City of Hamilton
PUBLIC HEALTH COMMITTEE
AGENDA

Meeting #:	24-004
Date:	April 29, 2024
Time:	9:30 a.m.
Location:	Council Chambers Hamilton City Hall 71 Main Street West

Matt Gauthier, Legislative Coordinator (905) 546-2424 ext. 6437

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1. CEREMONIAL ACTIVITIES

2. APPROVAL OF AGENDA

   (Added Items, if applicable, will be noted with *)

3. DECLARATIONS OF INTEREST

4. APPROVAL OF MINUTES OF PREVIOUS MEETING

   4.1 April 2, 2024

5. COMMUNICATIONS

   5.1 Correspondence from Felicia Radassao, respecting Health Connections Lactation Consultants

   Recommendation: Be received.

   5.2 Correspondence from the Municipality of St. Charles respecting Support for the Resolution Passed by Public Health Sudbury & Districts on January 18, 2024, regarding Household Food Insecurity

   Recommendation: Be received and referred to the Emergency & Community Services Committee.

5.3 Correspondence from Angela Diano, Executive Director, ALPHA-1 Canada, respecting Item 11.1, Resolution to declare the City of Hamilton a “No Paid Plasma Zone”

Recommendation: Be received and referred to the consideration of Item 11.1.

5.4 Correspondence from Haliburton, Kawartha, Pine Ridge District Health Unit respecting Smoke-Free Ontario Amendment Act (Vaping is not for Kids), 2023

Recommendation: Be received.

5.5 Correspondence from Middlesex-London Health Unit respecting Recommendation for Provincial and Federal Restrictions on Nicotine Pouches

Recommendation: Be received.

5.6 Correspondence from Association of Local Public Health Agencies (alPHa) respecting 2023 Chief Medical Officer of Health (CMOH) Annual Report: An All-of-Society Approach to Substance Use and Harms

Recommendation: That the Public Health Committee congratulate Dr. Kieran Moore, Chief Medical Officer of Health (Ontario) and that staff be directed to report back in a series of reports on issues raised in the 2023 CMOH Report as it relates to Hamilton.

5.7 Correspondence from the Honourable Sylvia Jones, Deputy Premier and Minister of Health, respecting Additional Base and One-Time Funding for Public Health Programs

Recommendation: Be received and the Medical Officer of Health, or designate, be authorized and directed to execute all agreements, contracts, extensions, and documents, including submission of budgets and reports required to give effect to the Public Health Additional Base and One-Time Funding for Public Health Programs.”

6. DELEGATION REQUESTS

6.1 Delegation Requests respecting Item 11.1, Resolution to Declare the City of Hamilton a "No Paid Plasma Zone", for today's meeting, from the following individuals:

a. Kat Lanteigne, Executive Director, BloodWatch.org

b. Christine Duncan-Wilson, Immunity Canada

c. Jennifer van Gennip, Network of Rare Blood Disorder Organizations (NRBDO)

d. Anthony Marco, Hamilton and District Labour Council

Members of the public can contact the Clerk’s Office to acquire the documents considered at this meeting, in an alternate format.

6.2 Delegation Requests respecting 10.1, Heat Response Strategy (BOH23010) (City Wide), for today's meeting, from the following individuals:

a. Stewart Klazinga, ACORN Hamilton

7. DELEGATIONS

7.1 Kathleen Zavarise, Trillium Gift of Life, respecting Spreading Awareness about Organ and Tissue Donation (Approved April 2, 2024)

8. STAFF PRESENTATIONS

9. CONSENT ITEMS

9.1 Third-Party Air Monitoring for Green for Life Stoney Creek Landfill (BOH24008) (Wards 5 and 9) (Outstanding Business List Item)

10. DISCUSSION ITEMS

10.1 Heat Response Strategy (BOH24010) (City Wide)

11. MOTIONS

11.1 Resolution to declare the City of Hamilton a “No Paid Plasma Zone”

12. NOTICES OF MOTION

13. GENERAL INFORMATION / OTHER BUSINESS

13.1 Amendments to the Outstanding Business List

a. Items Considered Complete and to be Removed

a. Independent Third Party Air Monitoring at GFL Stoney Creek Landfill

Added: December 4, 2023 (PHC Report 23-012, Item 2(a))

Address as Item 9.1 on today's agenda

14. PRIVATE AND CONFIDENTIAL

15. ADJOURNMENT

Members of the public can contact the Clerk’s Office to acquire the documents considered at this meeting, in an alternate format.

From: Felicia Radassao [redacted]
Sent: Monday, April 15, 2024 3:13 PM
To: Gauthier, Matt <Matt.Gauthier@hamilton.ca>
Subject: Health Connections Lactation Consultants

Good afternoon,

I'm a Hamilton resident from Ward 4 and in January and February benefited from the City's Health Connections Lactation Consultant services. Not only was my first appointment booked quickly, but the Lactation Consultants came to my home which was absolutely incredible. When recovering from childbirth and adapting to living with a newborn, such services are critical for new mothers.

It has come to my attention that this unit had recieved less funding and as a result the number of staff has been reduced. Not only will those laid off staff need to find new jobs, but Hamilton residents who are new mothers may not get the care they need in time. I can tell you from first hand experience that time is of the essence when overcoming breastfeeding challenges. I won't get into why breastfeeding newborns is important, but will emphasize the importance of such services being available at no upfront cost to new mothers! Private lactation consultants are expensive and also have a huge number of clients. It is also extremely difficult to have private consultants come to the home of the new mother, and if they do there's an extra fee. Getting a family doctors referral also takes time as it can take days to secure an appointment. That may sound like "no big deal" but days can mean the difference between overcoming breastfeeding challenges with lactation support, or not.

