equipped with a Continuous Emissions Monitoring System (CEMS) capable of monitoring Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO₂), Carbon Dioxide (CO₂), Oxygen (O₂), Carbon Monoxide (CO), Total Hydrocarbons (THC), Hydrogen Chloride (HCl), volumetric flow and temperature as required by Section 4.1.25 of Operating Approval 1744, and the “Continuous Emission Monitoring System (CEMS) Code” (AEP 1998⁵). The SHTC also maintains a Quality Assurance Manual for the CEMS, as required by the CEMS Code. The intent of the Manual is to ensure the SHTC’s compliance with the CEMS Code and the Operating Approval, and to provide a means for effective measurement, recording and reporting of stack gas parameters.

The eICIS data acquisition and control system for the CEMS was upgraded in June 2017.

The CEMS Code requires that two Relative Accuracy Test Audits (RATAs) and two Cylinder Gas Audits (CGAs) are performed per year on the CEMS. The first RATA was successfully completed March 3, 2017 and the second RATA was successfully completed October 12, 2017. Both RATAs were performed by Emissions Test Group. The first CGA was successfully completed on April 17, 2017 and the second CGA was successfully completed on June 2, 2017. Both CGAs were performed by SHTC staff.

The CEMS Code also requires that the CEMS and Quality Assurance Manual be audited on an annual basis. In 2017, this audit was completed on November 9 by Global Analyzer Systems Ltd.

Section 4.1.28 of the Operating Approval requires that manual surveys of stack emissions be conducted annually to determine concentrations and emission rates for various parameters. Tables 3-5 provides a summary of results of the manual stack surveys.

⁵ Alberta Environmental Protection. 1998. “Continuous Emissions Monitoring System (CEMS) Code.” Edmonton, AB: Alberta Environmental Protection. 48 pp.

Table 3-5: 2017 Manual Stack Survey Results

Parameter	Operating Approval Limit	February 16-18, 2017 Result ⁶	September 26-28, 2017 Result ⁷
DRE ^{1,3} (for PCB)	99.9999% for regulatory compliance test only		>99.9999%
Total Particulate	20 mg/m ³	2.92 mg/m ³	7.08 mg/m ³
PCDD/F TEQ ^{2,3}	80 pg/m ³ for biomedical waste processing only	5.28 pg/m ³	
	140 pg/m ³ for regulatory compliance test		15.9 pg/m ³
Mercury	20 µg/m ³ for biomedical waste processing only	2.92 µg/m ³	
HCl	75 mg/m ³	<0.0336 mg/m ³	<0.0373 mg/m ³
SO ₂	325 mg/m ³	0.280 mg/m ³	1.11 mg/m ³
CO	57 mg/m ³	<4.31 mg/m ³	<5.00 mg/m ³

¹ DRE – Destruction Removal Efficiency

² PCDD/F TEQ – Dioxin/Furan Toxic Equivalent

³ When analytical results were less than the Method Detection Limit (MDL), the MDL was used to calculate concentrations and emission results

⁶ Maxxam, 2017. Source Emissions Survey SUEZ Canada Waste Services Inc. Swan Hills Treatment Centre, Alberta FBD Incinerator Stack Approval #1744 Project # 17-201." Maxxam Analytics 172 pp.

⁷ Maxxam, 2017. Source Emissions Survey SUEZ Canada Waste Services Inc. Swan Hills Treatment Centre, Alberta FBD Incinerator Stack Approval #1744 Project # 17-2244." Maxxam Analytics 176 pp.

4 SOILS & VEGETATION

4.1 Scope

The objectives of the 2017 monitoring program were to assess changes in concentrations of chemicals of concern in the area surrounding the SHTC. This program was completed in accordance with Section 4.8 of the facility's Environmental Protection and Enhancement Act Approval No. 00001744 02 01, as amended.

- More specifically, the scope in 2017 was limited to the following:
 - Assessing changes in chemical concentrations within ten annual monitoring plots by collecting vegetation samples and comparing the analytical results to those of previous sampling events.
 - Samples of live moss and Labrador tea leaves were collected from each plot and analyzed for inorganic and organic parameters. The purpose of this sampling is to monitor trends in contaminant levels in the terrestrial environment to assess impacts associated with the operation of the SHTC.
 - Assessing alternatives to the current moss bag sampling protocol for measuring metal deposition near the SHTC.

The location of monitoring plots is shown in Figure 4-1. Plots 70 and 71 are reference sites located approximately 12 kilometers west of the facility near the Town of Swan Hills and 25 kilometers north along Highway 33, respectively.

Live moss samples were collected at the ends and mid-point of a 30 m linear transect established in each monitoring plot. For each subsample, a piece of live moss was cut using a stainless steel trowel and then ripped by hand and homogenized in a large plastic bag. Labrador tea leaves (larger, previous growing season's leaves) were collected near the monitoring plots. Following homogenization in the field, portions of the live moss and Labrador tea were placed in glass jars (organic) or plastic bags (inorganic) for analysis.

Samples of live moss and Labrador tea leaves are analyzed for inorganic parameters, including metals, nutrients, pH, and electrical conductivity and organic parameters, including polychlorinated biphenyls (PCBs), dioxins (PCDD), and furans (PCDF).

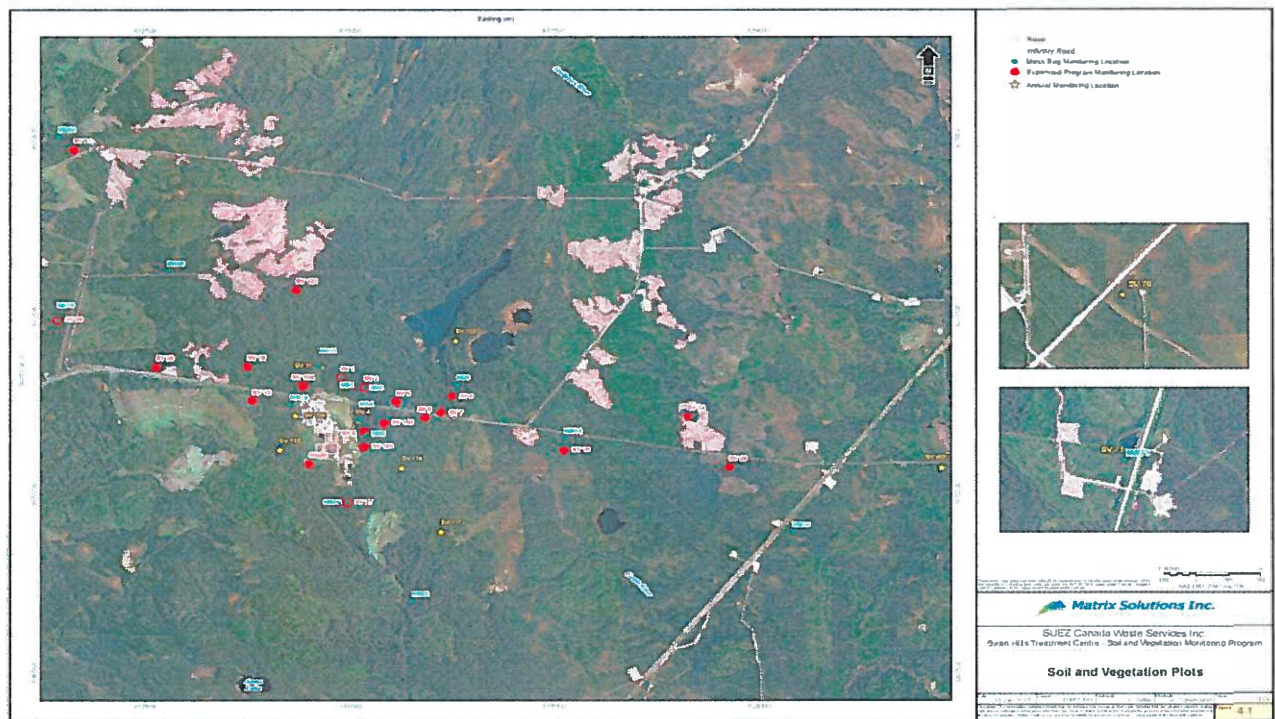


Figure 4-1: Location of Soil and Vegetation Monitoring Sites

4.2 Results and Conclusions

Overall the monitoring program indicates that emissions from the facility have caused certain metals and polychlorinated compounds to accumulate in the surrounding terrestrial environment but there is no evidence to indicate that these chemicals continue to accumulate.

The following summarizes the results of the 2017 monitoring program. Additional data is provided in the 2017 soil and vegetation monitoring program report. Tables are provided summarizing polychlorinated biphenyl (PCB) and dioxin (PCDF) and furan (PCDF) results in soil (Tables 4-1 to 4-3) and Labrador tea (Table 4-4 to 4-6). Graphs have been included illustrating spatial and temporal trends of PCBs (Figures 4-2 to 4-5).

4.2.1 Live Moss

The following summarizes the results for inorganic parameters in 2017:

- All parameters analyzed in the live moss met the Tier 1 natural area guidelines.
- Spatially cadmium, copper, lead, and molybdenum concentrations in the live moss are greatest at plots 4, 109, and 114. There is no evidence that concentrations of these metal parameters are increasing at these plots.
- Arsenic concentrations at plots 4, 11, 109, 114, 117, and 123 increased by more than 40% when compared to 2016. However, only the concentrations at plots 4, 114, and 402 exceeded the 75th percentile of the historical distribution of arsenic concentrations. There is no evidence of an increasing trend in arsenic concentrations at plots 4, 114, and 402, and further monitoring is required to confirm if the increase in arsenic concentrations at these plots is anomalous or related to emissions from the SHTC.

The following summarizes the results for organic parameters in 2017:

- PCB, PCDD/PCDF, and toxic equivalence (TEQ) values were elevated at plots near the SHTC (4, 11, 109, and 114).
- Concentrations of PCDD/PCDF were within historical ranges and there are no increasing trends.
- Co-planar PCBs represented a significant proportion of the total TEQ value in those plots situated near the SHTC (plot 4, 11, 109, and 114).

- PCB and PCB TEQ concentrations increased in the moss at most monitoring plots in 2017 relative to 2016 levels; however, concentrations in the moss were within historical ranges, and there is no obvious long term trend in PCB concentrations. PCB concentrations in the moss have fluctuated over time; however, the cause of this fluctuation is uncertain.

TABLE 4-1

Live Moss Quality Results - PCDD/PCDF, PCB, and TEQ¹

SUEZ Canada Waste Services Inc.
W ½ 06-067-08 W5M

Sample Point	Sample Date	PCBs mg/kg	PCDD/PCDF TEQ ng TEQ /kg	PCB TEQ ng TEQ/kg	Total TEQ ng TEQ/kg
Live Moss					
Plot 4	31-May-17	0.88	26.70	105.00	131.70
Plot 11	1-Jun-17	0.074	7.65	9.23	16.88
Plot 70	1-Jun-17	0.00014	0.27	0.03	0.30
Plot 71	1-Jun-17	0.00029	0.21	0.05	0.26
Plot 109	31-May-17	0.51	28.50	53.00	81.50
Plot 110	31-May-17	0.017	3.13	1.85	4.98
Plot 114	31-May-17	0.064	3.43	6.04	9.47
Plot 117	31-May-17	0.036	2.36	3.80	6.16
Plot 123	31-May-17	0.0048	0.53	0.53	1.06
Plot 402	31-May-17	0.0013	0.21	0.13	0.35

Notes:

¹ - a value equal to ½ the detection limit was used for all non-detected congeners to calculate sample TEQ.

TABLE 4-2

Historical Moss Quality Results - PCB Concentration (Congeners) - mg/kg

SUEZ Canada Waste Services Inc.

W ½ 06-067-08 W5M

Date	Plot 4	Plot 11	Plot 70	Plot 71	Plot 109	Plot 110	Plot 114	Plot 117	Plot 123	Plot 402
May-06	1.9	0.11	0.0021	0.0012	0.36	0.042	0.21	0.058	0.014	0.0053
Jun-07	0.77	0.17	0.0017	0.0012	0.27	0.027	0.69	0.045	0.011	0.0023
May-08	0.96	0.14	0.0013	0.004	0.5	0.037	0.097	0.033	0.015	0.0064
Jun-08	0.96	0.14	0.0013	0.004	0.5	0.037	0.097	0.033	0.015	0.0064
Jun-09	1.05	0.065	0.0013	0.00085	0.27	0.020	0.19	0.037	0.011	0.0020
Jul-09	0.86	0.093	0.024	0.0025	0.47	0.032	0.22	0.051	0.015	0.0057
May-10	1.95	0.19	0.0020	0.0023	0.60	0.066	0.35	0.070	0.010	0.0027
May-11	1.73	0.19	0.0036	0.0017	0.76	0.052	0.50	0.137	0.024	0.0039
Jun-12	1.62	0.17	0.00077	ND	0.61	0.034	0.24	0.035	0.0035	0.0011
Jun-13	1.98	0.14	0.0031	0.0022	0.72	0.038	0.38	0.100	0.020	0.0068
May-14	0.34	0.017	0.00096	0.00023	0.24	0.0063	0.087	0.013	0.00055	0.00068
Jun-15	0.98	0.12	0.00051	0.00095	0.54	0.015	0.17	0.066	0.011	0.0019
May-16	0.44	0.026	0.00013	0.00014	0.16	0.0046	0.13	0.016	0.0040	0.00068
Jun-17	0.88	0.074	0.00014	0.00029	0.51	0.017	0.06	0.036	0.0048	0.00130

TABLE 4-3

Historical Moss Quality Results - PCB TEQ - ng TEQ/kg¹

SUEZ Canada Waste Services Inc

W ½ 06-067-08 W5M

Date	Plot 4	Plot 11	Plot 70	Plot 71	Plot 109	Plot 110	Plot 114	Plot 117	Plot 123	Plot 402
May-06	198.99	21.36	0.02	ND	47.11	4.84	29.82	8.46	1.89	0.06
Jun-07	120.73	20.34	0.01	0.01	40.5	0.44	44.42	7.03	1.67	0.04
May-08	122.8	23.31	1.69	1.49	63.75	5.3	12.69	6.01	3.34	1.52
Jun-08	131.22	23.57	1.49	1.21	67.18	5.1	13.35	5.81	2.88	1.31
Jun-09	170.41	12.4	0.09	ND	46.16	3.44	23.44	6.70	2.05	0.01
Jul-09	94.36	9.81	0.01	ND	46.78	2.65	20.94	4.61	1.33	0.21
May-10	131.89	22.36	0.01	0.01	56.08	5.17	30.65	6.76	1.15	0.39
May-11	128	20.3	0.01	ND	50.30	3.85	35.60	10.30	1.83	0.38
Jun-12	192	23.80	0.01	ND	55.7	5.22	24.50	0.19	0.04	1.33
Jun-13	216	19.4	0.01	0.01	82.00	3.67	32.80	10.2	3.01	0.02
May-14	46.8	2.33	0.0029	0.00040	24.00	0.72	10.20	0.045	0.0020	0.0019
Jun-15	112	17.9	0.16	0.23	49.00	1.74	19.00	5.86	1.28	0.236
May-16	43.5	3.05	0.06	0.03	14.80	0.44	8.95	1.44	0.46	0.078
Jun-17	105	9.23	0.03	0.05	53.00	1.85	6.04	3.8	0.53	0.13

Notes:

ND - results reported as zero in lab report

¹ - a value equal to ½ the detection limit was used for all non-detected congeners to calculate sample TEQ. Prior to 2014 a value of zero was used for all non-detected congeners

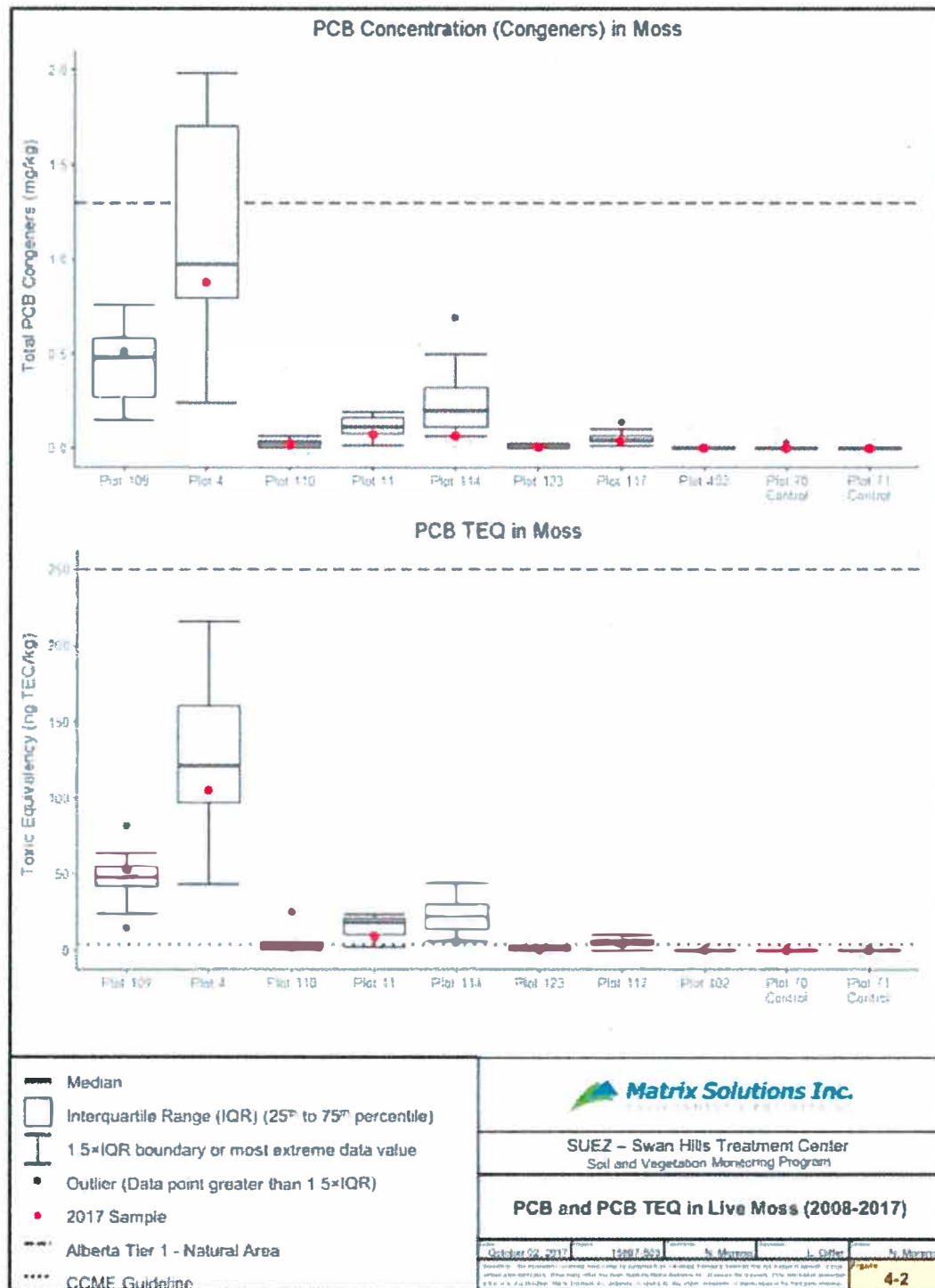


Figure 4-2: PCB and PCB TEQ in Live Moss

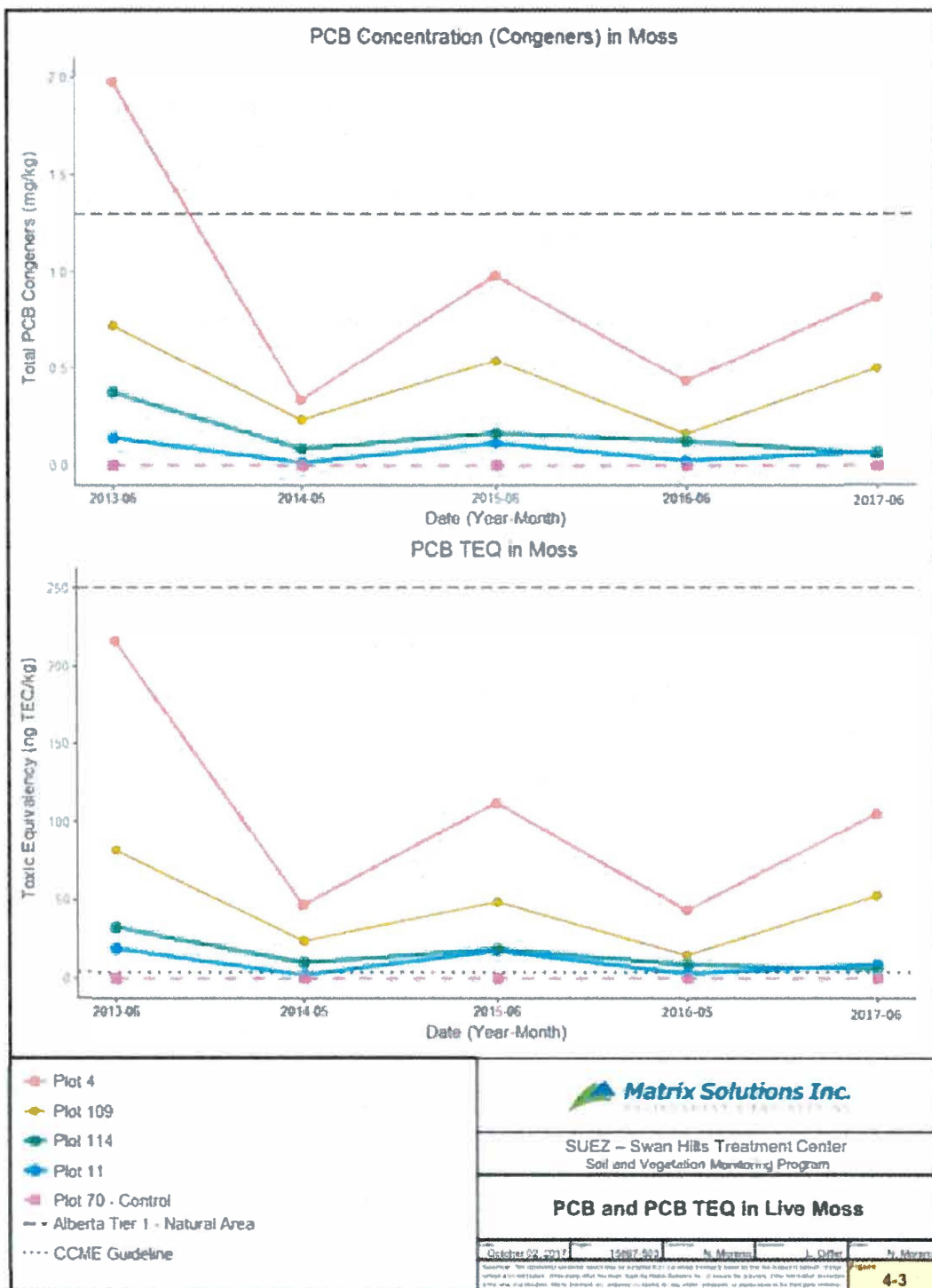


Figure 4-3: PCB and PCB TEQ in Live Moss

4.2.2 *Labrador Tea Leaves*

The following summarizes the results for inorganic parameters in 2017:

- Metal concentrations were within historical ranges with the exception of arsenic concentrations in the Labrador tea at plots 4, 109, 110, and 114. The concentrations of arsenic at in those plots increased significantly relative to the previous year. Arsenic concentrations at plots 4 and 109 were also elevated relative to historic values. Further sampling is required to confirm if this increase is representative of a trend.
- With the exception of arsenic, metal parameters at those plots situated near the SHTC were not noticeably elevated relative to background levels.

The following summarizes the results for organic parameters in 2017:

- Concentrations of PCBs and TEQ values were elevated at plots near the SHTC (plots 4, 11, 109, and 114).
- Overall, TEQ levels in Labrador tea at plots near the SHTC are lower than levels observed in the live moss. Co-planar PCBs represented a significant proportion of the total TEQ value in those plots situated near the SHTC (plots 4, 11, 109, and 114).
- PCB, PCB TEQ, and PCDD/PCDF TEQ values were within historical ranges and there are no increasing trends in these parameters over time.
- PCB concentrations in Labrador tea leaves near the SHTC (plots 4, 11, 109, and 114) are decreasing. The overall TEQ value is also decreasing at plots 4 and 109. This is likely indicative of a decrease in the rate of atmospheric PCB deposition at these plots.

TABLE 4-4

Labrador Tea Quality Results - PCDD/PCDF, PCB, and TEQ¹

SUEZ Canada Waste Services Inc.

W ½ 06-067-08 W5M

Sample Point	Sample Date	PCBs mg/kg	PCDD/PCDF TEQ ng TEQ/kg	PCB TEQ ng TEQ/kg	Total TEQ ng TEQ/kg
Labrador Tea Leaves					
Plot 4	31-May-17	0.103	1.01	14.10	15.11
Plot 11	1-Jun-17	0.00762	0.49	1.04	1.53
Plot 70	1-Jun-17	0.000142	0.35	0.02	0.38
Plot 71	1-Jun-17	0.000162	0.38	0.02	0.40
Plot 109	31-May-17	0.0731	0.92	7.47	8.39
Plot 110	31-May-17	0.00346	0.89	0.39	1.28
Plot 114	31-May-17	0.0173	1.85	2.13	3.98
Plot 117	31-May-17	0.00517	0.75	0.70	1.45
Plot 123	31-May-17	0.00124	0.56	0.17	0.73
Plot 402	31-May-17	0.000409	1.51	0.07	1.58

Notes:

¹ - a value equal to ½ the detection limit was used for all non-detected congeners to calculate sample TEQ.

TABLE 4-5

Historical Labrador Tea Quality Results - PCB Concentration (Congeners) - mg/kg

SUEZ Canada Waste Services Inc.

W ½ 06-067-08 W5M

Date	Plot 4	Plot 11	Plot 70	Plot 71	Plot 109	Plot 110	Plot 114	Plot 117	Plot 123	Plot 402
May-06	0.15	0.025	0.0034	0.0028	0.076	0.0080	0.060	0.013	0.0050	0.0029
Jun-07	0.23	0.093	0.014	0.026	0.13	0.036	0.10	0.039	0.021	0.020
May-08	0.30	0.025	0.0035	0.010	0.15	0.013	0.075	0.021	0.0089	0.010
Jun-08	0.30	0.025	0.0035	0.010	0.15	0.013	0.075	0.021	0.0089	0.010
Jun-09	0.24	0.020	0.0038	0.00093	0.052	0.0077	0.069	0.014	0.0050	0.0029
Jul-09	0.22	0.049	0.0028	0.027	0.42	0.015	0.075	0.012	0.0081	0.012
May-10	0.52	0.067	0.0057	0.0028	0.41	0.015	0.21	0.035	0.0084	0.0040
May-11	0.25	0.046	0.0026	0.00089	0.24	0.024	0.12	0.021	0.0039	0.0015
Jun-12	0.44	0.021	0.0057	0.00022	0.17	0.0023	0.052	0.0055	0.0012	ND
Jun-13	0.30	0.023	0.0020	0.0022	0.21	0.013	0.052	0.011	0.0026	0.0027
May-14	0.19	0.024	0.00024	0.00018	0.10	0.0072	0.037	0.0059	0.0020	0.00076
Jun-15	0.19	0.020	0.00028	0.00010	0.11	0.0062	0.041	0.0053	0.0013	0.00064
May-16	0.13	0.011	0.00015	0.00009	0.049	0.0027	0.021	0.0073	0.0017	0.00049
Jun-17	0.10	0.008	0.00014	0.00016	0.073	0.0035	0.017	0.0052	0.0012	0.00041

TABLE 4-6

Historical Labrador Tea Quality Results - PCB TEQ - ng TEQ/kg¹

SUEZ Canada Waste Services Inc.

W ½ 06-067-08 W5M

Date	Plot 4	Plot 11	Plot 70	Plot 71	Plot 109	Plot 110	Plot 114	Plot 117	Plot 123	Plot 402
May-06	39.20	0.44	0.010	ND	9.45	0.11	8.13	0.18	0.030	0.010
Jun-07	34.00	4.63	0.040	0.030	10.29	0.20	10.44	0.27	0.080	0.10
May-08	29.78	2.24	0.010	0.020	11.06	0.91	7.35	1.61	0.20	0.010
Jun-08	33.51	2.52	0.020	0.070	12.45	1.04	8.23	1.83	0.27	0.020
Jun-09	30.39	3.12	0.010	ND	4.84	0.40	6.51	1.22	0.010	0.010
Jul-09	7.83	0.11	ND	0.010	12.49	0.040	3.62	0.030	0.020	0.010
May-10	43.57	7.78	0.020	0.010	30.51	0.060	18.80	2.95	0.55	0.010
May-11	27.80	3.87	0.010	ND	18.70	3.90	10.20	2.41	0.020	0.010
Jun-12	64.00	0.19	0.320	ND	0.95	0.040	0.34	0.060	0.010	ND
Jun-13	41.70	3.41	ND	ND	23.80	0.060	6.49	0.060	0.010	0.010
May-14	26.70	3.58	0.158	0.112	11.50	0.816	4.71	0.36	0.22	0.43
Jun-15	21.20	2.55	0.113	0.099	13.30	0.873	5.12	0.68	0.23	0.16
May-16	17.00	1.45	0.0137	0.0367	5.97	0.321	2.41	0.68	0.074	0.042
Jun-17	14.10	1.04	0.0232	0.0227	7.47	0.387	2.13	0.70	0.173	0.065

Notes

ND - results reported as zero in lab report

¹ - a value equal to ½ the detection limit was used for all non-detected congeners

to calculate sample TEQ. Prior to 2014 a value of zero was used for all non-detected congeners.

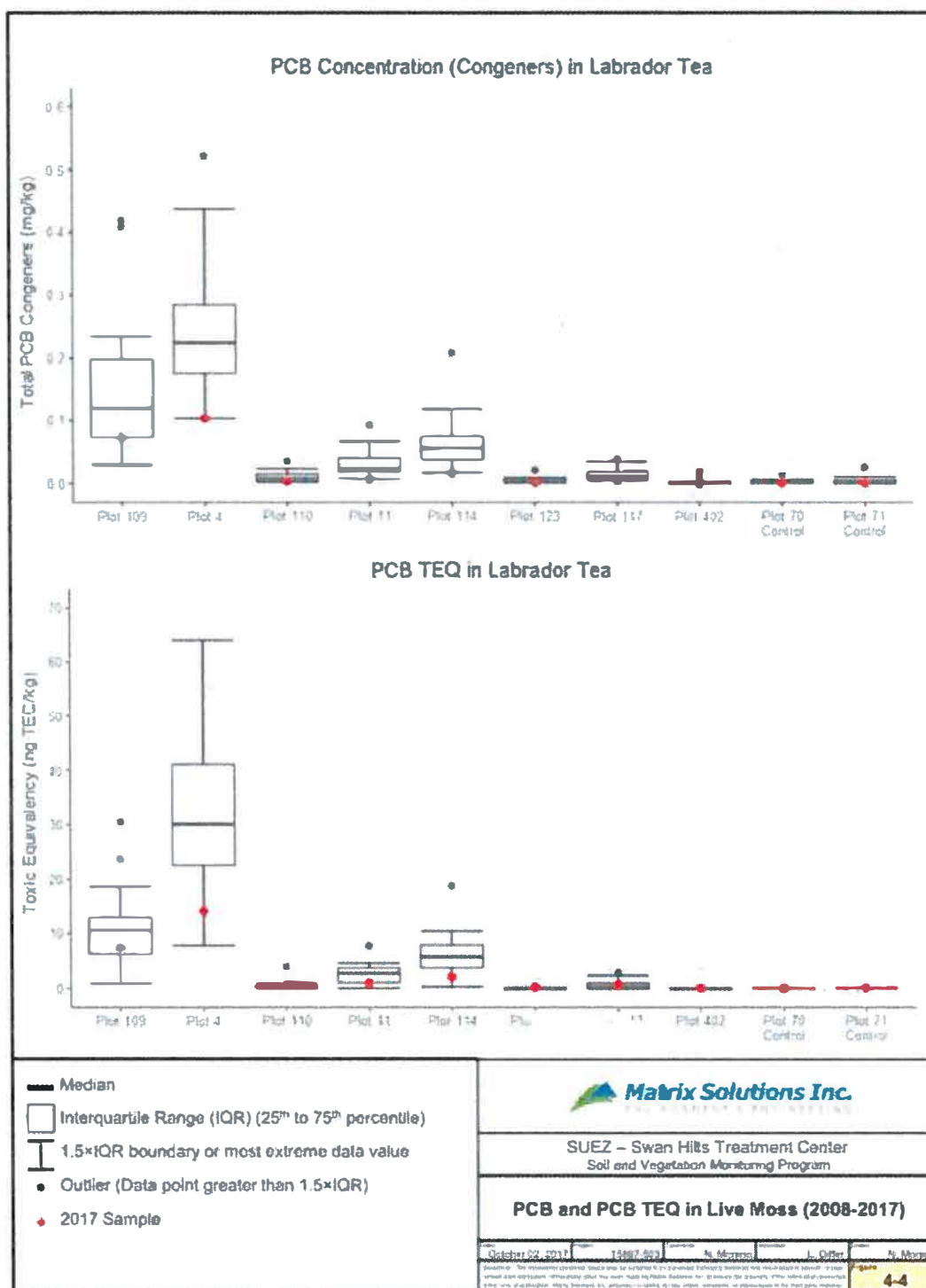


Figure 4-4: PCB and PCB TEQ in Labrador Tea

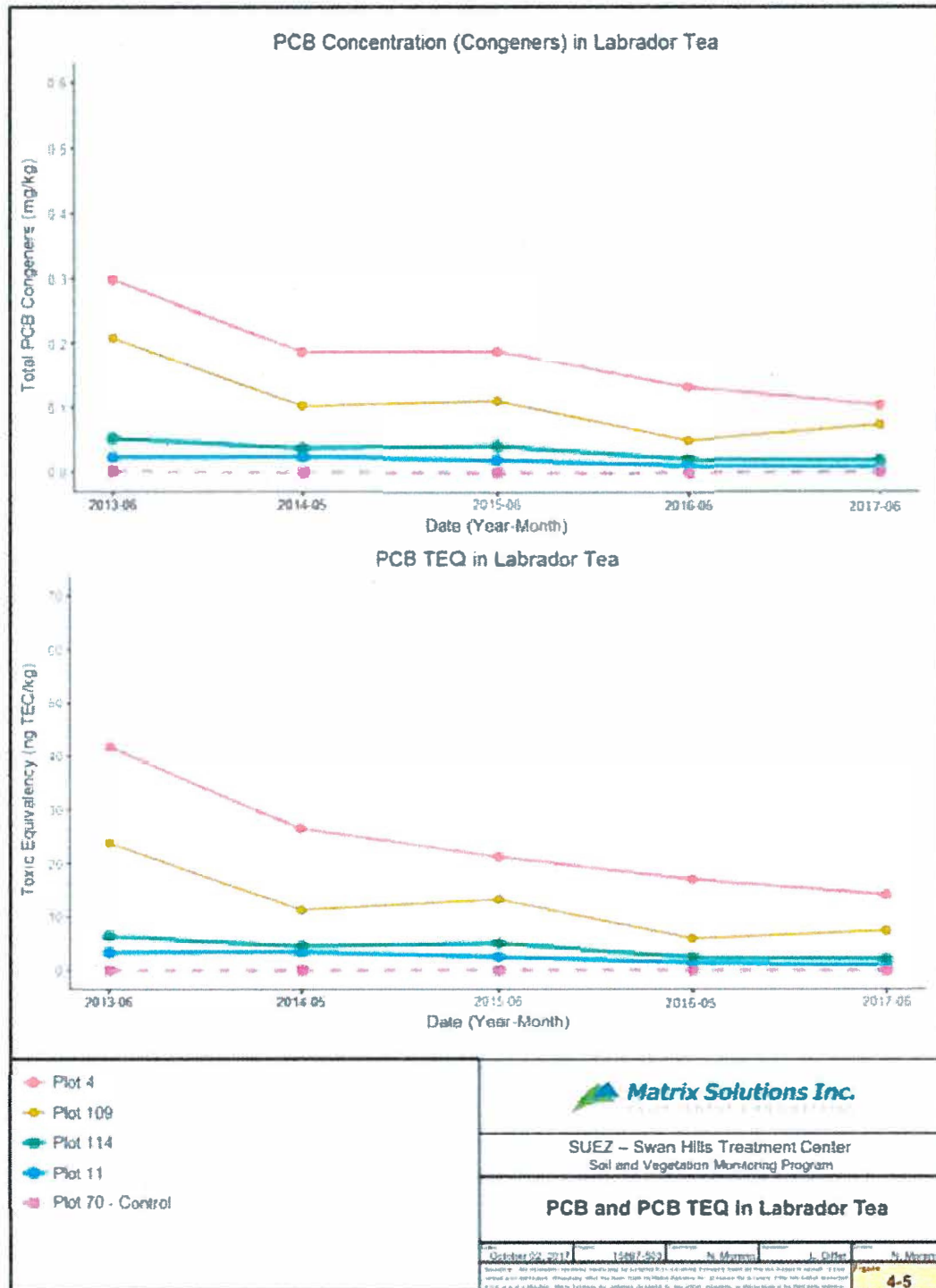


Figure 4-5: PCB and PCB TEQ in Labrador Tea

4.3 Moss Bag Washing and Dustfall Sampler Trial Results

Two trials were completed in 2017 to improve the sensitivity of the methods used to monitor atmospheric metal deposition (moss bags). One of these trials evaluated whether acid washing the moss used in the moss bags could reduce baseline metal concentrations in the moss. A second trial looked at whether the dustfall sampling method was adaptable to sampling finer particulate matter. Based on the results of these trials it appears that acid washing the moss is effective at reducing baseline metal concentrations, although, the level of effectiveness varied depending on the metal parameter. Based on the results from the dustfall sampler trial this methodology appears to be more suited to sampling coarser windblown particulates and does not appear to be adaptable to sampling finer particulates that would be associated with metal deposition from the SHTC's emissions.

4.4 Recommendations for the 2018 Program

The recommendations for the 2018 monitoring program are as follows:

- In 2018 both the routine plots and the moss bag plots will be sampled and analyzed for the same parameters as completed for the 2016 program.
- Washed and unwashed moss bags will be deployed at all the moss bag plots in order to compare the results and determine if acid washing should be adopted as a preparation step before deploying the moss bags.
- Plot maintenance will continue to be completed at the annual monitoring plots and select expanded program plots.

5 GROUNDWATER

5.1 Scope

The groundwater monitoring sampling program follows the requirements outlined in Alberta Environment Approval No. 1744-02-01.

Three depth intervals are monitored. The shallow and intermediate intervals monitor groundwater in the surficial till deposits. The sandstone interval monitors the groundwater in the Paskapoo Formation between 50 and 70 metres Below Ground Surface (mBGS).

The groundwater flow in the shallow and intermediate intervals is generally to the east at an estimated velocity of 0.14 metres per year (m/yr) for the shallow till and 0.017 m/yr for the deeper till (intermediate interval wells). The groundwater flow in the sandstone interval could not be determined for 2017.

5.2 Results and Conclusions

Based on the 2017 groundwater monitoring, the following conclusions can be made:

- Petroleum hydrocarbon (Benzene, Toluene, Ethylbenzene, Xylenes, Fraction 1; BTEX, F1) concentrations were below the laboratory detection limit for all wells sampled in 2017.
- Total Polychlorinated biphenyl (PCB) concentrations were below the laboratory detection limit for all wells sampled in 2017.
- Total dissolved solids:
 - Several of the wells completed in the till interval (shallow and intermediate wells) have Total Dissolved Solids (TDS) concentrations above the Alberta Tier II Potable Groundwater Guidelines, however, these concentrations are consistent with baseline and/or historical observations, as well as, expected TDS concentrations for a till lithology.
- Manganese concentrations exceeding the Alberta Tier II Potable Groundwater Guideline were observed in all monitoring wells except 03-SH, 05-SH, 08-SH, 15-SH, 16-SH, and 17-SH. Manganese concentrations have been measured since the 1990s and have typically exceeded the guideline in both up-gradient and down-gradient wells; therefore it is likely naturally occurring.
- Elevated iron and manganese concentrations may be a result of biological activity. Orange and black residues and/or oxidation was noted on several bladder pumps and tubing during well maintenance in May 2014. Iron reducing bacteria tests from 2015 confirmed the presence of

anaerobic iron related and enteric bacteria in monitoring wells 01A-SH, 01A-IN, 04-IN, 04-SS, 07-SH, 07-IN, and 16-SH.