During a time when our public health care system is constantly being underfunded across the province and the cost of living continues to increase, this news is very disappointing. I hope that the City of Hamilton and the Public Health Committee prioritizes bringing this service back to a robust state that offers timely critical lactation services to all Hamilton mothers who need it. Aggressively lobbying the Provincial Government to release more federal funds slotted for health care is a good start.

Thank you,
Felicia

The Corporation of the Municipality of St. Charles
RESOLUTION PAGE

Regular Meeting of Council

Agenda Number:	8.3.
Resolution Number	2024-071
Title:	Resolution stemming from February 21, 2024 Regular Meeting of Council - Item 10.1 - Correspondence #8
Date:	March 20, 2024

Moved by: Councillor Pothier

Seconded by: Councillor Laframboise

BE IT RESOLVED THAT Council for the Corporation of the Municipality of St.-Charles hereby supports the Resolution passed by Public Health Sudbury & Districts on January 18, 2024, regarding household food insecurity;

AND BE IF FURTHER RESOLVED THAT a copy of this Resolution be sent to Premier Doug Ford; Minister of Children, Community and Social Services, Michael Parsaco; Minister of Finance, Peter Bethlenfalvy; Minister of Municipal Affairs and Housing, Paul Calandra; Deputy Premier and Minister of Health, Sylvia Jones; the Association of Municipalities of Ontario (AMO); our local Member of Provincial Parliament (MPP); and all Ontario Municipalities.

CARRIED

MAYOR

Public Health
Santé publique
SUDBURY & DISTRICTS

January 24, 2024

VIA ELECTRONIC MAIL

The Honourable Doug Ford
Premier of Ontario
Legislative Building, Queen's Park
Toronto, ON M7A 1A1

Dear Recipient:

Re: Household Food Insecurity

At its meeting on January 18, 2024, the Board of Health carried the following resolution #06-24:

> *WHEREAS food security is a chronic and worsening health issue as documented by annual local data on food affordability and as recognized by multiple Association of Local Public Health Agencies (alPHa) resolutions: AO5-18 (Adequate Nutrition for Ontario Works and Ontario Disability Support Program), A18-02 (Minimum Wage that is a Living Wage), A15-04 (Basic Income Guarantee), and A23-05 (Monitoring Food Affordability in Ontario and the Inadequacy of Social Assistance Rates)*
>
> *THEREFORE BE IT RESOLVED THAT the Board of Health for Public Health Sudbury & Districts call on the provincial government to incorporate local food affordability findings in determining adequacy of social assistance rates to reflect the current costs of living and to index Ontario Works rates to inflation going forward; and*
>
> *THAT in the context of the Public Health Strengthening roles and responsibilities deliberations, the Board of Health urge all health system partners to remain committed to population health assessment and surveillance as it relates to monitoring food environments and, specifically, to monitoring food affordability; and share this motion broadly with local and provincial stakeholders.*

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Chapleau
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phsd.ca

Household food insecurity is one of the strongest predictors of poor health, making it a serious public health issue (PROOF, 2023). Individuals who are food insecure are at higher risk of diet-related diseases like diabetes and are at higher risk for a wide range of chronic conditions such as depression and anxiety disorders, arthritis, and chronic pain. Household food insecurity leaves an indelible mark on children's health and well-being (PROOF, 2023). The experience of food insecurity in childhood is associated with mental health concerns throughout childhood and into early adulthood (PROOF, 2023). In Ontario, the healthcare costs of individuals who are the most food insecure can be more than double that of individuals who are food secure (PROOF, 2023, Tarasuk et al., 2015).

Thank you for your attention to this important issue – the solutions for which will not only help many Ontarians in need but also protect the sustainability of our critical health and social services resources.

Sincerely,

Penny Sutcliffe, MD, MHSc, FRCPC
Medical Officer of Health and Chief Executive Officer

cc: Honourable Michael Parsa, Minister of Children, Community and Social Services
Honourable Peter Bthlenfalvy, Ministry of Finance
Honourable Paul Calandra, Minister of Municipal Affairs and Housing
Honourable Sylvia Jones, Deputy Premier and Minister of Health
France Gélinas, Member of Provincial Parliament, Nickel Belt
Jamie West, Member of Provincial Parliament, Sudbury
Michael Mantha, Member of Provincial Parliament, Algoma-Manitoulin
Dr. Kieran Moore, Chief Medical Officer of Health
Jacqueline Edwards and Jennifer Babin-Fenske, Co-chairs, Greater Sudbury Food Policy Council
Richard Lathwell, Local Food Manitoulin
Colleen Hill, Executive Director, Manitoulin Family Resources
All Ontario Boards of Health
Association of Local Public Health Agencies

PROOF (2023). What are the implications of food insecurity for health and health care? Identifying Policy Options to Reduce Household Food Insecurity in Canada. Retrieved from: https://proof.utoronto.ca/food-insecurity/what-are-the-implications-of-food-insecurity-for-health-andhealth-care/

Tarasuk, V., Cheng, J., de Oliveira, C., Dachner, N., Gundersen, C., Kurdyak, P. (2015. Association between household food insecurity and annual healthcare costs. Canadian Medical Association Journal. 1 87 (14) E429-E436. DOI: https://doi.org/10.1503/cmaj.150234

ALPHA-1 CANADA
ALPHA-1 ANTITRYPSIN DEFICIENCY CANADA INC.
LE DÉFICIT EN ALPHA-1 ANTITRYPSINE CANADA INC.