- The elevated chloride concentrations in 07-SH may be caused by infiltration of run-off containing road salt from the adjacent parking lot and road. Increasing chloride trends are observed in 01A-SH, 05-SH, 06-SH, 07-SH, 08-SH and 13-SH. Monitoring wells 05-SH, 06-SH, 07-SH, 08-SH and 13-SH are located in low-lying areas adjacent to roads while 01A-SH is located on the plant site.
- MW-01A:
 - The TDS and major ion groundwater chemistry of 01A-SH and 01A-IN appears to be affected by rain and surface water infiltration.
 - High dissolved organic compound (DOC) concentrations may be a result of the composition of the engineered fill, as well as activity at the ERT Fire Training Pad. The high DOC probably results in anaerobic conditions in the monitoring well.
 - Sulphur odour and reduced pH in 01A-SH indicates the presence of sulphur reducing bacteria that is confirmed by the results of the sulphate reducing bacteria test conducted in 2015.
- A spike in the DOC concentration in 08-SH is potentially due to surface water impacting groundwater chemistry. Monitoring well 08-SH is located southeast of an area that frequently has ponding water during sampling and this well is exhibiting frost heave which may have compromised the surface seal around the monitoring well.
- Figures 5-1 to 5-3 show the groundwater sample locations and exceedances.



Swan Hills Treatment Centre





5.3 Recommendations

The following recommendations are made based on the above conclusions and observations made during the fieldwork:

- If dry piezometers are encountered, the water level in the corresponding well should be measured with clean equipment to verify if the well is dry or if the piezometer is compromised.
- Begin replacing historically dry sandstone wells or install new wells along the western edge of the Site to assess background groundwater conditions. If the down-gradient sandstone wells show increasing trends in parameters indicative of groundwater contamination in the future, the up-gradient wells will be important in determining if the source of the contamination is the Swan Hills Treatment Centre or oil and gas activity up-gradient of the plant site.
- DOC concentrations and other groundwater indicator parameters will be monitored to determine if groundwater in 08-SH is impacted by surface water. If confirmed, this well will require replacement.

6 SURFACE WATER & SEDIMENT MONITORING

6.1 Scope

6.1.1 *Surface Water*

Surface water quality (i.e., that of lakes and streams) near the SHTC is important for both human health and the integrity of aquatic ecosystems. The surface water monitoring program evaluates spatial and temporal patterns in water quality relative to the SHTC. In 2017, monitoring occurred at one river (Coutts River) and two lakes (Edith Lake and Chrystina Lake) as part of the regulatory environmental monitoring program. The Coutts River and Chrystina Lake monitoring stations are located downgradient and downwind of the SHTC. Specifically, the Coutts River station (S5A) is approximately 5.0 km southeast of the SHTC, while the Chrystina Lake station (S12) is approximately 1.5 km northeast of the SHTC. Edith Lake is the background reference lake for the surface water monitoring program, and is situated upwind and upgradient from the SHTC, approximately 15 km from the facility.

Over 60 water quality parameters were measured, including routine, nutrient, biological, and metal parameters. Additionally, hydrometric measurements were collected, including measuring stream discharge in the Coutts River at the time of sampling and continuous *in-situ* water level monitoring at all three waterbodies from June to September 2017. For each of the surface water quality parameters measured at each monitoring site, summary statistics were calculated to place the 2017 measurements in historical context (where adequate data were available). Values that were high relative to historic measurements were flagged. Measurements from 2017 were also compared to Alberta Surface Water Quality Guidelines for the Protection of Aquatic Life (PAL) (where available) and exceedances were noted and described. Finally, non-parametric monotonic trend analysis was conducted on parameters with at least 8 years of data and with fewer than 30% of those measurements being censored. The Mann-Kendall test was used to assess whether water quality parameters significantly increased, decreased, or lacked a distinct pattern over time.

6.1.2 *Sediment*

Sediment quality in waterbodies near the SHTC is an important indicator of both current environmental conditions affecting aquatic biota and of cumulative pollutant deposition. The sediment monitoring program evaluates spatial and temporal patterns in water quality relative to the SHTC, with stream stations being monitored annually and lake stations monitored biannually. In 2017, sediment samples were collected from two streambed sites (Coutts River and S6) and at both Edith Lake and Chrystina Lake as part of the regulatory environmental monitoring program. Over 80 sediment quality parameters were measured, including nutrient, metal, and organic parameters. S6 is located approximately 700 m southwest of the SHTC and is along an unnamed tributary of the Coutts River. This tributary discharges into the main stem of the Coutts River downstream of S5A (Coutts River); thus, the two stations do not influence each other. The Edith Lake, Chrystina Lake (S12) and Coutts River (S5A) monitoring stations are as described above.

Similar to the surface water quality monitoring program, summary statistics were calculated for each sediment parameter at each site to place the 2017 measurements in historical context (where adequate data were available). Values that were high relative to historic measurements were flagged. Measurements from 2017 were also compared to CCME Sediment Quality Guidelines for the Protection of Aquatic Life (PAL) (where available) and exceedances were noted and described. Finally, non-parametric monotonic trend analysis was conducted on parameters with at least 8 years of data and with fewer than 30% of those measurements being censored. The Mann-Kendall test was used to assess whether sediment quality parameters significantly increased, decreased, or lacked a distinct pattern over time.

6.2 2017 Monitoring Program Changes

6.2.1 *Surface Water*

The surface water quality monitoring program in 2017 was unchanged from 2016.

6.2.2 *Sediment*

The 2017 sediment quality monitoring program featured sampling of both Edith Lake and Chrystina Lake to provide supplemental data for the sediment core sample that was collected from Lesser Slave Lake the week of March 12-16, 2018. This sample will be aged and PCB analyses conducted from selected depths to collect historical depositional data. This sampling is being conducted in response to concerns raised during the Approval renewal process.

6.3 Summary of Results

6.3.1 *Surface Water*

Based on the 2017 monitoring results, surface water quality near the SHTC has not significantly changed and is comparable to historical conditions observed in the Coutts River, Chrystina Lake, and Edith Lake. PAL guidelines were met for all inorganic parameters, except dissolved iron in the Coutts River and Edith Lake and total alkalinity in both Edith Lake and Chrystina Lake. Given that the values of both parameters analysed in 2017 were largely consistent with the median of the historical data, these exceedances likely reflect natural phenomena. Iron is a major element in soil and as such, Alberta surface water samples frequently exceed guidelines. The low alkalinity value reflects the naturally low buffering capacity in the lakes. At Edith Lake, pH was within PAL guidelines in 2017 and has not significantly decreased over time. Conversely, pH has increased at Chrystina Lake (and in the Coutts River), indicating that acidification of this lake through atmospheric deposition does not appear to be occurring. Electrical conductivity decreased over time in both lakes due to a decrease in several ions, while the opposite trend has occurred in the Coutts River. At all three sites, arsenic concentrations increased over time, which indicates a regional phenomenon. Dissolved manganese and total silicon also increased in the Coutts River. Monitoring of metals and lake pH status should continue in the future.

A summary of historical range and regulatory guideline exceedances, as well as significant water quality trends, is outlined in Table 6-1.

Table 6-1: Summary of 2017 Surface Water Quality Monitoring Program¹

Parameter	Above Historical Range			Exceeding Regulatory Guidelines			Mann-Kendall Trends		
	Chrystina L. (S12)	Edith L.	Goutts R. (S5A)	Chrystina L. (S12)	Edith L.	Goutts R. (S5A)	Chrystina L. (S12)	Edith L.	Goutts R. (S5A)
Alkalinity (as CaCO ₃)	-	-	-	> AB	> AB	-	↓	↓	↓
Aluminum, total	-	✓	-	-	-	-	↓	-	↓
Antimony, total	-	✓	-	-	-	-	↓	-	↓
Arsenic, total	-	-	-	-	-	-	↓	↑	↓
Barium, total	-	✓	-	-	-	-	↓	-	↓
Bicarbonate	-	-	-	-	-	-	↓	↓	-
Calcium	-	-	-	-	-	-	↓	↓	↓
Carbon, total organic	-	-	-	-	-	-	↓	-	↓
Chloride	-	-	-	-	-	-	↓	-	↓
Chlorophyll- <i>a</i>	-	✓	-	-	-	-	-	-	↓
Cobalt, total	-	-	-	-	-	-	↓	-	↓
Copper, total	-	-	-	-	-	-	↓	-	↓
Electrical Conductivity	-	-	-	-	-	-	↓	↓	↓
Hardness	-	-	-	-	-	-	↓	↑	↓
Ion Balance	✓	✓	✓	-	-	-	↓	-	↓
Iron, dissolved	✓	✓	-	-	> AB	> AB	↓	-	-
Iron, total	✓	✓	-	-	-	-	↓	-	-
Lead, total	-	✓	-	-	-	-	-	-	-
Magnesium	✓	-	-	-	-	-	-	-	-
Manganese, dissolved	-	-	-	-	-	-	-	↓	↓
Manganese, total	-	-	-	-	-	-	-	↓	↓
Molybdenum, total	-	-	-	-	-	-	-	↓	↓
Mercury, total	-	-	-	-	-	-	↓	↓	↓
Nitrogen, nitrate+nitrite	✓	-	-	-	-	-	↓	↓	↓
Nitrogen, ammonia	✓	-	-	-	-	-	-	-	↓
Nitrogen, total Kjeldahl	-	-	-	-	-	-	-	-	↓
pH	-	-	✓	-	-	-	↑	-	↑
Potassium	-	-	-	-	-	-	-	↓	↓
Silicon, total	-	✓	-	-	-	-	-	-	↓
Sodium	-	✓	-	-	-	-	-	-	↓
Strontium, total	✓	-	-	-	-	-	-	-	-
Sulphur, total	-	-	-	-	-	-	↓	↓	-
Titanium, total	-	-	-	-	-	-	↓	↓	-
Total Anions	-	-	-	-	-	-	↓	↓	↓
Total Cations	✓	✓	-	-	-	-	-	-	-
Total Dissolved Solids	-	-	-	-	-	-	↓	↓	↓
Total Suspended Solids	-	-	-	-	-	-	↓	-	-

1. Including variables that were high in 2017 relative to historical levels, exceedances of regulatory guidelines (AB = Alberta chronic quality guidelines for surface waters: ESRD 2014), and significant ($\alpha = 0.1$) water quality trends over time for each of three monitoring sites. i = insufficient data available for trend calculation.

6.3.2 *Sediment Quality*

Generally, sediment quality near the SHTC has not significantly changed, and is comparable to historical conditions observed in the Coutts River, Chrystina Lake, and Edith Lake. That said, a number of metals were historically high in 2017 in Edith Lake and the two stream systems. Given that these values occurred in both the reference (Edith Lake, S6) and test (Coutts River) sites, it is unlikely that they are caused by the SHTC. It is likely that these values were caused by the historically high runoff and stream discharge that occurred in 2017. Total arsenic exceeded the Interim Sediment Quality Guideline (ISQG) at Edith Lake, S6 and the Coutts River. The historical ranges in total arsenic concentrations at S6 and both lakes encompass values above sediment PAL guidelines; thus, it is likely that concentrations are naturally elevated in this region. Increasing trends in arsenic were seen at S6 and the Coutts River. Total cadmium exceeded ISQG at Edith Lake, but was within the historical range at all four sites. Increasing trends for several metals were observed at both the Coutts River and the reference sites S6 and Edith Lake. Total PCBs decreased over time in the Coutts River and Chrystina Lake, but largely remained unchanged in the reference sites Edith Lake and S6. Toxic equivalencies (TEQs) for dioxins and furans exceeded ISQG in the reference site Edith Lake and Chrystina Lake. These are a result of how the non-detect data are handled in the TEQ calculation, rather than actual exceedances. No upward trends in TEQs were detected, and TEQs for dioxins and furans are actually decreasing over time for the stream stations.

A summary of historical range and regulatory guideline exceedances, as well as significant sediment quality trends, is outlined in Table 6-2.

Table 6-2: Summary of 2017 Sediment Quality Monitoring Program¹

Parameter	Above Historical Range				Exceeding Regulatory Guidelines				Mann-Kendall Trends			
	Chrystina L. (S12)	Edith L.	Coutts R. (S5A)	S6	Chrystina L. (S12)	Edith L.	Coutts R. (S5A)	S6	Chrystina L. (S12)	Edith L.	Coutts R. (S5A)	S6
Aluminum	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Antimony	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Arsenic	✓	✓	✓	✓	✓	> ISQG	> ISQG	> ISQG	✓	✓	✓	✓
Barium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Boron	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cadmium	✓	✓	✓	✓	✓	> ISQG	✓	✓	✓	✓	✓	✓
Calcium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chromium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cobalt	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Copper	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Iron	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lead	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Magnesium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Manganese	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mercury	✓	✓	✓	✓	✓	> ISQG	✓	✓	✓	✓	✓	✓
Molybdenum	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nickel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PCB TEQ	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PCDD/F TEQ	✓	✓	✓	✓	> ISQG	> ISQG	✓	✓	✓	✓	✓	✓
Phosphorus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Potassium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sodium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strontium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sulphur	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Thallium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Titanium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total Carbon	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total Organic Carbon	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total PCBs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Uranium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vanadium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Zinc	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

1. Including variables that were high in 2017 relative to historical levels, exceedances of regulatory guidelines (ISQG = interim sediment quality guidelines: CCME 2001c), and significant ($\alpha = 0.1$) water quality trends over time for each of four monitoring sites. ✓ = insufficient data available to for trend calculation.

6.4 Recommendations

Consider revising the variables list to focus on those that are directly tied to present-day SHTC emissions and create a better tie-in to the air quality monitoring program. Recommend creating a Criteria & Indicator monitoring framework that specifically ties monitoring goals, objectives and criteria to indicators. This will improve the efficiency and adaptability of the program.

Discontinue collecting continuous water level data, since these are not affected by SHTC and are not used for water/sediment data analysis. However, discharge measurements should continue during sample collections since surface water data correction for flow is necessary. Use Water Survey of Canada Swan River hydrometric station near the Town of Swan Hills to report on regional climate-mediated hydrologic processes.

Since Chrystina and Edith lakes have medium to high acid sensitivity, use these sites to track the potential effects of acid deposition in the area, specifically focus on pH and other related acid sensitivity parameters (e.g., gran alkalinity) in both lakes. Continue monitoring other metals with toxicity related to hardness (i.e., cadmium, copper, lead, and nickel), since hardness is naturally low in the two lake stations.

Continue monitoring arsenic since increasing trends were observed in surface water at most sites.

Similarly, continue to monitor metals in sediments, as these compounds were historically high in Edith Lake and the Coutts River.

Rather than conducting trend analysis on the entire dataset, complete trend analysis on post 2008 data, which is more representative of the normal range.

7 FISH TISSUE MONITORING

Swan Hills Treatment Centre (SHTC) conducts an annual comprehensive monitoring program in accordance with Section 4.8 of its Environmental Protection and Enhancement Act (EPEA) approval No. 1744 to operate. Each year the monitoring program is revised as necessary to address stakeholder needs and program recommendations.

7.1 Scope

The 2017 fish tissue monitoring program included sampling brook trout from Chrystina Lake, and from Edith Lake which is used as a local reference. Brook trout implanted with coded wire tags (CWT) are stocked into both lakes each spring by the Cold Lake Fish Hatchery. CWTs have been implanted into stocked brook trout since 2012, and provide known fish ages using codes specific to each year of stocking. The CWT program has improved age accuracy over the past five years, and now is the primary aging method used. Fish tissue samples collected from both lakes were separated by age and sent to SGS AXYS Analytical Services Ltd. (SGS AXYS) for organic analyses of polychlorinated biphenyls (PCB), dioxins, and furans. Samples analysed for metals are sent also to Maxxam Analytics Inc. (Maxxam). Chemical tissue concentrations and fish characteristics from Chrystina Lake have been summarized for comparison with Edith Lake brook trout, and control brook trout from the Cold Lake fish hatchery. Tissue concentrations in 2017 also have been compared with regulatory guidelines, and historical ranges. Brook trout tissue for analysis was collected from Chrystina and Edith lakes between September 11 and 13, 2017.

7.2 2017 Program Changes

The 2017 fish tissue monitoring program is similar to previous years and continues to build on changes implemented in 2016.

This included the use of alternative fishing methods (angling and fyke netting) during sampling to maximize catch rates, particularly for larger brook trout.

The 2017 data continued to build upon reconstructed life histories to investigate trends in PCB accumulation in Chrystina Lake. PCBs represent a mixture of 209 compounds with a similar chemical structure referred to as congeners. The congener profile of a sample refers to the percentage that each congener contributes to the total PCB concentration. Advisian compared congener profile graphs in 2017 with historical data to identify accumulation patterns at a congener level. The 2017 congener profiles of Chrystina Lake brook trout also were compared with Edith Lake and hatchery brook trout.

7.3 Guidelines

Chemical concentrations measured in fish tissue are compared with regulatory guidelines and toxicological thresholds to identify chemicals of concern and any potential ecological/human health risks. Tissue concentrations of organics were compared with Canadian Council of Ministers of the Environment (CCME⁸) Canadian tissue residue guidelines for the protection of wildlife consumers of aquatic biota. The CCME guidelines are based on Toxic Equivalency (TEQ) which is calculated from the concentrations of dioxins, furans, and coplanar PCBs weighted by toxicity factors developed by the World Health Organization (WHO). Coplanar PCBs include a group of twelve congeners that cause toxic effects through a metabolic pathway similar to that of dioxins and furans. Coplanar PCBs also are known as “dioxin-like” congeners as a result. Metals were analysed for all tissue samples, and concentrations were compared with the Canadian Food Inspection Agency (CFIA⁹) Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products, and thresholds determined by the Society of Environmental Toxicology and Chemistry (SETAC¹⁰). Tissue concentrations for all parameters also were compared with historical maxima and minima for each of the age classes analysed.

7.4 Summary of Results

The number of brook trout over 300 millimetres (mm) long captured from Chrystina Lake increased from five fish in 2016 to fourteen fish in 2017, and catch rates in both lakes increased in 2017. Many non-target fish (white sucker and yellow perch) but few brook trout were captured in the fyke net in 2017. The low brook trout catch rate using the fyke net may be related to net visibility in the water column. Most (94%) brook trout captured from both lakes had CWTs, and all fish analysed were aged using CWTs for the first time since the start of the tagging program. This provided definitive ages for each brook trout analysed in 2017. Many contaminants, including PCBs and mercury, are known to accumulate in biological tissue, so

⁸ CCME (Canadian Council of Ministers of the Environment). 2001. Canadian tissue residue guidelines for the protection of wildlife consumers of aquatic biota: Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/Fs). In: Canadian environmental quality guidelines, 1999, CCME, Winnipeg.

⁹ CFIA (Canadian Food Inspection Agency). 2014. Fish Product Standards and Methods Manual. Appendix 3: Canadian Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products. Amend. No. 14. Available at: <http://www.inspection.gc.ca/english/animal/fispoi/guide/chme.shtml>. Accessed: January 2014.

¹⁰ SETAC (Society of Toxicology and Chemistry). 1998. Linkage of effects to tissue residues: Development of a comprehensive database for aquatic organisms exposed to inorganic and organic chemicals by A. W. Jarvinen and G.T. Ankley. SETAC Technical Publication Series.

accurate age estimates are important for comparing contaminant concentrations as fish age in Chrystina Lake. Tissue samples were analysed as composites of three fish when possible, and as individual fish if only a single brook trout was captured from the respective age class. Brook trout samples included in the 2017 chemical analyses are provided in Table 7-1; identifiers used for each analysed sample are provided in brackets.

Estimated brook trout health ranged from poor to good in Chrystina Lake and Edith Lake, and the range of fish condition was similar in the two lakes, and has been relatively consistent since 2010. Based on stomach contents, water boatmen are the dominant food source in Edith Lake. Food sources in Chrystina Lake are more variable and include brook stickleback, juvenile white sucker, water boatmen, and other aquatic macroinvertebrates.

Table 7-1: Brook Trout Age Classes Analysed during 2017 Fish Tissue Monitoring

Age Class	Chrystina Lake	Edith Lake
1 ⁺ year-old	Composite (CHBKTR1 ⁺)	Composite (EDBKTR1 ⁺)
2 ⁺ year-old	Composite (CHBKTR2 ⁺), Individual (CHBKTR 2A ⁺)	Composite (EDBKTR2 ⁺)
3 ⁺ year-old	Composite (CHBKTR3 ⁺)	Composite (EDBKTR 3 ⁺)
4 ⁺ year-old	Individual (CHBKTR 4 ⁺)	Individual (EDBKTR 4 ⁺)
5 ⁺ year-old	Individual (CHBKTR 5 ⁺)	No samples analysed

Notes:

1⁺ year-old hatchery brook trout (HATCH) were also analysed to control for potential exposure to chemicals in the hatchery before stocking.

The 2017 total PCB concentrations in Chrystina Lake, Edith Lake, and hatchery brook trout are provided in Figure 7-1. Concentrations in Chrystina Lake increased with fish age in 2017, whereas concentrations in Edith Lake brook trout remained relatively consistent as fish aged. Total PCB concentrations did not exceed historical maxima of any age class in 2017. The total PCB concentration in the 4⁺ year-old from Chrystina Lake was a historical minimum for this age class. In addition, PCB concentrations in Edith Lake brook trout generally were low compared with historical data, and 3⁺ and 4⁺ year-old Edith Lake brook trout samples also were below historical minima.

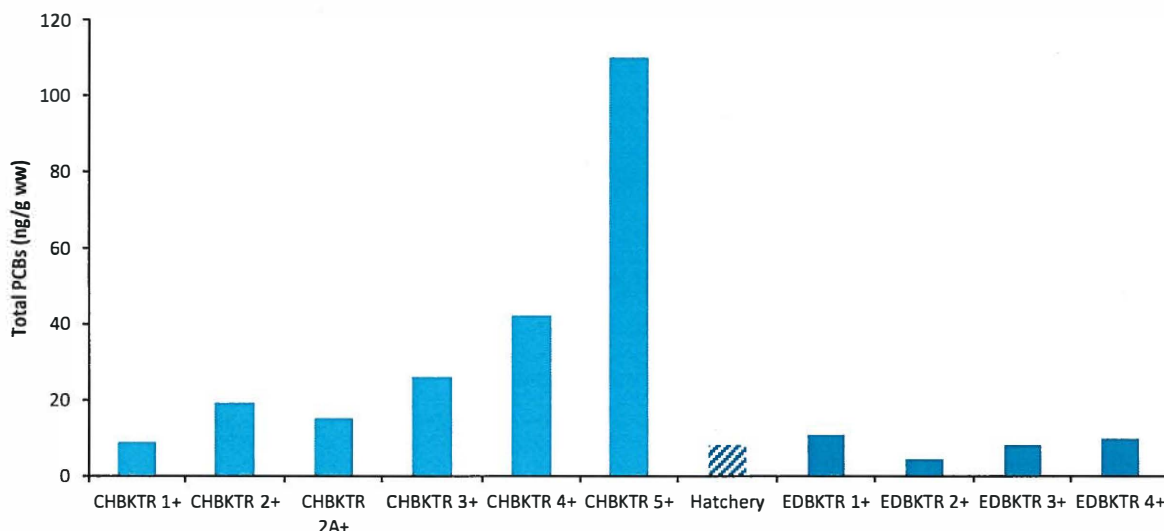


Figure 7-1: Total PCB Concentrations in Brook Trout Tissue in 2017

Dioxin and furan concentrations in 2017 were near or below detection, and contributed little to overall toxicity. This is consistent with historical results which indicate that coplanar PCBs, particularly PCB 126, tend to drive toxicity in brook trout from both lakes. Overall toxicity is quantified as total TEQs, which are provided in Figure 7-2. The 2017 total TEQs of Chrystina Lake brook trout are compared with historical data for each age class, as well as results from Edith Lake and hatchery brook trout (Figure 7-2). With the exception of the 5⁺ year-old, Chrystina Lake brook trout, TEQs are relatively low in 2017 (Figure 7-2). The total TEQs of the 1⁺ and 2⁺ year-old brook trout from Chrystina Lake represent historical minima. In addition, the TEQ of the 4⁺ year-old from Chrystina Lake is near the historical minimum. The total PCB concentration of the 5⁺ year-old is similar to the historical average of the 4⁺ year-old age class in Chrystina Lake. A disproportionately high concentration of PCB 126 elevated the toxicity of this individual (Figure 7-2). In Edith Lake, the total TEQ of 3⁺ and 4⁺ year-old brook trout both were below historical minima. The 2⁺ year-old brook trout from Edith Lake also was a historical minimum if dioxins and furans are not included in the TEQ calculation.

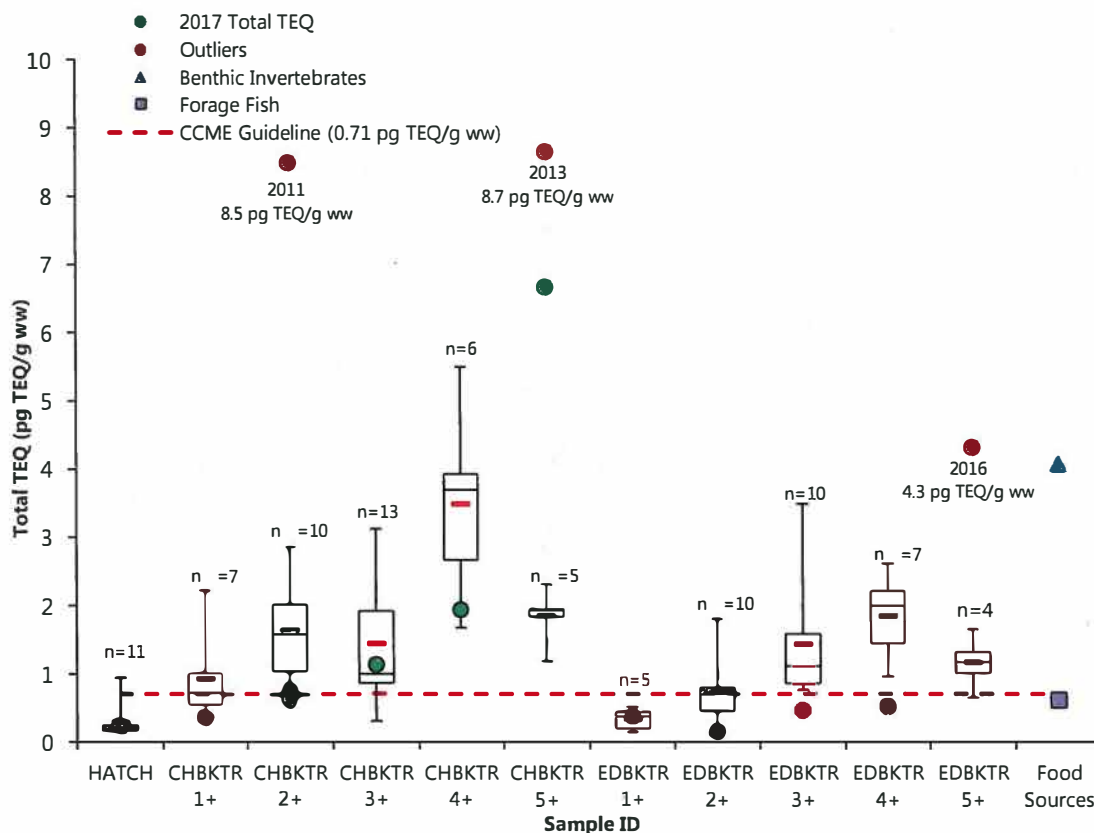


Figure 7-2: Comparison of 2017 Total TEQs with Historical Data

PCB congener profiles of Chrystina Lake brook trout analysed from 2013 to 2017 were similar within age classes. The proportion of PCBs with five to seven chlorine substitutions, such as PCB 153, increased or remained constant as brook trout aged in Chrystina Lake indicating a higher potential to accumulate in tissue (Figure 7-3). PCB 153 was used to artificially reconstruct life histories given its tendency to accumulate. These life histories were used to examine accumulation patterns among age classes but are limited by short lifespan, and limited tissue analyses for each cohort. There currently are no guidelines for individual PCBs apart from coplanar congeners and the guideline for total PCBs in Canada is under review. These analyses therefore provide some rigour in the absence of regulatory guidelines.

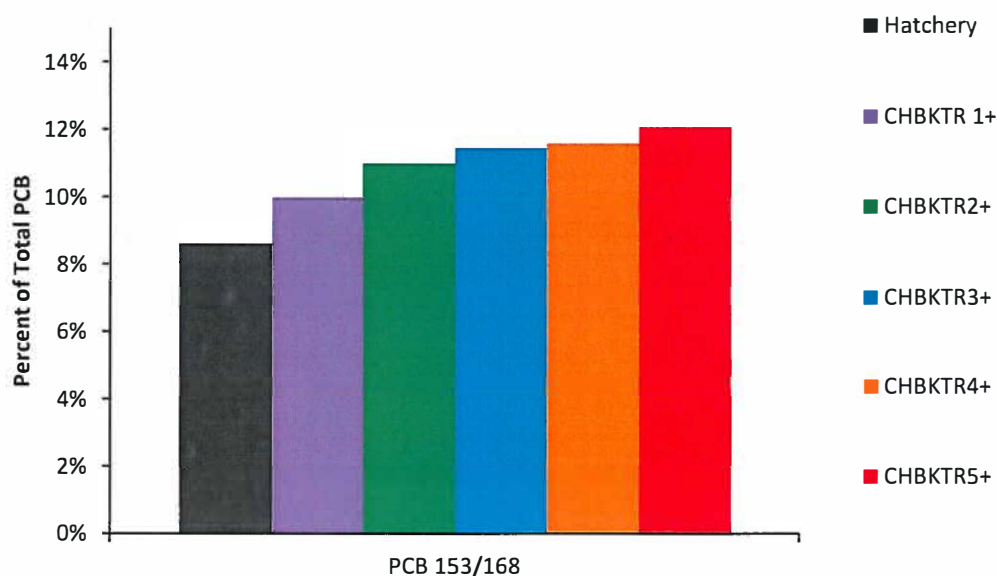


Figure 7-3: Percentage of Total PCB for PCB 153/168

Guideline exceedances and variables outside historical ranges in 2017 are summarized in Table 7-2. Concentrations of Chrystina Lake brook trout were below historical maxima for all variables. In addition, CFIA guidelines were not exceeded in any samples from 2017. Metals that exceeded the SETAC threshold are consistent with historical data. The CCME guideline exceedances are also consistent with historical data. Fewer TEQs exceeded guidelines in 2017 compared with 2016 in Chrystina Lake. The TEQs of all age classes in Edith Lake also are below guideline. Many organic variables represented historical minima in 2017, particularly in young brook trout in Chrystina Lake and older fish from Edith Lake. These results are indicative of a relatively low contaminant load in fish samples analysed during the 2017 fish tissue monitoring program relative to historical results.

Table 7-2: Guideline Exceedances and Historical Comparisons of 2017 Tissue Concentrations

Sample ID	CCME (2001)	SETAC (1999)	CFIA (2014)	Below Historical Range	Exceeds Historical Maximum
HATCH	---	Al, Se, Zn	---	Cr, Tl, Ti	PCB 189
CHBKTR 1 ⁺	---	Zn	---	PCB TEQ, Dioxin TEQ, Total TEQ, Ti, PCB 77, 126, 169	---
CHBKTR 2 ⁺	Total TEQ	Al, Zn	---	Ti, PCB 77	---
CHBKTR 2A ⁺		Zn	---	PCB TEQ, Total TEQ, Ti, PCB 77, 105, 114, 118, 123, 126	---
CHBKTR 3 ⁺	PCB TEQ, Total TEQ	Al, Zn	---	Ti	---
CHBKTR 4 ⁺	PCB TEQ, Total TEQ	Al, Zn	---	Total PCBs, Pb, Ti, PCB 77	---
CHBKTR 5 ⁺	PCB TEQ, Total TEQ	Zn	---	Pb, Mn	---
EDBKTR 1 ⁺	---	Se, Zn	---	Pb, Ti	Mg, P, K
EDBKTR 2 ⁺	---	Zn	---	PCB TEQ, PCB 77, 81, 126, 169	---
EDBKTR 3 ⁺	---	Al, Zn	---	PCB TEQ, Total TEQ, Total PCBs, all Coplanar PCBs	---
EDBKTR 4 ⁺	---	Zn	---	PCB TEQ, Dioxin/Furan TEQ, Total TEQ, Total PCBs, all Coplanar PCBs, Ti	---

Notes:

Inorganic parameters have been identified by their periodic table identifier.; Al = Aluminum; Cr = Chromium; K = Potassium; Mg = Magnesium; Mn = Manganese; P = Phosphorus; Pb = Lead; Se = Selenium; Tl = Thallium; Ti = Titanium; Zn = Zinc.

7.5 Summary of Conclusions:

Fish condition remains similar in both lakes, and has been relatively consistent over the past ten years. Fyke net catch rates are high for non-target species, but remained low for brook trout in 2017 possibly because of high visibility of the net in the water column. The number of large (>300 mm FL) brook trout captured from Chrystina Lake increased from five in 2016 to fourteen in 2017, but no very large (>400 mm FL) brook trout were captured. Overlapping size distributions of younger (<3+ years old) age classes are visible in the length-frequency distribution of brook trout tagged since 2012, which also supports earlier observations of high size variability within age classes. No 4+ and 5+ year-old tagged brook trout have had fork lengths <300 mm, but few tagged individuals have been captured from these age classes to date.

A summary of the tissue residue guideline/threshold exceedances in 2017, as well as variables with concentrations outside of historical range are provided in Table 7-2. Overall, fewer TEQ concentrations exceeded guidelines in 2017 than in 2016 and no historical maxima were documented in Chrystina Lake. Inorganic parameters with concentrations over thresholds were consistent with those historically above these criteria such as zinc and selenium and no concentrations exceeded CFIA guidelines. Aluminum concentrations in 2017 were slightly above the toxicological threshold, which has occurred periodically in both lakes, as well as hatchery brook trout. Aluminum exceedances in 2017 also were documented in Edith Lake and CLFH brook trout indicating that elevated concentrations in Chrystina Lake brook trout are not likely related to treatment centre activities. Statistically significant increasing or decreasing trends were not documented in 2017. Total TEQ and TEQPCB of 3+ to 5+ year-old Chrystina Lake brook trout exceeded guidelines which is consistent with historical data.

Dioxins and furans contributed little to overall toxicity of brook trout tissue while most PCB concentrations in Chrystina Lake were low to average when compared with historical data in their respective age classes. Several organic and inorganic parameters also were below historical minima for CHBKTR 1+ and CHBKTR 2+ age classes. The PCB concentration measured in CHBKTR 5+ was elevated compared with historical data and had a disproportionately high PCB 126 concentration that elevated the TEQ of this sample to the third highest recorded in Chrystina Lake since 2006. Total TEQ of Chrystina Lake brook trout exceeded that measured in Edith Lake brook trout of each age except for 1+ year-olds in 2017. Notably, at least one TEQ in all Edith Lake age classes except for 1+ year-olds, represented a historical minimum (Table 7-2).

The PCB congener profiles of brook trout from Chrystina Lake and Edith Lake have remained similar within each age class since 2013 based on visual comparisons. A comparison of PCB congener profiles between hatchery brook trout and each Chrystina Lake age class supports observations that hatchery brook trout have higher proportions of mono- to tetrachlorobiphenyls, as well as octa- to decachlorobiphenyls. Accumulation patterns within Chrystina Lake brook trout were similar to historical data and Edith Lake brook trout in 2017. Reconstructed life histories were extended for several cohorts in Chrystina Lake in 2017 and generally indicated similar patterns between tracking congeners. A disproportionately high PCB 126 concentration was documented in CHBKTR 5+ which increased the overall TEQ of this individual relative to the total PCB concentration measured.

7.6 2018 Recommendations:

The 2018 FTMP will be conducted using the methods and analysis typically included in the standard monitoring program, which will be the same as those used in 2017. Fyke netting and angling also will be incorporated into the 2018 program given that the additional effort is expected to improve overall catch during sampling. The following specific recommendations will be incorporated into the program to ensure the current level of accuracy is maintained.

CWT Program

The CWT program has substantially improved aging accuracy of brook trout collected during the FTMP, and consecutively higher proportions of tagged fish have been captured over the last five years of sampling. This program also has improved accuracy of length-frequency distributions of various age classes particularly for 3+ year-old or younger brook trout. In order to maintain the high confidence of age estimates in 2017 the CWT program should continue during future programs.

Reduced Fyke Net Selectivity

The catch rate of non-target species using the fyke net is high, but only a single brook trout has been captured in this net over the last two years. It is recommended that a net with a darker mesh be used during the 2018 sampling program, and that the net be baited during deployment to increase the number of fish that enter the net.

Review Inorganic Trend Analysis Methods

The MK trend analysis is a well-established method to identify trends in environmental data sets, but this is a non-parametric analysis which does not account for the magnitude of contaminant concentrations. In addition, this analysis incorporates only simple increasing or decreasing trends. Where sufficient inorganic data are available, more robust trend analyses could be used to identify complex non-linear trends for inorganic variables such as mercury.

8 WILDLIFE

8.1 Scope

As part of its integrated environmental monitoring program, the Swan Hills Treatment Centre (SHTC) has been conducting demographic studies and analyzing levels of various chemicals in the tissues of red-backed voles (*Myodes gapperi*) annually since 1986. During 2017, demographic studies of voles were conducted on 3 live-trapping plots (including the 3 plots that are annually monitored) in June and September as part of the annual wildlife monitoring program (Table 8-1). In addition, concentrations of PCB congeners and dioxins/furans in red-backed vole tissues were determined for animals collected from 10 plots (Table 8-1). Unlike previous years, the concentration of Aroclor PCBs in vole tissues was dropped from the annual monitoring program and will instead only be included as part of the expanded monitoring program which is conducted once every 5 years.

Table 8-1: Summary of Plot Location, Chemical Analyses and Population Monitoring during the 2017 Wildlife Monitoring Program at the SHTC

Plot	Distance from SHTC (km)	Direction from SHTC	Aroclor PCBs	PCB Congeners, Dioxins, Furans	Population Monitoring
11	0.1	N	✓	✓	✓
109	0.2	W	✓	✓	
4	0.3	E	✓	✓	
110	0.3	W	✓	✓	
114	0.7	E	✓	✓	✓
123	1.6	NE	✓	✓	
117	2.4	SE	✓	✓	
402	7.5	E	✓	✓	
70	11.5	SW	✓	✓	✓
71	23	NNW	✓	✓	

8.2 Summary of Results

8.2.1 Population Monitoring

In 2017, overall June red-backed vole populations at the 3 monitoring plots decreased further from 2016 densities. The average population density for the 3 plots decreased 77% from 19.2 voles/ha in June 2016 to 4.4 voles/ha in June 2017 with the largest numerical decrease occurring at plot 70 (from 31.3 to 6.3 voles/ha or -80%). In comparison, the mean population density at the 3 monitoring plots also decreased further from 39.8 to 1.9 voles/ha (-95%) between September 2016 and September 2017. On an individual plot basis, September vole populations decreased at plots 11 (24.3 to 2.1 voles/ha or -91%), 114 (from 29.9 to 2.8 voles/ha or -91%) and 70 (from 65.3 to 0.7 voles/ha or -99%) year-over year. June and September vole densities at the 3 plots were among the lowest recorded in SHTC since 1990 but with the exception of the September density at plot 70, were still within historical ranges. The 2017 September vole density at plot 70 was the lowest ever recorded since monitoring began at this plot in 1990..