April 17, 2024

Mayor Andrea Horwath
Hamilton City Hall
71 Main Street West
Hamilton, Ontario L8P 4Y5

Dear Mayor Horwath:

I was born and raised in Hamilton, Ontario and I have had a deep commitment to advocating on behalf of vulnerable communities, patients, and caregivers throughout my career. Currently serving as the Executive Director of Alpha-1 Canada and the Board Chair of the Network of Rare Blood Disorders Organizations (NRBDO), I am compelled to express the distress and confusion within patient communities regarding the potential decision to ban the collection of source plasma in Hamilton, as approved by the Ontario Government through a public-private partnership between Canadian Blood Services and Grifols Canada.

Hamilton is home to thousands of patients who depend on life-saving plasma-derived medicines. These critical treatments are manufactured from compensated plasma donations sourced outside of Canada. It is essential to recognize that everyone involved in the supply chain, from manufacturing to distribution and administration, is compensated for their contributions. Not only the countless individuals manufacturing the products, but many Hamiltonians are also compensated for their time and efforts:

- the logistics personnel in Hamilton-Wentworth;
- the distribution centre staff in Hamilton-Wentworth;
- the infusion nurses in Hamilton infusion clinics;
- the blood bank staff in Hamilton hospitals.

Why, then, should the plasma donor not be compensated for their time and effort?

As someone who donates plasma weekly and interacts with donors regularly, I find it offensive to suggest that plasma donation is predatory. The motivations behind each donor's decision are personal, and insinuating that such donations are against “Hamilton's values” undermines the autonomy and informed choices of its residents.

It is important to understand the significant impact of plasma donations on patients' lives. For instance, it takes over 900 plasma donations to treat just one patient with alpha-1 antitrypsin deficiency for a year. 1 in 5,000 Canadians live with alpha-1 antitrypsin deficiency, a genetic disorder, that occurs when there is a lack of a protein in the blood called alpha-1 antitrypsin (AAT). AAT protects the lungs, so without it severely affected patients can have little to no lung protection, which can require lung transplants and cause premature death. A plasma protein replacement therapy is the only specific treatment for severe alpha-1 antitrypsin deficiency.

Provincial and territorial governments have recognized the necessity of supporting public-private partnerships to meet the needs of Canadians living with blood and bleeding disorders.

I respectfully urge you and your Public Health Committee colleagues to listen to the voices of patients and families in Hamilton and consider the extensive research and data, supporting the public-private partnership between Canadian Blood Services and Grifols Canada. This partnership not only aligns with Hamilton's values but also reflects the city's mission and vision.

On behalf of the alpha-1 patient community, I would like to request that you withdraw the notice of motion for the April 29 meeting of the Committee on Public Health to declare the City of Hamilton a “plasma-free zone.”

Sincerely,

Angela Diano
Executive Director

HALIBURTON, KAWARTHA, PINE RIDGE DISTRICT HEALTH UNIT
www.hkpr.on.ca • info@hkpr.on.ca
1-866-888-4577

November 16, 2023

The Honourable Sylvia Jones
Deputy Premier and Minister of Health
Ministry of Health
College Park 5th Floor, 777 Bay Street
Toronto ON M7A 2J3

Sent via email to Sylvia.Jones@pc.ola.org

Dear Minister Jones

RE: Bill 103, *Smoke-Free Ontario Amendment Act (Vaping is not for Kids), 2023*

The Board of Health for the Haliburton, Kawartha, Pine Ridge District Health Unit (HKPRDHU), is writing in support of Simcoe Muskoka District Health Unit's letter dated September 7, 2023, and Public Health Niagara Region's letter dated October 30, 2023 regarding Bill 103, *Smoke-Free Ontario Amendment Act (Vaping is not for Kids), 2023*.

Bill 103's focus on preventing youth uptake of vaping is important to decrease morbidity and mortality and keep Ontarians out of the healthcare system now and in the future. This includes prohibiting the promotion of vapour products, raising the minimum age for purchasing vapour products, and requiring that specialty vape stores obtain store location approval from the local board of health.

Vaping rates among youth in Ontario continue to remain high with 26.4 % of students in grades 7-12 having tried vaping by e-cigarettes in their lifetime. Among those that had vaped in the last year, over 84% report vaping nicotine.

Vaping can impact the developing brain, increase risk of lung injury, and can impact other health issues like lung and cardiovascular disease. High nicotine concentrations, flavours, low cost, easy access, marketing strategies aimed at youth, and the lack of regulatory measures to protect youth are all factors that contribute to youth vaping. Long-term health risks of vaping are still largely unknown.

The proposed requirements of Bill 103 to the *Smoke-Free Ontario Act* would have a positive impact on the health of Ontarians, in particular for youth. Bill 103, if passed, would result in reducing the availability of vape devices and restrict vaping product advertising that has resulted in an increase in nicotine addiction and increasing present and future stress on the healthcare system. The Haliburton, Kawartha, Pine Ridge District Health Unit would be happy to work with your government in supporting the changes proposed within Bill 103 as part of our comprehensive strategy to reduce youth vaping and decrease nicotine addiction.

Yours truly

BOARD OF HEALTH FOR THE HALIBURTON,
KAWARTHA, PINE RIDGE DISTRICT HEALTH UNIT

Original signed by

David Marshall
Chair, Board of Health
Haliburton, Kawartha, Pine Ridge District Health Unit

Encl.

Cc: Honourable Michael Parsa, Minister of Children, Community and Social Services
Honourable Steve Clark, Minister of Municipal Affairs and Housing
Honourable Michael Tibollo, Associate Minister of Mental Health and Addictions
Dr. Kieran Moore, Chief Medical Officer of Health
Honourable David Piccini, MPP, Northumberland-Peterborough South
Laurie Scott, MPP, Haliburton-Kawartha Lakes-Brock
Ontario Boards of Health
Association of Local Public Health Agencies

Office of the Regional Chair | Jim Bradley
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Email: jim.bradley@niagararegion.ca
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October 30, 2023

Sent by e-mail: sylvia.jones@ontario.ca

The Honourable Sylvia Jones
Deputy Premier and Minister of Health
Ministry of Health
College Park 5th Floor, 777 Bay Street
Toronto ON M7A 2J3

Dear Minister Jones,

Re: Bill 103, Smoke-Free Ontario Amendment Act (Vaping is not for Kids), 2023

As Regional Chair for the Regional Municipality of Niagara, I am writing in support of Simcoe Muskoka District's letter on September 7, 2023, (attached) regarding Bill 103, Smoke-Free Ontario Amendment Act (Vaping is not for Kids), 2023. Bill 103 addresses the following:

1. Prohibiting the promotion of vapour products.
2. Amending the legal age to purchase products to 21 years old and above.
3. Prohibiting vapour flavouring and restrict high concentration vapour products.
4. Restricting vapour products to being sold at specialty vape stores or designated stores in remote/rural communities, with approval from the board of health. Selling or offering to sell vapour products online be prohibited.
5. Minister provided the ability to direct tax revenue from vapour product sales at specialty stores to be used for education on the health risks of vaping.
6. Require Ontario Health prepare an annual report to the Ministry on youth vaping with recommendations to the Minister in developing policies.

Vaping rates among youth in Niagara and Ontario continue to remain high with 54% of students in grade nine to 12 reporting trying vaping, and 12% of students in grade seven and eight, which are significantly higher compared to Ontario (38.6%)[1]. Vaping can impact the developing brain, increases risk of lung injury[2] and can impact other health issues like lung

[1] Niagara Region Public Health (2020). 2019 Report on Health Behaviours and Perceptions of Niagara Students. Thorold, ON.
[2] Shmerling, R. Can vaping damage your lungs? What we do and don't know. Harvard Health Publishing- Harvard Medical School. 2023-06-15. [cited 2023-08-18]. Available from: https://www.health.harvard.edu/blog/can-vaping-damage-your-lungs-what-we-do-and-dont-know-2019090417734

disease, asthma and cardiovascular disease[3]. High nicotine concentrations, flavours, low cost, easy access, marketing strategies aimed at youth and the lack of regulatory measures to protect youth are all factors contributing to youth vaping. Long-term health risks of vaping are still largely unknown. Amendments proposed in Bill 103 align with the philosophy of previous positions of Niagara Region Public Health (NRPH), where through consultations and letters to the Province of Ontario and the Federal Government have advocated for stricter legislation to prohibit vaping flavours, limit adjectives and ingredients to describe flavours, regulate advertising/promotion/sponsorship, reduce permitted nicotine concentrations, and increase regulation of online vape sales.

The proposed requirements of Bill 103 to the Smoke-Free Ontario Act would have a positive impact on the health of Ontarians, in particular for youth. Bill 103, if passed, would result in reducing the availability of vape devices and restrict vaping product advertising that has resulted in an increase in nicotine addiction and increasing present and future stress on the healthcare system. NRPH would be happy to work with your government in supporting the changes proposed within Bill 103 as a part of our comprehensive strategy to reduce youth vaping and decrease nicotine addiction.

Yours truly,

Jim Bradley, Chair
Niagara Region

cc: Dr. Kieran Moore, Chief Medical Officer of Health
Honourable Michael Tibollo, Associate Minister of Mental Health and Addictions
Sam Oosterhoff, MPP Niagara West
Jeff Burch, MPP, Niagara Centre
Wayne Gates, MPP, Niagara Falls
Jennifer (Jennie) Stevens, MPP, St. Catharines
All Ontario Boards of Health
Association of Local Public Health Agencies

[3] Chronic e-cigarette use impairs emotional function on the physiological and cellular levels. Arteriosclerosis, Thrombosis, and Vascular Biology. 2022. Nov; 42(11): Available from: Chronic E-Cigarette Use Impairs Endothelial Function on the Physiological and Cellular Levels | Arteriosclerosis, Thrombosis, and Vascular Biology (ahajournals.org)

simcoe muskoka
DISTRICT HEALTH UNIT

September 7, 2023

The Honourable Sylvia Jones
Deputy Premier and Minister of Health
Ministry of Health
College Park 5th Floor, 777 Bay Street
Toronto ON M7A 2J3
sylvia.jones@ontario.ca

Dear Minister Jones:

Re: Bill 103, Smoke-Free Ontario Amendment Act (Vaping is not for Kids), 2023

Electronic cigarettes (e-cigarettes) are addicting youth to nicotine at an alarming rate. Between 2017-2019, vaping rates doubled among Ontario students in grades 7-12. In Simcoe Muskoka, 32% of students in grades 7-12 and 43% of high school students reported using an e-cigarette in the past year. This is particularly concerning when considering the highly addictive effects of nicotine in e-cigarettes is associated with an increased risk for future tobacco cigarette use among youth who vape (Ontario Agency for Health Protection and Promotion, 2018). Further, there are significant health risks associated with youth vaping as a result of the toxic and carcinogenic substances in devices including lung damage, changes to the brain, burns, dependence or addiction, difficulty learning, and increased anxiety and stress.