Vole populations in the SHTC study area appear to have a 3 to 5 year cycle. Historically, population increases and decreases have been synchronous at the 3 monitoring plots, which also appears to be the case in June and September 2016 (Figures 8-1 and 8-2). However, differences in population densities have been periodically observed amongst plots, particularly in the June populations. By comparison, September vole populations at the 3 plots have tended to be more synchronous with the exception of 2009 and 2010 monitoring years, when some plots exhibited an increase while others decreased. Vole populations at all of the plots declined in September 2011, subsequently increased in both September 2012 and 2013, and then decreased in 2014, indicating a return to population synchronicity that was observed prior to 2009. Population fluctuations observed in the SHTC area since monitoring began in 1986 appear to be related to natural cycles of red-backed vole populations. However, subtle differences in habitat structure at the plots (or site conditions) may also influence the ability of plots to support voles under variable weather conditions, and levels of predation and food supply, which may affect the population dynamics of voles in the SHTC area.

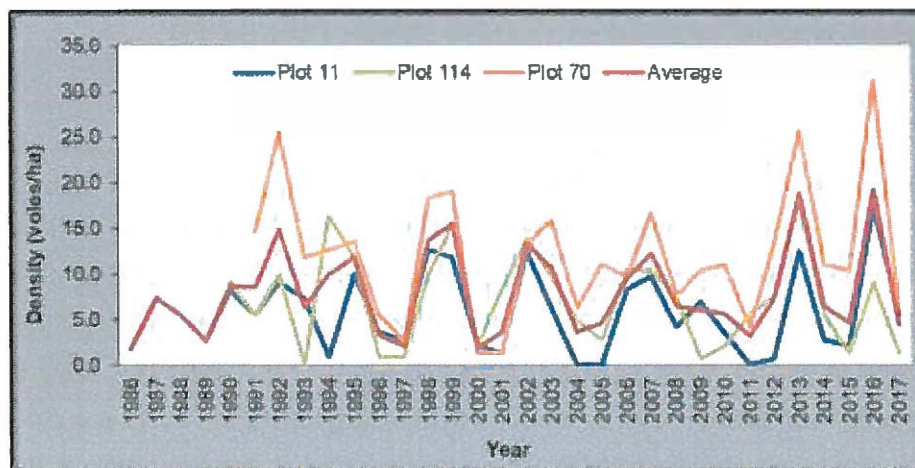


Figure 8-1: Densities of Red-backed Voles in the SHTC Study Area, June 1986 - 2017

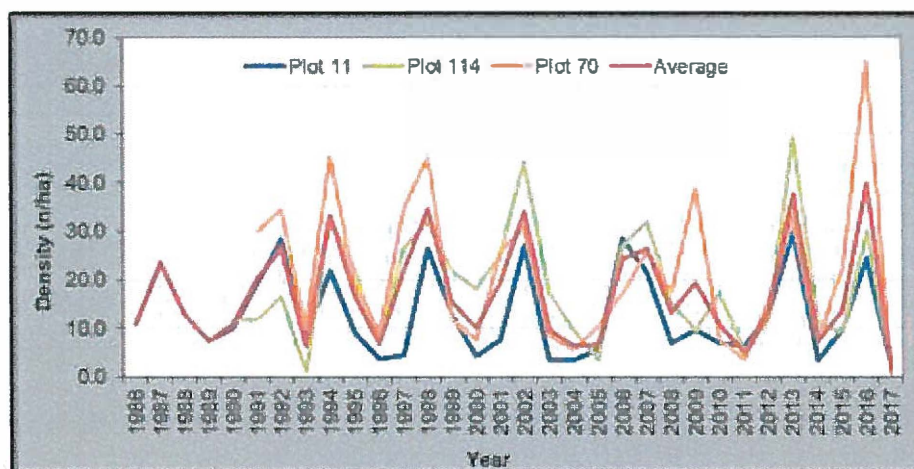


Figure 8-2: Densities of Red-backed Voles in the SHTC Study Area, September 1986-2017

8.2.2 Chemical Analysis

PCB Congeners and TEQs

Overall, average concentrations of PCB congeners in vole tissues decreased (-12.2%) between May 2016 and May 2017 and represents a PCB congener concentration that is 50% lower than the 17 year average (2000 – 2016) for the SHTC study area (Table 8-2). Although PCB TEQ increased at 8 of the 10 plots between May 2016 and May 2017, the overall average of PCB TEQ decreased slightly (-0.2%) because of declines recorded at plots 4 (18.82 pg/g) and 117 (3.38 pg/g). The highest PCB TEQ in 2017 was recorded at plot 4, which has been the case for all but one year (plot 109 in 2012) since 2000 although it was still within the historical range of PCB TEQ values recorded at that plot (Table 8-3). PCB TEQ values at plots 402, 70 and 71 were all <1 pg/g in 2017. Historically, the highest PCB TEQ concentrations have been found in vole tissues collected near (≤ 0.7 km) the SHTC.

**Table 8-2: PCB Congener Concentrations¹ (pg/g) in Red-backed Voles Collected in the SHTC
Study Area, 2000 – 2017**

Year	Plot ²										Average
	11	109	4	110	114	123	117	402	70	71	
2000	480,000	-	300,000	-	170,000	-	24,000	5,500	8,800	3,600	141,700
2001	169,000	563,000	163	28,800	466,000	32,100	34,600	1,960	1,440	479	129,754
2002	627,382	819,944	642,093	16,715	495,810	53,724	108,457	5,557	1,799	393	277,187
2003	249,000	583,000	250,000	11,500	129,000	25,100	35,300	1,330	667	199	128,510
2004	70,359	1,034,201	687,233	133,077	136,802	14,997	17,438	734	1,084	406	209,633
2005	17,865	114,298	140,940	-	34,465	7,601	8,917	953	837	455	36,259
2006	203,545	254,766	867,215	17,820	143,851	9,468	34,099	2,944	2,363	1,273	153,734
2007	91,000	340,000	360,000	19,000	200,000	23,000	45,000	4,300	1,900	2,900	108,710
2008	100,000	99,000	410,000	17,000	85,000	23,000	69,000	47,000	7,200	3,800	86,100
2009	120,000	69,400	245,000	11,000	63,200	10,200	4,500	2,070	1,980	785	52,814
2010	192,000	98,800	351,000	43,500	294,000	19,300	74,900	3,530	1,680	795	107,951
2011	281,000	960,000	547,000	225,000	121,000	16,800	42,500	2,610	3,100	939	219,995
2012	181,000	815,000	357,000	136,000	250,000	27,400	45,900	6,150	1,860	1,280	182,159
2013	296,000	267,000	1,110,000	72,400	209,000	16,400	10,400	4,050	1,480	1,440	198,817
2014	114,000	115,000	399,000	105,000	263,000	19,900	42,500	4,570	935	716	106,462
2015	111,000	97,300	386,000	39,500	82,100	13,100	18,800	2,360	1,200	377	75,174
2016	90,400	87,700	429,000	21,600	86,900	11,300	33,300	2,330	770	356	76,366
2017	110,000	96,700	317,000	21,500	91,900	12,900	16,700	2,220	934	401	67,026

¹ PCB congener concentrations are the sum of the homologues.

² Order of plots indicate increasing distance from SHTC (Plot 11 [100 m] to Plot 71 [23 km]).

Table 8-3: TEQ of PCB congeners in red-backed voles (pg/g) collected from the SHTC study area, 2000 - 2017.

Year	Plot ¹										Average
	11	109	4	110	114	123	117	402	70	71	
2000	500	-	670	-	144	-	33	1.3	6.7	0.06	193.58
2001	108	253	352	18.7	252	15	23.4	0.03	0.01	0.01	102.22
2002	241	346	461	5.1	215	22	53	0.1	0.05	0	134.33
2003	400	385	568	6.1	164	20.4	21.2	0.5	0	0	156.52
2004	94.8	120	836	29.5	3.35	11.5	11.8	0.01	0.02	0.01	110.70
2005	40.6	106	267	-	42.2	4.1	6.4	0.03	0.02	0.01	51.82
2006	369.9	133.2	1039.8	12.3	96.2	9.5	16.7	1.36	0.04	0.02	167.90
2007	119.6	411.2	614.2	7	152.1	18.8	26.4	0.13	0.05	0.03	134.95
2008a ²	85.49	43.97	318.3	5.65	47.07	10.71	41.43	2.4	0.49	0.24	55.58
2008b ³	84.59	42.8	319.02	5.42	45.52	10.42	40.32	2.26	0.47	0.23	55.11
2009	139.16	51.54	279.87	5.11	36.24	6.96	1.71	0.55	0.52	0.26	52.19
2010	146.72	74.46	207.07	22.1	114.18	6.05	18.93	0.02	0.01	0	58.95
2011	88.3	259	438	115	34.9	3.9	7.48	0.01	0.99	0.35	94.79
2012	74.2	313	294	49.3	52.2	5.31	12.7	0.99	0.49	0	80.22
2013	203	224	603	22.5	84.4	5.95	3.12	0.84	0.01	0.01	114.68
2014	86.4	59.4	305	115	57.6	7.57	10.6	1.0	0.28	0.25	64.31
2015	57.2	38.3	335	15.2	38.1	5.85	9.32	0.83	0.56	0.15	50.05
2016	43.5	28.4	289	6	26.1	3.9	8.62	0.54	0.30	0.13	40.65
2017	52.2	41.8	270	10.6	30.6	4.73	5.24	0.87	0.39	0.20	40.57

¹ Order of plots indicate increasing distance from SHTC (Plot 11 [100 m] to Plot 71 [23 km]).

² WHO-TEF: World Health Organization Toxic Equivalency Factor (1998¹¹).

³ WHO-TEF: World Health Organization Toxic Equivalency Factor (2005¹²).

¹¹ WHO (World Health Organization). 1998. Van den Berg, M., et al. 1998, Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife, Environmental Health Perspectives, Volume 106, Number 12, December 1998, pp. 775 – 791.

¹² WHO (World Health Organization). 2005. Van den Berg et al. 2006. The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds. Toxicological Sciences 93(2), 223-241.

Dioxins and Furans

Between May 2016 and May 2017, dioxin and furan concentrations in voles decreased at 8 plots and increased at 2 plots (Table 8-4). The largest declines occurred at plot 4 (178.9 pg/g), plot 11 (73.3 pg/g) and plot 114 (27.3 pg/g) while the largest increase occurred at plot 109 (13.2 pg/g). Changes in dioxin/furan concentrations between 2016 and 2017 at the remaining plots were all <14 pg/g. As has been the case in the past, the highest levels of dioxins/furans in vole tissues occurred at plots 11 through 114 (26 – 309 pg/g) which are located ≤ 0.7 km of the SHTC while the lowest values were recorded at plots 123 through 71 (<16 pg/g), which are located the furthest away (>7.0 km). The congener 23478 PeCDF was the dominant dioxin/furan congener at 5 plots (11, 109, 4, 110, and 123) followed by 2378 TeCDF (plots 114 and 117) and OCDD at 3 plots (402, 70, and 71) in 2017. Overall, there has been a consistent decline in dioxin and furan concentrations in vole tissues at all of the plots in the SHTC study area since 2000.

The 2017 average dioxin/furan TEQ concentration (7.4 pg/g), which is lower than that recorded in 2016 (11.9 pg/g) is the lowest level recorded in the SHTC study area since 2000 (Table 8-5). This represents a continued decreasing trend in dioxin/furan TEQ concentrations in vole tissues that began in 2006 (646.0 pg/g). Concentrations of dioxin/furan TEQs in 2017 at plots 11, 4, 114, 123, 117, and 402 were amongst the lowest levels recorded at those plots since 2000. The congener 23478 PeCDF was by far the most important contributor to dioxin/furan TEQ at 6 of the 10 plots in the SHTC study area in 2017 although 12378 PeCDD was the dominant congener at the 3 plots (402, 70, and 71) located furthest from the SHTC.

Table 8-4: Concentrations of dioxins/furans (pg/g) in red-backed voles collected from the SHTC study area, 2000 - 2017.

Year	Plot ¹										Average
	11	109	4	110	114	123	117	402	70	71	
2000	5757	11026	11827	2229	1585	1840	591	22	110	59	3,504.6
2001	655	2902	9203	460	960	931	1225	8	7	7	1,635.8
2002	3862	4684	6349	86	1550	1533	1017	143	23	6	1,925.3
2003	2994	3938	9432	112	1874	865	273	5	25	4	1,952.2
2004	1177	530	6095	323	677	370	99	n.d. ³	1.6	0.2	927.3
2005	581	1280	2005	- ²	344	155	66	2.8	11	1.3	444.4
2006	8043	648	7633	158	488	345	78	15	22	8	1,743.8
2007	1142	2167	2546	54	912	716	85	29	26	8	768.5
2008	862	373	2316	76	223	266	506	20	36	18	469.6
2009	1013	421	1145	44	145	194	26	7	31	3	302.9
2010	1720	503	434	168	314	43	48	7	3.4	<0.2	324.1
2011	131	312	1,010	438	55.8	22.9	10.2	1	1.9	<0.09	198.3
2012	171	973	1,156	168	139	23	43.1	4.4	15.5	1	269.4
2013	651	732	1,493	126	183	30.6	37	7.7	44.4	7.3	331.2
2014	329	162	781	386	91.8	82.3	27.8	13.7	32.8	7.5	191.4
2015	70	12	472	159	45.4	36.9	32.3	6.6	23.2	3.5	86.1
2016	123	53	488	31	53.8	20.5	15.6	3.7	17.0	9.2	81.5
2017	49.7	66.2	309.1	24.2	26.5	15.9	8.4	4.6	13.1	4.7	52.5

¹ Order of plots indicate increasing distance from SHTC (Plot 11 [100 m] to Plot 71 [23 km]).

² No animals were collected for tissue samples.

³ n.d. - Not Detected. Average values calculated based on 1/2 the reported detection limit.

Table 8-5: TEQ of PCB Congeners (pg/g) in Red-backed Voles Collected from the SHTC Study Area from 2000 to 2017

Year	Plot ¹										Average
	11	109	4	110	114	123	117	402	70	71	
2000	2,200	4,200	4,900	820	600	700	230	7.2	37	20	1,371.4
2001	230	1,100	3,800	160	340	350	440	0.76	2.9	1.2	642.5
2002	1,460	1,750	2,450	26.4	553	593	391	19.8	2.6	1.6	724.7
2003	1,200	1,490	3920	28.6	682	321	89.2	0.7	3.1	0.3	773.5
2004	416	187	2,190	99.5	262	126	31.7	0.79	1.5	0.27	331.5
2005	187	465	754	- ²	104	48.8	17.5	0.81	2	0.43	157.8
2006	3,071	219	2,851	32.5	154	109	19.2	2.2	0.5	1.1	646.0
2007	421	765	885	14	283	274	21	4	3	2	267.2
2008a ³	310	110	830	14	58	87	44	3.6	3.4	0.92	146.1
2008b ⁴	200	71	530	11	40	56	30	2.8	4.5	0.94	94.6
2009	217	81	241	7	24	36	3	1	2	0	61.2
2010	366	100	88	32	58	8	7	1	3	0	66.3
2011	19.3	53.4	234	104	8.6	4.5	2.2	1.3	2	0.4	43.0
2012	21.2	185.0	223.6	27.56	19.69	4.48	6.84	0.76	2.94	0.18	49.2
2013	121.2	129.5	197.7	17	20.3	4	3.8	0.5	4.8	1.4	50.0
2014	53.9	22.2	133	81.3	13.0	12.1	2.92	1.4	2.81	0.803	32.3
2015	7.26	1.62	75.9	19.2	4.66	5.01	4.04	0.565	2.59	0.378	12.1
2016	14.8	6.54	80.8	3.4	5.59	2.79	1.73	0.488	1.97	0.745	11.9
2017	5.38	8.71	46.8	4.27	3.03	1.99	0.70	0.53	1.94	0.55	7.4

¹ Order of plots indicate increasing distance from SHTC (Plot 11 [100 m] to Plot 71 [23 km]).

² WHO-TEF: World Health Organization Toxic Equivalency Factor (1998¹³).

³ WHO-TEF: World Health Organization Toxic Equivalency Factor (2005¹⁴).

¹³ WHO (World Health Organization). 1998. Van den Berg, M., et al. 1998, Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife, Environmental Health Perspectives, Volume 106, Number 12, December 1998, pp. 775 – 791.

¹⁴ WHO (World Health Organization). 2005. Van den Berg et al. 2006. The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds. Toxicological Sciences 93(2), 223-241.

Total TEQ

PCB TEQs and dioxin/furan TEQs both declined between 2016 and 2017, resulting in an overall 7.2% (-37.8 pg/g) decrease in total TEQs (PCB TEQs + dioxin/furan TEQs) across all 10 plots. On an individual plot basis, total TEQs declined at 5 (plots 11, 4, 117, 70, and 71) of the 10 plots, increased at 3 plots (109, 110, and 402), and remained the same at 2 plots (114 and 123) year-over-year. The largest increase in total TEQ concentration in 2017 occurred at plot 109 (16.0 pg/g or 45.7%) while the largest decrease was recorded at plot 4 (53.0 pg/g or -14.3%). The overall trend for total TEQs in voles collected from plots ≤ 2 km of the SHTC and >2 km has been to decrease between 2000 and 2017 (Figure 8-3). Both distance categories reached the lowest average total TEQ concentrations recorded in the SHTC study area in 2009 and have remained stable and/or lower since then. In 2017, the mean total TEQ decreased slightly at plots located >2 km from the SHTC and for those located ≤ 2 km (Figure 8-3). In addition, the total TEQ for plots ≤ 2 km from the SHTC in 2017 represents the lowest concentration recorded at these plots since 2000 (Figure 1-4). As in previous years, the mean total TEQ for 2017 at more distant plots (mean = 2.6 pg/g) was an order of magnitude less than that for plots located near the SHTC (mean = 78.3 pg/g).

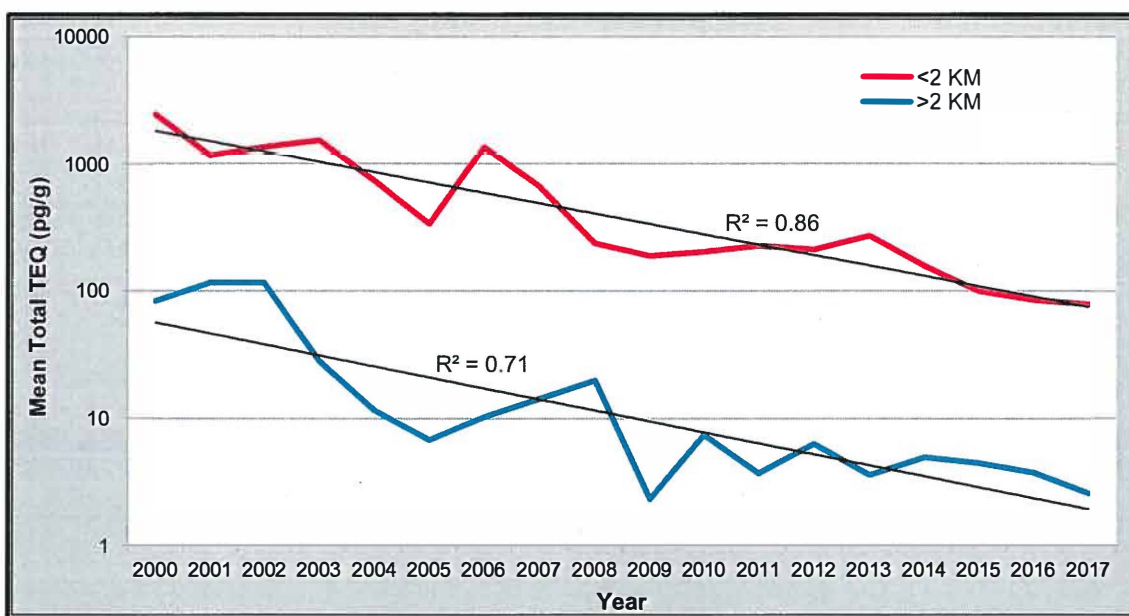


Figure 8-3: Mean total TEQ Concentrations at Plots within 2 km and more than 2 km from the SHTC

8.3 *Conclusions*

Between 1991 and 2015, average red-backed vole densities in the SHTC area have varied between 1.9 (2000) and 18.8 (2013) voles/ha in June, and between 4.9 (2011) and 37.5 (2013) voles/ha in September. However, vole populations in the SHTC area reached their highest average densities ever recorded for June (19.2 voles/ha) and September (39.8 voles/ha) during the 2016 vole monitoring program. These densities were 2.4 and 2.3 times higher than the respective 25 year average vole densities for June (8.2 voles/ha) and September (17.5 voles/ha). However, in 2017, June vole densities were within the historical ranges for all 3 plots while plots 11 and 70 fell to the lowest recorded September densities since 1991. The September vole density at plot 114 also declined in 2017 but was in within the historical ranges previously recorded for this plot.

The results of the 2017 monitoring program indicate that overall concentrations of PCB congeners and PCB TEQs decreased in red-backed vole tissues from 2016 levels in the SHTC study area. Similarly, mean dioxin/furan congeners and TEQs both decreased between May 2016 and May 2017. Mean dioxin/furan congener and TEQ concentrations recorded in 2017 represent the lowest concentrations on record since monitoring for these chemicals began in 2000.

Historically, the highest total TEQ concentrations were generally associated with voles captured at plots (11, 109, 4, 110 and 114) near the SHTC (≤ 0.7 km). In 2017, the highest total TEQ concentration was recorded at plot 4 while those at plot 11, 109, 110, and 114 were considerably lower. Total TEQ concentrations in 2017 continued to remain low at plots 402, 70 and 71, which are located farthest from the SHTC. The results of the regression analyses for chemical TEQs indicated that PCB TEQ, dioxin/furan TEQ, and total TEQ concentrations all significantly declined as distance from the SHTC increased although there were no significant relationships between TEQ values and prevailing wind direction.

As has been the case in past monitoring years, operation of the SHTC did not appear to influence red-backed vole demography despite elevated levels of congener PCBs and dioxins/furans in vole tissues collected from plots near the plant. All 3 population monitoring plots exhibited large decreases in vole density in both June and September 2017. It appears that following the peak in red-backed vole populations in the SHTC study area in 2016, vole populations decreased dramatically in 2017. Based on historic population trends in the vicinity of the SHTC, red-backed voles are likely to begin the increase phase of their population cycle in 2018.

9 Toxicology

A toxicological assessment of the monitoring results is conducted annually to assess potential environmental and human health risk. The scope includes a review of the red-backed vole results to assess potential impacts to vole populations and a review of the fish monitoring data to assess potential human health risks from exposure through consumption of fish from Chrystina Lake.

9.1 Voles

The toxicological significance of polychlorinated biphenyls (PCB), polychlorinated dibenzodioxin and polychlorinated dibenzofuran (PCDD/F) concentrations measured in southern red-backed voles trapped in the vicinity of the Swan Hills Treatment Centre (SHTC) have been assessed since the early 1990s. At the 2004 annual Stakeholders Meeting it was noted that since the results of the assessment had not changed for several years, a full toxicological evaluation of the vole tissue data would be unnecessary unless one or more of the following conditions was met: (i) vole tissue concentrations exceeded historic levels; (ii) new toxicological information were available that resulted in a revision to assumed toxicity endpoints; or (iii) different chemicals of concern (i.e., other than PCB, PCDD/F) were identified at elevated concentrations in vole tissue.

The 2017 vole toxicological assessment, based on a review of the organic contaminant tissue concentrations and a literature review of PCB and PCDD/F toxicity in voles or laboratory rodents, resulted in the following findings and conclusions:

- The results of the 2017 monitoring program indicate that concentrations of PCBs, dioxins and furans declined on average compared to the 2016 results. PCB and total TEQ concentrations remained well within the historic range of values measured between 2000 and 2016.
- Toxicity endpoints (lowest-observable-adverse-effects levels [LOAELs]) identified for previous vole assessments are still considered valid.
- Previous years inorganic elements analyses in voles exhibited no apparent trend in relation to distance from the SHTC. Thus, that component of vole monitoring was not conducted in 2017, but will be conducted for the expanded monitoring program conducted at five year intervals.

It was concluded that a full toxicological assessment of the 2017 vole tissue data was not necessary, and that the conclusions from previous assessments still apply. Additionally, as in previous years, results

from the vole monitoring program conducted by Wildland Management Consultants in 2017 (WMC 2018¹⁵) concluded that there was no evidence that the operation of the SHTC is affecting red-backed vole populations. Changes in vole population density appear to be related to natural cycles of red-backed vole populations, as well as habitat structure and quality at the various sites.

¹⁵ Wildland Management Consultants Ltd. 2018. Swan Hills Waste Treatment Centre: 2017 Wildlife Monitoring Program. SUEZ Canada Waste Services Inc. March 2018

9.2 Fish

The objective of this annual human health risk assessment involved identification of potential human health risks associated with consumption of fish from Chrystina Lake and Edith Lake based on measured tissue concentrations of PCB, PCDD, and PCDF. Risks were estimated to fish consumers based on measured PCB and total TEQ concentrations. The scope of the risk assessment included the following:

- Comparison of measured concentrations to previous year's concentrations measured in brook trout sampled from Chrystina Lake and Edith Lake;
- Comparison of measured concentrations to those measured in fish in freshwater lakes and rivers in North America; Comparison of measured concentrations to those measured in freshwater and farmed fish in Canadian and U.S. supermarkets;
- Determination of potential human health risks resulting from consumption of Chrystina Lake and Edith Lake fish, based on Health Canada's current human exposure limits.
- 2017 fish chemistry tissue concentrations are summarized in table 9-1.

Table 9-1: Weighted Average Concentration of PCBs (µg/kg (ppb)) and 2,3,7,8-TCDD TEQ (pg/g (ppt)) in Brook Trout in Chrystina and Edith lakes, and Fish Hatchery (2017)

<i>Fish Species</i>	<i>Age Class</i>	<i>No. of Samples</i>	<i>Fish per sample</i>	<i>PCB Sample Conc.</i>	<i>Weighted PCBs µg/kg (ppb)*</i>	<i>PCB-TEQ Sample Conc.</i>	<i>Weighted PCB-TEQ</i>	<i>PCDD-F TEQ Sample Conc.</i>	<i>Weighted PCDD-F TEQ Sample Conc.</i>	<i>Total TEQ Sample Conc.</i>	<i>Weighted Total TEQ pg/g (ppt)*</i>
Chrystina Lake											
Brook trout	1+ years	1	3	9.06	27.18	0.2436	0.7308	0.1282	0.3846	0.3718	1.1154
Brook trout	2+ years	1	1 3	15.3 19.4	15.3 58.2	0.6072 0.4738	0.6072 1.4214	0.1675 0.1595	0.1675 0.4785	0.7747 0.6333	0.7747 1.8999
Brook trout	3+ years	1	3 3	25.4 27.1	76.2 81.3	0.9198 0.9732	2.7594 2.9196	0.1832 0.1929	0.5496 0.5787	1.1029 1.1661	3.3087 3.4983
Brook trout	4+ years	1	1	42.4	42.4	1.6449	1.6449	0.2938	0.2938	1.9387	1.9387
Brook trout	5+ yrs	1	1 Re-sample	129.0 91.4	110.2 (After re-sample)	7.372 5.2979	6.335 (After re-sample)	0.3448 0.3448	0.3448 (After re-sample)	7.7167 5.6427	6.6797 (After re-sample)
Weighted Average					27.39		1.0945		0.1865		1.2810
Edith lake											
Brook trout	1+ years	1	3	11.1	33.3	0.1487	0.4461	0.2377	0.7131	0.3864	1.1592
Brook trout	2+ years	1	3	4.8	14.4	0.0647	0.1941	0.0936	0.2808	0.1583	0.4749
Brook trout	3+ years	1	3 3	8.82 8.06	26.46 24.18	0.3472 0.3374	1.0416 1.0122	0.1152 0.1409	0.3456 0.4227	0.4624 0.4783	1.3872 1.4349
Brook trout	4+ years	1	1	10.2	10.2	0.4018	0.4018	0.126	0.126	0.5277	0.5277
Weighted Average					8.35		0.2381		0.1453		0.3834
Fish hatchery											
Brook trout	< 1 year	1	10	8.40	8.40	0.1071	0.1071	0.1071	0.1416	0.1071	0.2487

9.2.1 Comparison of Measured 2017 Brook Trout PCB and TEQ Concentrations to Supermarket Measurements

Weighted average measurements of PCBs ($\mu\text{g/kg}$) and total TEQ (pg/g) in Chrystina and Edith lakes compared to average concentrations measured in supermarket fish in North America are summarized in table 9-2.

Table 9-2: PCBs and Total TEQ in Brook Trout Compared to Measurements in Supermarket Fish

	PCBs ($\mu\text{g/kg}$)	Total TEQ (pg/g)
Chrystina Lake	27.4	1.28
Edith Lake	8.4	0.38
Farmed Salmon	6-51	0.92-1.2
Farmed Trout	11.3-24	0.6-1.4
Wild Salmon - Canada	1.8-12.6	0.02-0.20
Wild Salmon – U.S.	3.6-8.1	0.36
Wild Freshwater or Finfish – Cdn	2.8-8.0	0.05-1.04
Wild Freshwater Fish – U.S.	165.9	11.8

Based on measurements of fresh fish from Canadian and US supermarkets from 2002 to 2006, average PCB concentrations in Chrystina and Edith Lake brook trout (27.4 and 8.4 $\mu\text{g/kg}$) were:

- Similar to average measurements in Canadian farmed salmon (6-51 $\mu\text{g/kg}$), and farmed trout (11.3-24 $\mu\text{g/kg}$),
- Similar (Edith) or greater (Chrystina) than average measurements in wild salmon in Canada (1.8-12.6 $\mu\text{g/kg}$) or the U.S. (3.6-8.1 $\mu\text{g/kg}$) and wild freshwater or finfish from Canadian supermarkets (2.8-8.0 $\mu\text{g/kg}$), and
- Lower than the average measurements in wild freshwater fish from U.S. supermarkets (165.9 $\mu\text{g/kg}$).

Average total TEQ concentrations in Chrystina Lake (1.28 pg/g) and Edith Lake (0.38 pg/g) were:

- Similar to average concentrations in Canadian farmed salmon or trout (0.6-1.4 pg/g),
- Similar (Edith) or greater (Chrystina) to average concentrations in wild freshwater fish from Canadian supermarkets (0.05-1.04 pg/g), and
- Lower than the average concentration reported in wild freshwater fish from U.S. supermarkets (11.8 pg/g), but higher (Chrystina Lake) than average concentrations reported in wild salmon in Canada (0.02-0.20) or the U.S. (0.36).

9.2.2 Comparison of Measured 2017 Brook Trout PCB and TEQ to Measurements in Other Lakes

Weighted average measurements of PCB ($\mu\text{g/kg}$) in Chrystina and Edith lakes compared to average concentrations measured in other freshwater lakes in North America are summarized in table 9-3.

Table 9-3: PCBs ($\mu\text{g/kg}$) in Brook Trout Compared to Measurements in Fish from Other Lakes

Location	Concentration ($\mu\text{g/kg}$)
Chrystina Lake	27.4
Edith Lake	8.4
Great Lakes	200-900
St. Lawrence River	169-326
Washington State Lakes	33.6-200
U.S. National Rivers	47.1
U.S National Lakes	13.9

Average Chrystina Lake and Edith Lake PCB concentrations in 2017 (27.4 and 8.4 $\mu\text{g/kg}$) were:

- considerably less than average PCB measurements in fish from the Great Lakes (200 to 920 $\mu\text{g/kg}$) in the period 2006 to 2013,
- considerably lower than average PCB measurements in whole white suckers from the St. Lawrence River in 2002-07 (169-326 $\mu\text{g/kg}$),
- lower than average PCB concentrations measured in fish from 3 areas of Washington State (33.6-200 $\mu\text{g/kg}$, 2013), and 540 U.S. rivers (47.1 $\mu\text{g/kg}$), and
- similar to (Edith) or greater than (Chrystina) the median concentration reported in 500 randomly selected U.S. lakes (13.9 $\mu\text{g/kg}$) in years 2000 to 2013.

Weighted average measurements of PCB-TEQ, PCDD/F TEQ and total TEQ (pg/g) in Chrystina and Edith lakes compared to average concentrations measured in other freshwater lakes in North America are summarized in table 9-4.

Table: 9-4: TEQ ($\mu\text{g/kg}$) in Brook Trout Compared to Measurements in Fish from Other Lakes

Location	Concentration (pg/g)		
	PCB-TEQ	PCDD/F-TEQ	Total TEQ
Chrystina Lake	1.09	0.19	1.28
Edith Lake	0.24	0.15	0.38
Great Lakes	2.0-41.1	0.7-8.4	5.4-42.2
Washington State Lakes		0.12-0.72	
U.S National Lakes		0.41	

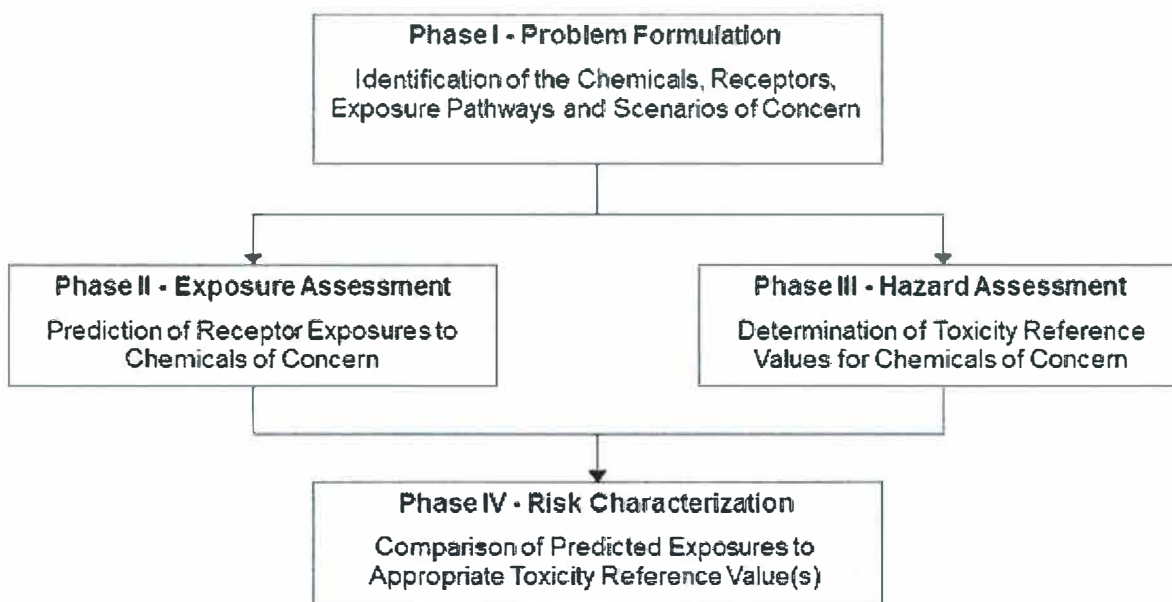
Average total TEQ concentrations in Chrystina and Edith Lake fish (1.28 and 0.38 pg/g) were considerably lower than average concentrations reported in various fish from the Great Lakes in 2006-2014 (7.3-46.3 pg/g).

PCB-TEQ concentrations in both lakes (1.09 and 0.24 pg/g) were lower than average PCB-TEQ concentrations measured in fish from the Great Lakes in 2006-2014 (2.0-41 pg/g).

PCDD/F TEQ concentrations (0.19 and 0.15 pg/g) were lower than those measured in fish from the Great Lakes in 2006-2014 (0.7-8.4 pg/g) and similar to those measured in fish from Washington State lakes (0.12-0.72) and 500 randomly selected national lakes (0.41) in years 2000 to 2013.

9.2.3 Risk Assessment of Fish Consumption from Chrystina and Edith Lakes

As in previous years the risk assessment was based on the model depicted below.



The exposure assessment (Phase II) involved estimating the amounts of PCBs and PCDD/F Toxic Equivalent (TEQ) potentially ingested by individuals daily. For the risk assessment, non-detected PCB and PCDD/PCDF congener concentrations were assumed to be equivalent to one-half of the detection limit (ND= 0.5 DL).

Assumed fish consumption rates and average body weight of adults correspond to those determined in the diet and activity survey conducted in Swan Hills by Alberta Health (1997).

Body weight:	73 kg
Fish consumption rates:	167 g/day (high consumer)
	47 g/day (medium consumer)
	13 g/day (low consumer)
	2 g/day (very low consumer)

A separate exposure assessment was conducted for toddlers (aged 1-4 years), children (aged 5-11) and adolescents (aged 12-19) based on fish consumption rates recommended by Health Canada for these age groups and high fish consuming populations. These rates were 20, 33 and 40 grams/day, respectively (Health Canada, 2007).

Alberta Health has compiled fish advisories for water bodies within 20 km of Swan Hills. This would include both Chrystina and Edith lakes. Recommended consumption limit for brook trout is two – 75 gram servings per week (average daily intake about 22 grams). These consumption rates were applied in the risk assessment.

From the Phase III hazard (or toxicity) assessment, the following exposure limits (tolerable daily intakes), established by Health Canada (2009) were applied:

- PCBs: 0.13 µg/kg bw/day
- PCDD/PCDF: 70 pg/kg bw/month (2.3 pg/kg/day).

For risk characterization, Exposure Ratios (ERs) of potential health risks were calculated by dividing the estimated exposure by the respective exposure limit, as shown below.

$$ER = \frac{\text{Estimated Exposure}}{\text{Exposure Limit}}$$

Interpretation of ER values was as follows:

- ER < 1.0. Signifies that the estimated exposure from fish consumption is less than the exposure limit (i.e., tolerable level of exposure) and no adverse health effects would be expected.
- ER > 1.0 and < 10. Signifies the low likelihood of potential adverse human health effects, the significance of which must be balanced against the degree of conservatism incorporated in the assessment.
- ER > 10. Signifies a higher likelihood of potential adverse health effects. Efforts should be directed at mitigating the risk through various risk management measures.

9.2.4 Risk Estimates Based on Total PCB Concentrations in Fish (Adults)

Table 9-5: PCB Exposure Ratios – Consumption of Chrystina Lake brook trout in 2017

<i>Consumer Class</i>	<i>Maximum PCBs</i>		<i>Average PCB</i>	
	<i>Health Canada Tolerable Daily Intake</i>		<i>Health Canada Tolerable Daily Intake</i>	
	<i>Without Background</i>	<i>With Background</i>	<i>Without Background</i>	<i>With Background</i>
High (167 g/d)	1.94	1.95	0.48	0.50
Medium (47 g/d)	0.55	0.56	0.14	0.15
Low (13 g/d)	0.15	0.17	0.04	0.05
Very Low (2 g/d)	0.02	0.04	0.06	0.02
Fishing regs (22 g/d)	0.26	0.27	0.006	0.08

Table 9-6: PCB Exposure Ratios – Consumption of Edith Lake brook trout in 2017

<i>Consumer Class</i>	<i>Maximum PCB</i>		<i>Average PCB</i>	
	<i>Health Canada Tolerable Daily Intake</i>		<i>Health Canada Tolerable Daily Intake</i>	
	<i>Without Background</i>	<i>With Background</i>	<i>Without Background</i>	<i>With Background</i>
High (167 g/d)	0.20	0.21	0.15	0.16
Medium (47 g/d)	0.05	0.07	0.04	0.06
Low (13 g/d)	0.02	0.03	0.01	0.03
Very Low (2 g/d)	0.002	0.02	0.002	0.02
Fishing regs (22 g/d)	0.03	0.04	0.02	0.04

9.2.5 Risk Estimates Based on Total TEQ Concentrations in Fish (Adults)

Table 9-7: TEQ Exposure Ratios – Consumption of Chrystina Lake brook trout in 2017

<i>Consumer Class</i>	<i>Maximum Total TEQ</i>		<i>Average Total TEQ</i>	
	<i>Without Background</i>	<i>With Background</i>	<i>Without Background</i>	<i>With Background</i>
High (167 g/d)	6.64	6.86	1.27	1.49
Medium (47 g/d)	1.87	2.09	0.36	0.58
Low (13 g/d)	0.52	0.73	0.10	0.32
Very Low (2 g/d)	0.08	0.30	0.02	0.23
Fishing regs (22 g/d)	0.88	1.10	0.17	0.39

Table 9-8: TEQ Exposure Ratios – Consumption of Edith Lake brook trout in 2017

<i>Consumer Class</i>	<i>Maximum Total TEQ</i>		<i>Average Total TEQ</i>	
	<i>Without Background</i>	<i>With Background</i>	<i>Without Background</i>	<i>With Background</i>
High (167 g/d)	0.53	0.74	0.38	0.60
Medium (47 g/d)	0.15	0.37	0.11	0.32
Low (13 g/d)	0.04	0.26	0.03	0.25
Very Low (2 g/d)	0.01	0.22	0.005	0.22
Fishing regs (22 g/d)	0.07	0.29	0.05	0.27

9.2.6 Risk Estimates for Children and Adolescents

Table 9-9: Average PCB and TEQ Exposure Ratios for Children and Adolescents: Chrystina Lake

<i>Consumer Class</i>	<i>Average PCB</i>		<i>Average Total TEQ</i>	
	<i>Without Background</i>	<i>With Background</i>	<i>Without Background</i>	<i>With Background</i>
Adolescent (12-19 yr)	0.15	0.16	0.34	0.62
Child (5-11 yr)	0.26	0.28	0.52	0.95
Toddler (7 m – 4 yr)	0.32	0.38	0.73	1.55

Table 9-10: Average PCB and TEQ Exposure Ratios for Children and Adolescents: Edith Lake

<i>Consumer Class</i>	<i>Average PCB</i>		<i>Average Total TEQ</i>	
	<i>Without Background</i>	<i>With Background</i>	<i>Without Background</i>	<i>With Background</i>
Adolescent (12-19 yr)	0.05	0.06	0.10	0.38
Child (5-11 yr)	0.08	0.11	0.16	0.59
Toddler (7 m – 4 yr)	0.10	0.15	0.22	1.04

9.2.7 Relative PCB and TEQ Risk Estimates since 2002 (Adults)

Average PCB and total TEQ concentration ERs for high fish consumers from 2002 to 2016 are shown in Figures 9-1 and 9-2.