As chair of the Simcoe Muskoka District Health Unit (SMDHU) Board of Health I am writing in support of Public Health Sudbury and Districts letter on June 28, 2023 regarding Bill 103, Smoke-Free Ontario Amendment Act (Vaping is not for Kids), 2023. Bill 103's focus on preventing youth uptake of vaping is important to decrease morbidity and mortality and keep Ontarians out of the healthcare system now and in the future. This includes prohibiting the promotion of vapour products, raising the minimum age for purchasing vapour products and requiring that specialty vape stores obtain store location approval from the Board of Health.

Such amendments proposed by Bill 103 align with the philosophy of previous positions of the Board of Health, which have been focused on reducing nicotine and tobacco use in our communities. This includes previous Board communications to the Province of Ontario and the Federal Government in support of the previous 2017 Tobacco Endgame for Canada (committing to a target of less than 5% tobacco use in Canada by 2035), supporting previous tobacco tax increases (2018) and a 2014 letter to the Director General, Health Products and Food Branch Inspectorate regarding the increased use and availability of electronic cigarettes.

In 2023, the Board of Health called on the Ontario government to establish a renewed smoking, vaping and nicotine strategy which was supported from the Association of Local Public Health Agencies and the linked letter was sent in August 2023 to the Ontario Minister of Health. Such communications to government have been supported by SMDHU's comprehensive approach to smoke-free programming via education, promotion and

enforcement efforts which are required to manage increasing youth vaping rates through strategies that prevent nicotine addiction such as the Not An Experiment initiative.

The proposed requirements of Bill 103 to the Smoke-Free Ontario Act would have a positive impact on the health of Ontarians, in particular for the youth. Bill 103, if passed, would result in reducing the availability of vape devices and restrict vaping product advertising that has resulted in an increase in nicotine addiction and increasing present and future stress on the healthcare system. SMDHU would be happy to work with your government in supporting the changes proposed within Bill 103 as a part of our comprehensive strategy to reduce youth vaping and decrease nicotine addiction.

Sincerely,

ORIGINAL Signed By:

Ann-Marie Kungl, Board of Health Chair
Simcoe Muskoka District Health Unit

AMK:CG:SR:sh

cc: France Gélinas, Member of Provincial Parliament, Nickel Belt
Dr. Kieran Moore, Chief Medical Officer of Health
Honourable Michael Parsa, Minister of Children, Community and Social Services
Honourable Steve Clark, Minister of Municipal Affairs and Housing
All Ontario Boards of Health
Association of Local Public Health Agencies

BUREAU DE SANTÉ DE MIDDLESEX-LONDON HEALTH UNIT

March 22, 2024

The Honourable Mark Holland
Minister of Health
House of Commons
Ottawa, ON
K1A 0A6

Re: Recommendation for Provincial and Federal Restrictions on Nicotine Pouches

Dear Minister Holland:

The Middlesex-London Health Unit (MLHU), on behalf of Ontario's Southwest Tobacco Control Area Network (SWTCAN), wishes to express our sincere, wholehearted support of Health Canada's recent announcement to address the increasing interest and non-therapeutic use of nicotine-containing products, including nicotine pouches, among youth. This announcement deeply resonates with our shared commitment to safeguard the health and well-being of our communities, and is in line with our support and endorsement of the Windsor-Essex County Board of Health Resolution Report entitled "*Steps Toward Limiting Nicotine Addiction in Youth*", attached as Appendix A. The SWTCAN, comprised of Chatham-Kent Public Health, Grey Bruce Public Health, Huron Perth Public Health, Lambton Public Health, Middlesex-London Health Unit, Southwestern Public Health, and the Windsor-Essex County Health Unit, applauds Health Canada's determined pursuit of regulatory measures to tackle youth appeal, access, and use of nicotine products.

Currently, the administrative decision by Health Canada to approve Zonnic nicotine pouches for sale under the *Natural Health Products Regulations* has meant that flavoured nicotine pouches are now available for purchase in all kinds of retail settings, primarily convenience stores and gas stations, displayed alongside candy, chips, and gum. The pouches come in colourful packaging and in a variety of sweet and fruity flavours, which are particularly appealing to younger consumers. Other brands of nicotine pouches, including "Zyn" and "KlinT" have found their way to the retail shelves in southwestern Ontario. Large video advertisements and branded display units promote the sale of nicotine pouches in the same retail settings where commercial tobacco and vaping products are available for purchase. The spectrum of available nicotine products is growing as the commercial tobacco and vapour product industry capitalize on gaps in the current regulatory framework.

The rapid emergence of nicotine pouches in the market has meant that provincial governments have had insufficient time to establish their own regulatory frameworks to respond to the sale of these products, with the exception of British Columbia and Quebec. On March 20, 2024, Health Canada issued a public advisory to (a) use authorized nicotine pouches only as directed for quitting smoking, and (b) avoid unapproved nicotine pouches in Canada. As Health Canada works to create a regulatory framework, the SWTCAN continues to express its support for the implementation of federal and provincial regulations targeting the retail sale and promotion of flavored nicotine pouches, and other nicotine-containing products that have not yet been proven effective as cessation aids. Specifically:

- that the federal government takes swift action to close the regulatory gap that permits the sale of nicotine pouches and other nicotine-containing products that have not yet been proven effective as cessation aids to individuals under 18 years of age; and,
- that the provincial government consider taking action to embed restrictions on the flavouring, sale, display, and promotion of nicotine pouches and other nicotine-containing products under the *Smoke-free Ontario Act, 2017.*

To provide the necessary time for provincial governments to work with Health Canada to respond to this emerging nicotine delivery device, the SWTCAN further recommends that Health Canada reclassify nicotine pouches as a prescription product or enact a suspension and temporary moratorium on the approval and sale of all nicotine pouches until appropriate regulatory measures are in place.