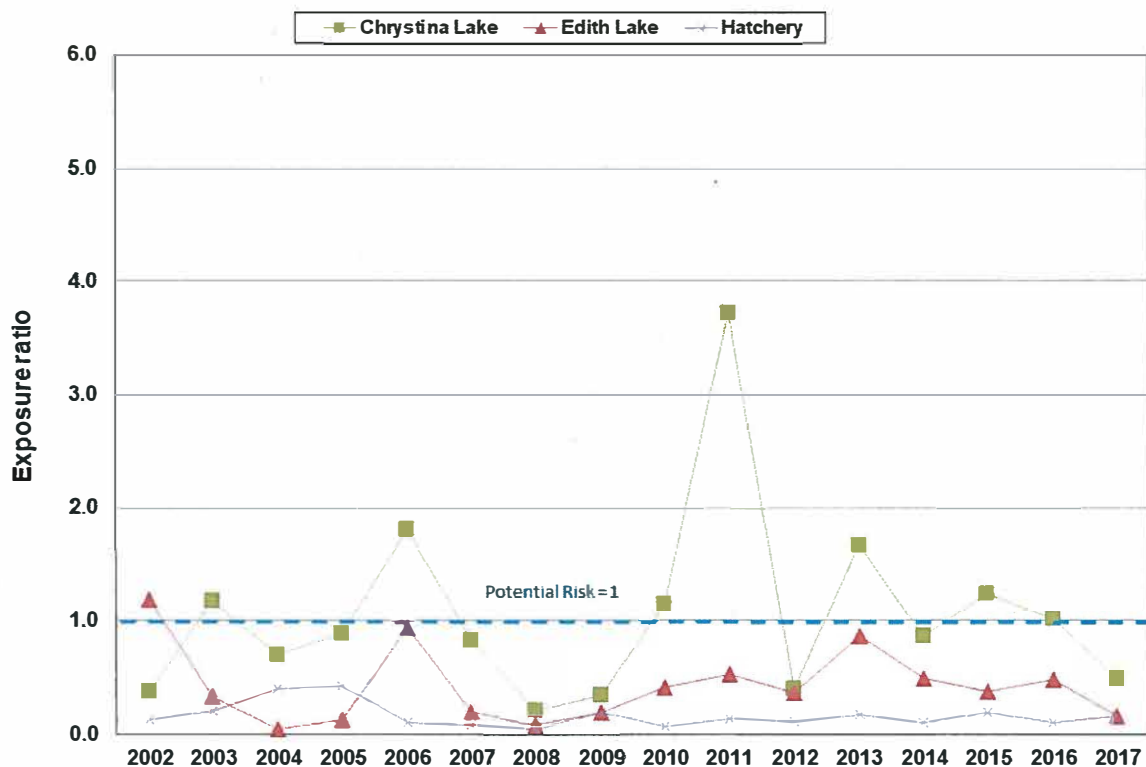


Figure 9-1: Predicted ERs for High Fish Consumers with Average Total PCB (2002-2017)

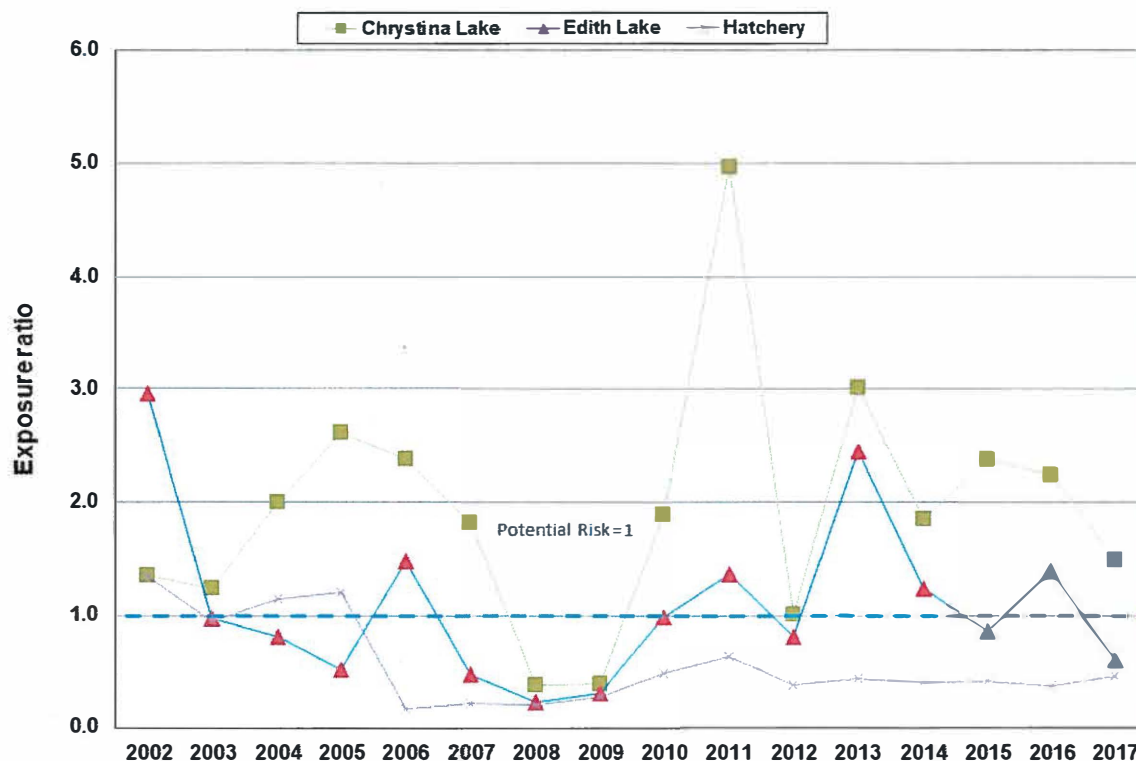


Figure 9-2: Predicted ERs for High Fish Consumers with Average Total TEQ (2002-2017)

9.2.8 Summary

Only one five-year old Brook trout from Chrystina Lake exhibited relatively high PCB and total TEQ concentrations compared to other fish in both lakes.

PCB exposure ratios for this individual fish:

- 1.95 for high adult consumer (167 g/d)
- 0.56 or less for all other adult consumer quantities

Total TEQ exposure ratios for this individual fish:

- 6.86 for high adult consumer (167 g/d)
- 2.09 for medium fish consumer (47 g/d)
- 0.73 or less for all other adult consumer quantities

ERs per fishing regulations advisory (22 g/d) for this individual fish:

- 0.27 PCB adults
- 1.09 total TEQ adults

Since only one five-year old fish from Chrystina Lake exhibited elevated ERs between 1 and 10, no adverse health effects are expected since consumers would not be chronically exposed to the maximum concentrations measured in this individual fish. Instead, ERs calculated for weighted average measured concentrations are realistic representations of risk from chronic fish consumption.

Exposure ratios (ER's) based on the weighted average concentrations were mainly less than 1.0, as summarized below.

PCB concentration in Chrystina Lake fish exhibited ERs of:

- 0.50 or less for all adult consumers.
- 0.16 (adolescent) to 0.38(toddler).

Total TEQ concentration in Chrystina Lake fish exhibited ERs of:

- 1.49 for an adult high consumer, and 0.58 for a medium consumer.
- 0.62 (adolescent) to 1.55 (toddler, or 0.73 without background).

Based on the 2017 results, there is no increased risk for consumers of Edith lake fish compared to eating fish from other North American lakes and supermarkets.

PCB concentration within Edith Lake fish exhibited ERs of:

- 0.16 or less for all adult consumers.
- 0.06 (adolescent) to 0.15 (toddler).

Total TEQ concentration within Edith Lake fish exhibited ERs of:

- 0.60 or less for all adult consumers.
- 0.38 (adolescent) to 1.04 (toddler).

9.2.9 *Conclusions and Recommendations*

ERs > 1 and < 10 exhibit a low likelihood of potential adverse human health effects, based on several conservative assumptions used in the exposure calculations (high fish consumers, maximum chemical concentrations, skin on fish fillets) and the safety factors in the exposure limits (10 for TEQ, 100 for PCBs). However, precautions are suggested as follows:

- Alberta fishing regulations fish consumption advisory of 150 grams per week of fish from lakes within 20 km of Swan Hills, which includes both Chrystina and Edith lakes, should be adhered to.
- Although adherence to the fishing regulations consumption advisory is protective of potential health effects, catch and release of large fish above 12 inches (25 cm) or 1 pound (454 grams) may further reduce risk (ER < 1) for regular fish consumers.
- Consumption of fish by toddlers should be lower than the fishing advisory, although background is contributing approximately one half of the risk. A consumption rate of 75 grams per week is recommended for toddlers only.
- Fish skins should always be removed before cooking and not eaten, since the fatty skin layer contains higher concentrations of PCBs, dioxins and furans than the bare fillets alone.
- Since infants may be exposed to chemicals of concern through breastfeeding, pregnant or breastfeeding women should avoid eating fish from Chrystina and Edith lakes.

10 2018 Monitoring Program

The Swan Hills Treatment Centre (SHTC) conducts a comprehensive environmental monitoring program in accordance with Section 4.8 of Approval 1744-02-01. Program results are reviewed annually with regional stakeholders and Alberta Environment and Parks (AEP). The program is revised as necessary to address both monitoring results and program recommendations.

The monitoring program scope was rationalized in 2000 and a commitment was made to conduct expanded monitoring every five years to ensure that the current program continues to provide both relevant and reliable data regarding potential impacts of SHTC operations on the environment. Expanded monitoring was last conducted in 2014 and will be scheduled again in 2019. The 2018 monitoring program will be consistent with the scope of previous “standard” monitoring years, incorporating any recommended changes as outlined in the following sections.

10.1 Proposed Changes for 2018

Preliminary 2017 monitoring program results were reviewed at the Technical Meeting held on January 25, 2018 at the Alberta Environment and Parks (AEP) regional office in Spruce Grove. Participants at this meeting included SUEZ staff, program consultants, and representatives from AEP and Alberta Health. Although no significant scope changes were recommended, some modifications to the program will be implemented in 2018 based on the review comments. The proposed 2018 Monitoring Program Scope is consistent with previous monitoring efforts and will incorporate the following changes:

- The scope of the air and groundwater monitoring programs is defined in the operating Approval and the 2017 program will continue to meet those requirements.
- Collection of sandstone interval water samples has been limited, particularly upgradient of the SHTC. Options are being reviewed and new upgradient sandstone monitors will be installed in 2018.
- A review of options for expanding the analytical scope of the groundwater program will be conducted and recommendations made for implementation in the expanded monitoring cycle (2019). Some additional parameters may be included in the 2018 program at selected sites to evaluate applicability.

- Wildlife, soils, surface water and fish monitoring programs and the toxicology assessment program will continue to follow the standard program scope with minimal change.
- A modified Moss Bag protocol (employing acid-washed media) will be further evaluated as part of the 2018 vegetation monitoring.
- Stream and lake sediments are now sampled every two and will be included in the 2018 program. The stream and lake sediments were also sampled in the 2017 program to provide supplemental data for the sediment core sample that was collected from Lesser Slave Lake the week of March 12-16, 2018. This sample will be aged and PCB analyses conducted from selected depths to collect historical depositional data. This sampling is being conducted in response to concerns raised during the Approval renewal process.
- Program “Triggers” will be reviewed and updated to better accommodate changes in the standard program scope that have been introduced.

In response to comments raised at the technical meeting, additional work will be conducted in 2018 to review the analytical scope for implementation in expanded monitoring years. Changes have occurred in the types of wastes received and treated at the SHTC and some “legacy” wastes such as PCBs no longer represent a dominant waste stream. A strategy will be developed to ensure potential emerging contaminant issues are identified and incorporated in the program as appropriate. This program will include the following:

- Comprehensive review of waste receipts to identify any potential emerging contaminant issues
- Better coordination with related on-site reporting and monitoring programs including spill reporting/response, industrial runoff monitoring and soil management programs
- Review of analytical methods to identify options that can be employed as sensitive “indicators” covering a wider range of contaminant issues; and
- develop a strategy to conduct broader environmental quality surveillance as part of the expanded program that will be conducted in 2019.

Details regarding the proposed scope of the 2018 monitoring program for all components are provided in the following sections.

10.2 Air Monitoring

The scope of the air monitoring program for 2018 is defined in the SHTC Operating Approval (Approval No. 1744-02-01). Monitoring locations and parameters remain the same as in the past however, the frequency of sampling was reduced commencing in 2006 in accordance with the Approval. The standard program for 2018 will include the following components:

- Ambient PCB monitoring at 5 locations (sites 1, 2A, 5A, E1 and 11) on a monthly basis;
- Particulate monitoring (TSP) at 2 locations (sites 1 and 9) on a monthly basis; and
- Annual process area THC and VOC monitoring at one location (Site E1, Organic Tank Farm)

The scope of the ambient air monitoring program has typically not changed from year to year. The 2018 air quality monitoring program will continue to meet the Approval requirements as specified above and no additional work is proposed.

10.3 Groundwater

The scope of the ground water monitoring program is consistent with the requirements of Section 4.6 of Approval 1744-02-01 and no significant changes are recommended for 2018. Limited groundwater samples were obtained from the sandstone aquifer in 2017, notably upgradient of the facility. Replacement sandstone wells will be drilled in 2018 to provide more effective and consistent monitoring of this aquifer.

The analytical scope will be reviewed and the addition of some “indicator” analyses may be implemented at a few select locations in 2018 to evaluate their applicability for implementation as an expanded monitoring strategy.

All wells will be sampled in September 2018 and analyzed for the same parameters as in previous years. Data QA/QC reporting and follow-up on data anomalies, if necessary, will be conducted in accordance with the Groundwater Incident Response Plan, on file with AEP.

10.4 Soils and Vegetation

Soil and vegetation monitoring for 2018 will continue with the standard program as outlined below:

Soil

- Collection of live moss at 10 monitoring sites as shown in Figure 2 (plots 4, 11, 28, 70, 71, 109, 110, 114, 117, 123, and 402); and
- Analysis of samples for routine parameters (pH and conductivity); non-routine parameters (metals by ICP scan); and organic parameters consisting of total PCBs, congener-specific PCBs and dioxins/furans.

Vegetation

- Collection of vegetation samples (Labrador tea) at the same 10 plots employed in the soils program; and
- Analysis of Labrador tea samples for the same parameters included historically.

Analysis of moss bag samples and assessment of lichen health will be conducted during the 2018 program. Moss bags were deployed in 2016 and are exposed for 2 years. These samples will be collected for analysis along with three “acid washed” moss bags deployed at plots MB4, MB5 and MB15 in 2017. Duplicate samples (conventional and “acid washed” moss bags) will be deployed at all 15 sites for further assessment of the modified method in 2019 (following a one year exposure period).

Samples will be collected in late May or early June 2018 consistent with the revised schedule that was implemented in 2006.

10.5 Surface Water, Sediment and Fish

The scope of the 2018 program will include the following standard components:

Water Monitoring

- Collection of surface water samples from Chrystina Lake, Edith Lake and the Coutts River (Site S5a) and analyzed for the same parameters as previous years.

Sediment Monitoring

- Stream and lake sediment sampling is now conducted every two years and will be included in the 2018 program. Stream and lake sediments were also sampled in the 2017 program to provide supplemental data for the sediment core sample that was collected from Lesser Slave Lake the week of March 12-16, 2018. This sample will be aged and PCB analyses conducted from selected depths to collect historical depositional data. This sampling is being conducted in response to concerns raised during the Approval renewal process.

Fish Monitoring

- Collection of brook trout samples from Chrystina Lake and Edith Lake;
- Analysis of age-group composite samples for metals and organic compounds; and
- Archiving white sucker tissue samples collected from Chrystina Lake for potential future analysis as directed.

In addition, the following work is recommended for inclusion in the 2018 program:

- Continue with the use of coded metal tags to improve ageing of fish samples; and
- Review sampling methodology to specifically target collection of older fish.
- Investigate the use of alternative statistical methods to better assess potential inorganic trends where sufficient data are available

10.6 Wildlife

No significant changes to the standard program, regarding population monitoring, tissue collection or analytical scope, are recommended for 2018. The program will include:

- Collection and analysis of red-backed vole tissue samples at 10 monitoring sites (plots 4, 9, 10, 11, 70, 71, 114, 117, 123, and 402); and
- Population monitoring at plots 11, 114 and 70 in June and September

Similar to the past several years, the following data review and interpretation procedures will be implemented:

- June population monitoring results will be interpreted immediately following completion of the field program; and
- Tissue chemistry results will be reviewed as soon as they are available and interpreted relative to the June population results.

10.7 Toxicology

Similar to previous years, an assessment of vole tissue levels will be conducted only if any of the following conditions occurs:

- Vole tissue levels exceed historic high levels;
- New toxicological information becomes available (i.e. significant change in end-point toxicity of the compounds of interest); and
- Any new compounds are identified at elevated levels in animal tissue.

The current levels of PCBs, dioxins and furans observed in environmental samples are typically well below historical maximum levels which have already been assessed.

The annual human health risk assessment, based on consumption of fish, will be retained for 2018. As requested previously, assessment of sub-adult life stages will continue to be included in the human health risk assessment.

10.8 Triggers

The concept of triggers was introduced in 2000 to support rationalization of the program at that time. They establish specific criteria that will require additional monitoring work to be conducted in response to any exceedance of the recommended trigger condition.

The triggers for the 2018 environmental monitoring program are consistent with those applied in previous years and have been updated to incorporate changes in monitoring schedules. Table 10-1 provides a summary of the triggers and the associated program response that will be implemented for 2018.