Nicotine is a highly addictive substance, with substantial evidence documenting the adverse effect of nicotine on the developing brains of youth and young adults. The Middlesex-London Health Unit and the public health units within SWTCAN remain committed to working collaboratively with our school, municipal, provincial, and federal partners to prevent nicotine dependence, to promote cessation, and to protect communities through the promotion and enforcement of health protective policies.

The Middlesex-London Board of Health reviewed further information, which has been attached to this letter (Report No. 16-24 and Appendix A).

Sincerely,

Matthew Newton-Reid	Dr. Alexander Summers MD, MPH, CCFP, FRCPC	Emily Williams BScN, RN, MBA, CHE
Board Chair	Medical Officer of Health	Chief Executive Officer

Cc: Ontario Boards of Health
Hon. Sylvia Jones, Ontario Minister of Health
Arielle Kayabaga, Member of Parliament, London West
Karen Vecchio, Member of Parliament, Elgin-Middlesex-London
Lianne Rood, Member of Parliament, Lambton-Kent-Middlesex
Lindsay Mathyssen, Member of Parliament, London-Fanshawe
Peter Fragiskatos, Member of Parliament, London North Centre
Teresa Armstrong, Member of Provincial Parliament, London-Fanshawe
Hon. Rob Flack, Member of Provincial Parliament, Elgin-Middlesex-London
Terence Kernaghan, Member of Provincial Parliament, London North Centre
Peggy Sattler, Member of Provincial Parliament, London West

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BUREAU DE SANTÉ DE MIDDLESEX-LONDON HEALTH UNIT
www.healthunit.com

MIDDLESEX-LONDON BOARD OF HEALTH

REPORT NO. 16-24

TO: Chair and Members of the Board of Health

FROM: Dr. Alexander Summers, Medical Officer of Health
Emily Williams, Chief Executive Officer

DATE: 2024 March 21

RECOMMENDATION FOR PROVINCIAL AND FEDERAL RESTRICTIONS ON NICOTINE POUCHES

Recommendation

It is recommended that the Board of Health:

1) *Receive Report No. 16-24 re: "Recommendation for Provincial and Federal Restrictions on Nicotine Pouches" for information;*
2) *Endorse the Windsor-Essex County Board of Health Resolution Report, attached as Appendix A; and*
3) *Direct staff to submit a letter to Health Canada on behalf of the seven public health units in southwestern Ontario, attached as Appendix B.*

Report Highlights

- Health Canada authorized nicotine pouches containing 4 mg of nicotine under the *Natural Health Products Regulations,* raising concerns nationwide due to their accessibility, marketing, and appeal to youth.
- The Windsor-Essex County Board of Health Resolution Report, attached as Appendix A, calls for swift federal action to curb sales to those under 18 years of age and calls for provincial restrictions on the flavoring, sale, display, and promotion of nicotine pouches under the *Smoke-Free Ontario Act, 2017.*
- Health Unit staff prepared a letter for submission to Health Canada on behalf of the seven public health units in southwestern Ontario, attached as Appendix B, endorsing the Windsor-Essex County Board of Health Resolution Report.

Current Landscape of Nicotine Products in Canada

Nicotine pouches made by Imperial Tobacco Canada Ltd. were officially authorized for sale by Health Canada as a natural health product on July 18, 2023, under the *Natural Health Products Regulations* as nicotine replacement therapy and a smoking cessation aid. Each package contains 10 or 24 pouches, and each pouch contains up to 4 milligrams of nicotine. The amount of nicotine in a cigarette can vary, depending upon the brand (11.9 to 14.5 mg of nicotine); however, those who smoke will only absorb 1 to 1.5 mg of nicotine from a single stick. This means that one pouch may contain nicotine that is the equivalent of up to 4 cigarettes.

The classification of nicotine pouches as a natural health product allowed the pouches to fall beyond the scope of the federal *Tobacco and Vaping Products Act (TVPA*) and the provincial *Smoke-Free Ontario Act (SFOA), 2017*, which regulate the marketing, retail sale and display, and public use of commercial tobacco and vaping products. Presently, in Ontario, nicotine pouches are available for purchase at convenience stores and gas stations, displayed alongside candy, chips, and gum. The pouches come in colourful packaging and in a variety of sweet and fruity flavours, which are particularly appealing to younger consumers. Large video advertisements and branded display units promote the pouches as a quitting aid, while the producers of these products continue to manufacture and market commercial tobacco and vaping products. The spectrum of available nicotine products is growing as the tobacco industry capitalizes on gaps in the current regulatory framework.

Reaction and Regulatory Approaches Across Canada

Due to nicotine's highly addictive nature and its adverse effects on the developing brains of youth and young adults, the approval by Health Canada sparked significant concern among health organizations across Canada. The advertising of nicotine pouches is governed federally; however, where these products can be sold, including age and advertising restrictions at retail, rest with provinces and territories. Youth-friendly advertising, substantial marketing and distribution strategies, and flavoured nicotine products that lack age restriction regulations are a local public health concern. Retailers are reporting that they are challenged to keep the different brands of nicotine pouches and gum produced by the tobacco industry in stock across Middlesex-London, and packaging is being littered in schools and in parks.

Until recently, Québec was the sole Canadian province with a regulatory framework limiting the sale of nicotine replacement therapy products, including nicotine pouches to pharmacies. However, on February 7, 2024, British Columbia enacted regulation to restrict the sale of nicotine pouches to behind the counter at pharmacies, requiring consultation with a pharmacist prior to purchase. At the time of drafting this report, no additional measures have been taken by other provinces.

Next Steps

In January 2024, the Windsor-Essex County Board of Health passed a resolution report, attached as Appendix A, calling for immediate federal and provincial regulatory action. The Resolution Report calls on the federal government to take swift action to address the regulatory gap allowing nicotine pouch sale to individuals under 18 years of age. Furthermore, the resolution calls on the provincial government to regulate the retail sale of nicotine pouches under the *Smoke-free Ontario Act, 2017.* An endorsement letter was prepared by Health unit staff on behalf of the Southwest Tobacco Control Area Network (i.e., the seven public health units in southwestern Ontario), attached as Appendix B. With Board of Health direction, the letter would be submitted to Health Canada and copied to the Ontario Ministry of Health.

This report was prepared by the Social Marketing and Health System Partnerships Team.

Alexander Summers, MD, MPH, CCFP, FRCPC
Medical Officer of Health

Emily Williams, BScN, RN, MBA, CHE
Chief Executive Officer

This report refers to the following principle(s) set out in Policy G-490, Appendix A:

- The Substance Use and Injury Prevention Standard (requirements 2 and 3) as outlined in the *Ontario Public Health Standards*
- The *Tobacco and Vaping Products Act*
- The *Smoke-free Ontario Act, 2017*
- The following goal or direction from the Middlesex-London Health Unit's Strategic Plan:
    - Our public health programs are effective, grounded in evidence and equity.

This topic has been reviewed to be in alignment with goals under the Middlesex-London Health Unit's Anti-Black Racism Plan and Taking Action for Reconciliation: An Organizational Plan, specifically ensuring the use of culturally appropriate language.

Windsor-Essex County Health Unit Board of Health

RECOMMENDATION/RESOLUTION REPORT

Steps toward Limiting Nicotine Addiction in Youth;

Local, Provincial, and Federal Restrictions on Nicotine Pouches

Date: Thursday, January 18th, 2024

ISSUE/PURPOSE

The recent availability of Nicotine Pouches under the brand name "Zonnic" has triggered widespread concern from health organizations across Canada, including the Canadian Cancer Society, Heart and Stroke, and the Canadian Lung Association, who have issued calls for immediate federal action to regulate their sale to youth (von Stackelberg, 2023). Health Canada has approved the products under their *Natural Health Products* designation as a Nicotine Replacement Therapy (NRT) which can be used to quit smoking. Each package contains either 10 or 24 pouches with each pouch contains up to 4mg of nicotine, the equivalent of up to 2 cigarettes (Marsh, 2023).

Nicotine is highly addictive and has permanent adverse effects on the developing brains of youth and concerns regarding the nicotine pouches are rooted in their marketing and distribution approach being attractive to young people. An approach which includes attractive colours and targeted promotions, fruity flavouring which includes sweeteners, and a lack of regulations which makes it legal for children and youth to purchase these products. The similarities in purpose, advertising, and the range of flavors offered by nicotine pouches relative to the already popular vaping products poses a significant risk of sparking a trend comparable to rapid uptake of vaping amongst youth.

BACKGROUND

Nicotine pouches were approved for sale in Canada on July 18, 2023 as a *Natural Health Product*. The nicotine pouches are currently outside the scope of the federal *Tobacco and Vaping Products Act* (TVPA) and the provincial *Smoke-free Ontario Act (SFOA) 2017* which regulate tobacco and vaping products by restricting their advertisement, display, and public use. As a result, the nicotine pouches are currently being sold at convenience stores and gas stations, placed alongside items such as candy and chips. The pouches are sold in vibrant packaging and various sweet and fruity flavours which are attractive to younger populations.

The recent growth in popularity of vaping products serves as an example of the importance of moving quickly to mitigate the risk of these new products (University of Waterloo & Brock University, 2023). Although research on the health effects of using nicotine pouches is still emerging, the effects of using oral NRTs include mouth ulcers, mouth and throat soreness, and coughing (M. Jackson et al., 2023). For youth and young adults who develop a dependence on nicotine, lasting negative impacts on the cognitive abilities, growth, and development can also occur (Stein et al., 1998; Ren & Lotfipour, 2019). Most concerningly, given the highly addictive nature of nicotine, dependence can lead to further use of vaping product, tobacco products, or other drugs (Leslie, 2020).

The Windsor-Essex County Health Unit (WECHU) has consistently engaged businesses, school administrators, students, parents, and municipalities to inform these groups about the health consequences of tobacco and vaping

and has worked closely with them to develop policies, and enforce provincial regulations pertaining to smoking and vaping in public areas. The WECHU is committed to working closely with these same partners to better understand the best ways to keep residents, in particular young people, safe from these products however, until such time that a regulatory framework is established at the federal and provincial levels it is possible that the uptake of these products in Windsor and Essex County will escalate in a similar manner to vaping products.

PROPOSED MOTION

Whereas, Health Canada has approved Nicotine Pouches for sale under a *Natural Health Product* designation which does not provide restrictions on advertising or sale to minors; and

Whereas, there is no evidence to demonstrate the efficacy of Nicotine pouches as a smoking cessation aid; and

Whereas, the emergence of nicotine pouch products produced by Imperial Tobacco Canada, under the brand name "Zonnic" has occurred rapidly without the same regulations applied to other nicotine products; and

Whereas, the marketing and accessibility of Zonnic Pouches raises concerns regarding its appeal to youth populations; and

Whereas, the Nicotine Pouches fall outside existing provincial regulations on tobacco and vaping products; and

Whereas, there are significant concerns regarding the risks to youth and young adults who do not smoke and parallels between nicotine pouch use and vaping.