Table 10-1: Environmental Monitoring Triggers for 2018

Component	Trigger	Response - Additional Monitoring Work
Operations	A facility upset resulting in off-site emissions of significant magnitude to warrant immediate assessment.	Soil and vegetation monitoring to proceed at selected sites immediately following incident. The number of sites and scope of the analytical work would be based on meteorological conditions and the nature of the release. Additional sampling of vole tissue - timing, sample locations and analytical scope would be determined based on meteorological conditions and the nature of the release. Initiate immediate snow pack sampling if appropriate.
Ambient Air Quality	PCB concentration exceeds 150 ng/m ³ at fenceline monitoring location(s).	Investigate potential sources of fugitive emissions and increase frequency of PCB air monitoring to NAPS cycle – once every 6 days. If levels persist, the following additional steps will be considered: <ul style="list-style-type: none"> Ambient PCB monitoring to be initiated at nearby environmental monitoring sites (e.g. sites 4, 11, and 114). Additional monitoring for total PCBs (Aroclor Method) at soil and vegetation sites located within 2 km which are not included in the routine program.
	VOC exceeds a level of 3 ppm or THC exceeds 5 ppm	Report individual VOC compounds, compare with appropriate air quality and occupational health and safety guidelines and review trends over the period of record.
Soils	Total PCBs (HRMS Method) increase >50% in the live moss layer at sites in the immediate vicinity of the SHTC where levels may exceed 0.5 ppm.	Collect lower layers (fibric, humic mesic and mineral soil) during the following sampling period and analyze for total PCBs.
Groundwater	Statistically significant increase in key parameters (e.g., PCBs).	Follow-up sampling to verify results and resolve data issues. Implement Response Plan if contaminant levels/trends are verified.
Surface Water/Sediment	Contaminant levels exceed Probable Effect Levels (PEL) in stream sediment samples.	Re-sample in the following year and Initiate additional downstream sampling, if warranted in the following sampling period.
	Contaminant levels exceed PEL in Edith or Chrystina Lake sediments.	Analyze archived white sucker tissue from Chrystina L. for compounds of interest. Re-sample lake sediments in following year to verify results
Fish	Organic contaminant levels in Chrystina Lake brook trout increase by more than 50%.	Analyze archived white sucker tissue for compounds of interest.
	Heavy metal concentrations exceed consumption limits in brook trout from Chrystina Lake.	Analyze archived white sucker tissue for compounds of interest.

Component	Trigger	Response - Additional Monitoring Work
Wildlife	Statistically significant change in June vole population levels correlated with the April/May tissue contaminant levels.	Collect and analyze September vole tissue from plots 4, 11, 114 and 70 for PCBs, dioxins and furans. Expand September population monitoring scope to include all 14 historical population monitoring plots
Toxicology	Vole tissue levels exceed historic high levels; New toxicological information becomes available (i.e. significant change in end-point toxicity of the compounds of interest); or Any new compounds are identified at elevated levels (e.g. heavy metals) in animal tissue.	Conduct toxicological assessment of vole tissue levels.



FEDERATION
OF CANADIAN
MUNICIPALITIES

FÉDÉRATION
CANADIENNE DES
MUNICIPALITÉS

Special Advocacy Fund

24, rue Clarence Street
Ottawa, Ontario K1N 5P3
T. 613-241-5221
F. 613-241-7440

RECEIVED

MAY 17 2018

Taylor, Martin
Town of Barrhead
P.O. Box 4189 5014-50th Avenue
Barrhead, Alberta T7N 1A2
Canada

INVOICE/FACTURE: ORD-18416-K2F9P0

DATE: 05/04/2018

ACCOUNT/COMPTE: 17830

HST # / No. de TVH: 11891 3938 RT0001
QST # / No. de TVQ: 1202728231 TQ 0001

ITEM/DESCRIPTION	RATE/TAUX	TAX/TAXE	TOTAL
Contribution year 1 // année 1	\$150.00	\$7.50	\$157.50
Contribution year 2 // année 2	\$150.00	\$7.50	\$157.50
SUBTOTAL/SOUS-TOTAL:			\$300.00
GST/TPS:			\$15.00
TOTAL:			\$315.00

Learn all about FCM's Special Advocacy Fund and your voluntary contribution:

<http://fcm.ca/advocacyfund>

PAYMENT / PAIEMENT

By cheque payable to / Par chèque à l'ordre de

Federation of Canadian Municipalities

Fédération canadienne des municipalités

By Electronic Funds Transfer/

Par transfert de fonds électronique

Royal Bank of Canada (RBC)

90 Sparks St, Ottawa, ON K1P 5T7

Transit Number/Numéro de transit: 00006

Account Number/Numéro de compte: 1006063

accountsreceivable@fcm.ca

Choose your preferred payment option below / Veuillez choisir votre option de paiement:

Acct# 17830

Payment Amount / Montant Payé

☐ Option 1 - Full payment / Paiement complet

OR / OU

☐ Option 2 - Partial payment / paiement partiel

Due immediately - Year 1 - contribution /
Échéance immédiate - contribution – année 1

Due April 1st, 2019 - Year 2 - contribution /
Échéance le 1er avril 2019 - contribution – année 2



Dear Members

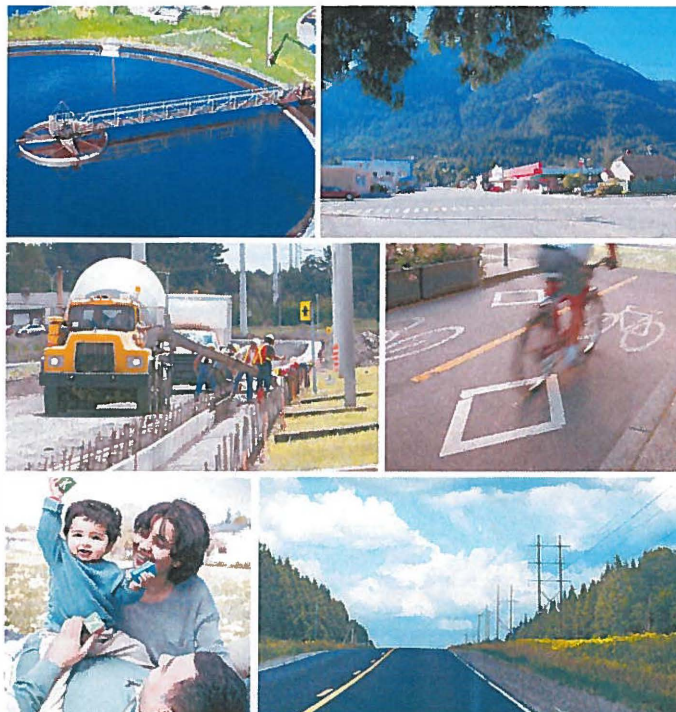
Your FCM Board of Directors is taking steps to propel local governments to new heights through Federal Election 2019, and the crucial months following. This needs to be our biggest effort ever. That's why, in March your Board approved a Special Advocacy Fund to help make that happen.

As you know, FCM has a long track-record of delivering gains for municipalities, like the permanent Gas Tax Fund. Starting with Election 2015, we've shaped game-changing investments in local priorities like never before, and we've achieved new levels of influence for local governments. Now more than ever, all federal parties understand that local solutions tackle national challenges.

Our Election 2015 breakthrough has created new opportunities, and new expectations. To seize this moment — and to build on our historic gains — we need the right tools. We can't risk seeing federal parties move on from local priorities. Election 2019 is our vital opportunity to make municipal progress "the new normal," and to keep our priorities front-and-centre for years to come.

As the order of government closest to daily life, Canadians count on us to build more vibrant and livable communities. This is our moment. Together, we can continue to deliver.

JENNY GERBASI
FCM President



To learn more about
FCM's Special Advocacy Fund, visit
fcm.ca/advocacyfund



Seizing Our Moment, Securing Our Future

FCM's Special Advocacy Fund



FCM delivers for municipalities

Now we need to take the next step

Starting with our Election 2015 breakthrough, FCM's hard work and influence has significantly shaped historic gains for local governments, including:

- ▶ The **Investing in Canada infrastructure plan** — a 12-year, \$180 billion federal investment in local infrastructure, from public transit to wastewater system upgrades.
- ▶ Canada's first-ever **national housing strategy**, including key commitments to repair and build affordable housing across the country.
- ▶ A strengthened **seat at the table**, including through unprecedented engagement with federal, provincial and territorial ministers, as well as with opposition leaders and the Prime Minister.
- ▶ A **predictable federal allocation model** for transit expansions that put municipalities in the driver's seat.
- ▶ A \$2 billion **rural and northern infrastructure fund** — the biggest investment of its kind in a generation.
- ▶ Better access to **high-speed broadband** through the federal Connect to Innovate program and the CRTC decision to mandate universal broadband access.
- ▶ New **capacity-building programs** on asset management and climate change — led by FCM — as well as a new \$125 million capital investment in FCM's Green Municipal Fund.

▶ What is the Special Advocacy Fund?

The last federal election was a turning point that propelled municipal priorities onto the national agenda like never before. The next election is a vital opportunity to build on those gains. To ensure we have the right tools to seize this moment, FCM's Board of Directors has approved a 2-year Special Advocacy Fund. This fund is supported by FCM members using a fee structure similar to how membership fees are determined.

▶ What will the fund be used for?

The Special Advocacy Fund will drive FCM's largest and most ambitious campaign ever, reaching out to every federal party. It means an intensive, multi-faceted strategy that integrates polling, detailed platform development, sustained outreach, and an innovative communications and media plan. It means an extended campaign that keeps municipal priorities front-and-centre heading into Election 2019, as well as in the crucial first months of a new government.

▶ Is the fund mandatory?

The Special Advocacy Fund is voluntary, and not tied to FCM membership. However, it's a vital opportunity for municipalities to take our historic progress to new heights and to continue to deliver for Canadians the same way we always have — together.

"Our choice in the next federal election is simple: either we continue to move forward as local governments, or we fall back. If we get this right, we'll see federal parties competing to support municipal priorities. We'll see a federal government that understands why full partnership with municipalities is the only way forward. Election 2019 is our opportunity to make that happen. We can't leave anything to chance."

Don Iveson
Mayor, Edmonton, AB

"FCM has proven that it can deliver for communities of all sizes. We saw this in the last election, when our work put local issues on the federal map. We've seen it since then through the unprecedented federal investments that FCM has helped secure. Now we need to take this advocacy to the next level, to build our local priorities into the heart of the next government's mandate."

Ray Orb
Reeve, Rural Municipality of Cupar No. 218, SK

To learn more about
FCM's Special Advocacy Fund, visit
fcm.ca/advocacyfund

PROCLAMATION
ALBERTA DEVELOPMENT OFFICERS WEEK
SEPTEMBER 24 TO SEPTEMBER 28, 2018

A Development Officer is a current planning and development specialist with knowledge in current legislation, policy and bylaws, systems and technical requirements for physical development within communities in the Province of Alberta. A Development Officer enforces and administers land use regulations and policies on behalf of a municipality, and is designated to the position of Development Authority by the municipality as defined by the Municipal Government Act, RSA 2000, Chapter M-26.

WHEREAS the Alberta Development Officers Association, representing professional Development Officers in Alberta, endorses Alberta Development Officers Week to recognize sound development and planning practices and the contribution made by Development Officers to the quality of development within our communities and environment; and,

WHEREAS Alberta Development Officers Week helps us to publicly recognize the work of our municipal colleagues in planning and development for the improvement of the _____; and,

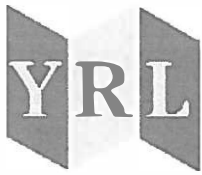
WHEREAS we recognize Development Officers and their commitment to public service; and,

NOW, THEREFORE, I, _____, do hereby proclaim the week of September 24 to September 28, 2018, to be designated as Alberta Development Officers Week in the _____.

Municipality

Proclaimed this _____ day of _____, 2018

Mayor



Yellowhead Regional Library
Board Meeting
Harvey Treleaven Boardroom
433 King Street, Spruce Grove
March 5, 2018

Present

Chair Derril Butler, Lac Ste. Anne County
Vice Chair Hank Smit, Town of Hinton
Bernie Poulin, Summer Village of Silver Sands (Alternate)
Bill Krahn, County of Wetaskiwin No. 10 (Alternate)
David Truckey, Town of Westlock (via teleconference)
Donna Wiltse, Brazeau County
Doug Peel, Town of Millet
Dwayne Mayr, Village of Warburg
Eric Butz, Town of Drayton Valley (Alternate)
Ivor Foster, Town of Thorsby
Jason Wittmeier, Village of Wabamun
Jeff Goebel, Town of Swan Hills
Jenna McGrath, Municipality of Jasper
John Roznicki, Village of Spring Lake
Judy Bennett, Town of Stony Plain
Judy Valiquette, Village of Alberta Beach
Kerry McElroy, Pembina Hills Public Schools
Krystal Baier, Town of Edson
Len Spink, Town of Beaumont
Marlene Walsh, Summer Village of Val Quentin
Pat St. Hilaire, Town of Onoway
Patricia Ashley, Town of Calmar
Patricia MacQuarrie, City of Wetaskiwin
Rick MacPhee, Summer Village of Seba Beach
Rob Staples, Town of Grande Cache
Rod Klumph, Town of Barrhead
Ron Kleinfeldt, County of Barrhead No. 11
Sandi Benford, Summer Village of South View
Sandy Morton, Town of Mayerthorpe
Sylvia Bonnett, Woodlands County
Victor Julyan, Westlock County
Wayne Rothe, City of Spruce Grove

Guests

Ken Allan, Public Library Services Branch
Meghan DeRoo McConnan, Grant Thornton LLP

YRL Staff

Kevin Dodds, Director
Wendy Sears Ilnicki, Assistant Director and
Bibliographic Services Manager
Stephanie Thero, Client Services Manager
David Gould, Accounting and Site Services
Laurie Haak, Administrative Associate and Recorder

Absent

Ann Morrison, Summer Village of Sunset Point
Anne Power, Village of Breton
Brenda Shewaga, Summer Village of Yellowstone
Carla Frybort, City of Leduc
Dave Gursky, Wetaskiwin Regional Public Schools
Ken Lewis, Summer Village of Grandview
Linda Wigton, Northern Gateway Public Schools
Margaret Gagnon, Summer Village of Crystal Springs
Nat Dvernichuk, Village of Clyde
Sandra Cherniawsky, Yellowhead County
Stacey May, Town of Devon
Tammy Svenningsen, YRL Public Libraries' Council
Tanya Pollard, Alberta Library Trustees' Association
Tessa Hutchings, Leduc County
Tom Pickard, Town of Whitecourt
Tracey Melnyk, Parkland County

Representative not Appointed

Summer Village of Birch Cove
Summer Village of Castle Island
Summer Village of Kapasiwin
Summer Village of Lakeview
Summer Village of Ma-Me-O Beach
Summer Village of Nakamun Park
Summer Village of Norris Beach
Summer Village of Ross Haven
Summer Village of Silver Beach
Summer Village of Sunrise Beach
Summer Village of West Cove

CALL TO ORDER

D. Butler called the meeting to order at 10:00 a.m. and introductions were done.

1. Approval of Agenda

K. Dodds corrected some dates on the agenda and in the package.

MOVED by W. Rothe that the agenda be approved as amended. SECONDED by D. Mayr.	CARRIED	3867
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2. Approval of Minutes

MOVED by S. Benford that the minutes of the November 6, 2017 YRL Board meeting be approved as presented.

SECONDED by S. Morton. CARRIED 3868

J. McGrath and M. Walsh entered the meeting.

DECISION ITEMS

3. Draft 2017 Audited Financial Statements – Grant Thornton LLP

M. DeRoo McConnan reviewed the draft 2017 audited financial statements.

MOVED by L. Spink that the Yellowhead Regional Library 2017 Audited Financial Statements be approved as presented. SECONDED by I. Foster.	CARRIED	3869
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M. DeRoo McConnan left the meeting; K. Baier entered the meeting.

4. Inter-fund Transfers

K. Dodds explained that the General Fund is typically returned to a zero balance each year after the audit. Questions arose about this year's amount; K. Dodds explained that there was staffing anomalies last year.

H. Smit noted that the surplus amount was less than 10 per cent of the overall budget and he thanked administration for doing a good job forecasting the budget each year.

MOVED by J. Bennett that the \$319,846 General Fund surplus be transferred to the Operational Contingency Fund. SECONDED by K. McElroy.	CARRIED	3870
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5. 2017 Annual Library System Report to the Province

MOVED by D. Mayr that the Yellowhead Regional Library 2017 Annual Library System Report to the Province be approved for submission to Alberta Municipal Affairs Public Library Services Branch.

SECONDED by S. Benford. CARRIED 3871

6. 2017 Annual Report for Stakeholders

MOVED by S. Bonnett that the Yellowhead Regional Library 2017 Annual Report be approved for distribution to all stakeholders.

SECONDED by P. Ashley. CARRIED 3872

BREAK: 10:40 to 10:50

INFORMATION ITEMS

7. Public Library Services Branch (PLSB) Update – Ken Allan

K. Allan explained that the PLSB regional library consultant assignments were changed recently and he is assigned to YRL now, replacing Ken Feser. He can be reached at 780-641-9363 or ken.allan@gov.ab.ca.

He stated that the Mango Languages contract expires at the end of March and will not be renewed. A new language eResource with a course designer, Pronunciator, will be rolled out in the coming weeks.

K. Allan noted that the PLSB annually hosts a free symposium for library managers and trustees. This year, they partnered with the Alberta Library Trustees' Association (ALTA) and focused on human resources for the two-day *Public Libraries: We're Only Human* symposium. He thanked H. Smit for being a speaker on one of the symposium panels.

8. 2016-2018 Plan of Service Progress Report

K. Dodds provided an overview of the progress/completion of goals and strategies during 2017. He noted that a needs assessment will be conducted this year in preparation for the 2019-2021 Plan of Service.

9. Infrastructure Grant Update

K. Dodds stated that the RFP for the redesign/expansion of the docks, shipping and receiving, and sorting areas had four responses; after review by management, Kemway Builders was selected. He added that the contract has been signed and management will receive renovation proposals soon.

10. Human Resources/Health and Safety Manual Revisions

K. Dodds provided an overview of the revisions that were done to incorporate the Alberta Employment Standards Code changes that took effect January 1, 2018.

11. Trustee Orientation Evaluation Summary

K. Dodds noted that the summary from the January 22 session was in the package and that the 26 trustees and 6 alternates reported they were very satisfied with the session.

12. Alberta Library Conference

K. Dodds explained that nine Executive Committee members are attending the conference; three spots were open to the remaining board trustees and were chosen by lottery draw, as per policy. The conference is April 26-29 at the Fairmont Jasper Park Lodge.

MOVED by L. Spink that the Public Library Services Branch update, 2016-2018 Plan of Service Progress Report, infrastructure grant update, Human Resources/Health and Safety Manual revisions, Trustee Orientation evaluation summary, and Alberta Library Conference update be accepted as presented for information.	
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SECONDED by J. Goebel.	
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CARRIED	
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3873	
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13. Minutes and Reports

a. YRL Board Executive Committee Minutes – December 11, 2017 and February 12, 2018

D. Butler noted that both sets of minutes were in the package.

b. Chair's Report – Derril Butler

D. Butler did not have a report.

c. Director's Report – Kevin Dodds

K. Dodds stated that his report was in the package. He noted that he had done presentations at the Yellowhead Region CAO meeting in Hinton and the Town of Stony Plain council meeting.

d. Assistant Director's Report – Wendy Sears Ilnicki

W. Sears Ilnicki stated that her Bibliographic Services report was in the package. She noted that she will be attending two professional development events:

- Joint Work Site Health and Safety Committee seminar, March 21 in Leduc; and
- Innovative Users Group (IUG) conference with S. Thero, April 23-26 in Orlando FL.

W. Sears Ilnicki added that due the IUG conference, neither she nor S. Thero will be at ALC this year.

e. Client Services Manager's Report – Stephanie Thero

S. Thero stated that her report was in the package. She noted that session proposals are due this week for YRL's conference, *Everyone's Welcome: The Power of Libraries*.

f. YRL Public Libraries' Council (PLC) Chair's Report – Tammy Svenningsen

K. Dodds noted that the PLC Executive Committee meeting highlights were in the package.

g. Alberta Library Trustees' Association (ALTA) Report – Tanya Pollard

K. Dodds noted that the ALTA report was in the package.

MOVED by S. Benford that the YRL Board Executive Committee minutes along with the Chair, Director, Assistant Director, Client Services Manager, YRL Public Libraries' Council, and Alberta Library Trustees' Association reports be accepted as presented for information. SECONDED by M. Walsh.	CARRIED	3874
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14. Correspondence

D. Butler noted that in the package was the letter sent to retired YRL trustees along with the list of retirees, and a letter from Terry Slemko, retired trustee from Northern Gateway Public Schools.

MOVED by R. Kleinfeldt that the correspondence be accepted as presented for information. SECONDED by D. Mayr.	CARRIED	3875
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ADJOURNMENT

MOVED by W. Rothe that the meeting adjourn at 11:35 a.m.	CARRIED	3876
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NEXT MEETING

The next YRL Board meeting is at 10:00 a.m. on Monday, June 11, 2018.

Derril Butler, Chair

Kevin Dodds, Director

Date

Date