Now therefore be it resolved that the Windsor-Essex County Board of Health strongly encourages the federal government to take immediate action to close the regulatory gap that permits the sale of nicotine pouches to people under the age of 18; and

FURTHER THAT, the Windsor-Essex County Board of Health strongly encourages the province of Ontario to take immediate action to embed restrictions on the flavouring, sale, display, and promotion of nicotine pouches under the provincial *Smoke-free Ontario Act, 2017;* and

FURTHER THAT, the Windsor-Essex County Health Unit works closely with local municipalities to review tobacco/vape-free public place bylaws to include additional nicotine products; and

FURTHER THAT, the Windsor-Essex County Health Unit works closely with local schools and boards to update policies to ensure products like nicotine pouches, and other emerging products that are tobacco or nicotine related are prohibited on school property.

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alPHa
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Hon. Sylvia Jones
Minister of Health
College Park 5th Flr, 777 Bay St
Toronto, ON M7A 2J3

April 5, 2024

Dear Minister Jones,

Re: 2023 Chief Medical Officer of Health (CMOH) Annual Report: An All-of-Society Approach to Substance Use and Harms

On behalf of the Association of Local Public Health Agencies (alPHa) and its Boards of Health Section, Council of Ontario Medical Officers of Health Section, and Affiliate Associations, we are writing in response to the Chief Medical Officer of Health's 2023 Annual Report, which addresses substance use and harms and recommends strategies to reduce them.

Public Health has an important mandate in several areas of the Ontario Public Health Standards to reduce harms related to substance use, including activities in chronic disease prevention, injury prevention, social determinants of health and substance abuse prevention and harm reduction. Comprehensive strategies to address the potential harms of substance use can only succeed through a multisectoral combination of interventions: education, early prevention, harm reduction, treatment, and regulation. The CMOH's report strongly supports this approach and suggests specific and evidence-informed policy measures in each of these areas to reduce the rising public health toll of substance use in Ontario.

We are very pleased that Dr. Moore has chosen this as the theme of this year's report, as our members have a long history of highlighting the significant impact of substance use on Ontarians and its burden on public services such as health care and law enforcement. With alPHa as their collective voice, they have endorsed a number of resolutions that are directly connected to the themes of this report. A selection of these is attached, and their connections to the CMOH's observations and recommendations are outlined below.

Resolution A23-02: Toward a Renewed Smoking, Vaping, and Nicotine Strategy in Ontario

This resolution touches upon the ongoing burden of tobacco, with references to the rising prevalence of vaping and cannabis use. It urges the Minister of Health to develop a renewed and comprehensive smoking, vaping, and nicotine strategy, with the support of a multidisciplinary panel of experts, local public health, and people with lived experience. The CMOH outlines the elements of a recommended strategy beginning on page 48.

Resolution A11-1: Conduct a Formal Review and Impact Analysis of the Health and Economic Effects of Alcohol in Ontario and Thereafter Develop a Provincial Alcohol Strategy

This resolution outlines the significant direct and indirect health and economic impacts of alcohol use and asks the Ontario government to conduct a formal review and impact analysis of the health and economic effects of alcohol in Ontario and develop a provincial Alcohol Strategy. The CMOH outlines the elements of a recommended strategy beginning on page 58.

Resolution A22-4: Priorities for Provincial Action on the Drug/Opioid Poisoning Crisis in Ontario.

This resolution outlines the alarming morbidity, mortality, and societal impacts of the ever-worsening drug toxicity crisis in this province. It calls for a collaborative, well-resourced and comprehensive multi-sectoral approach based on nine priorities identified in the appendix. The CMOH outlines elements of a recommended strategy on page 62.

Resolution A19-3: Public Health Approach to Drug Policy

This resolution, which is cited in the CMOH's report among similar positions that support his own recommendation, calls for the decriminalization of the possession of all drugs for personal use, and scaling up prevention, harm reduction and treatment services. These positions support the CMOH's observation that "arresting, charging, and incarcerating people who use drugs have failed as a strategy to reduce harmful opioid use" (p. 61).

Resolution A19-8, Promoting Resilience through Early Childhood Development Programming

This resolution is aligned with the CMOH's observations about the upstream interventions that need to be considered to reduce the risk factors that lead to substance abuse and addictions later in life. These interventions "focus on building stronger families and stronger, more connected communities, addressing systemic and structural determinants of health, and improving health equity". Our resolution calls on the province to support investments in early childhood development to enable health and resiliency throughout life, promote mental health and reduce mental illness and addictions. It also repeats our ongoing call to adequately fund the Healthy Babies Healthy Children program, which is cited in the CMOH report as an existing public health program that would effectively address some of the early drivers of substance use and addictions with proper investment (p. 31).

Resolution A22-5: Indigenous Harm Reduction: A Wellness Journey

This resolution outlines the burden of harm associated with substance use among Indigenous peoples, and calls for the adoption of policies, practices and programs for harm reduction that are culturally safe and rooted in community-knowledge and needs, as well as additional funding to support Indigenous harm reduction interventions. The CMOH similarly outlines the disproportionate impacts of substances and addictions on Indigenous peoples (p. 25) and recommends decolonizing practices and interventions in favour of Indigenous-centred approaches (p. 33).

We recognize that addressing substance use and its harms is multifaceted and complex and appreciate the CMOH's acknowledgement that it is indeed a "balancing act", where there may be tension among a range of valid interests as interventions are considered. This report recognizes the challenges and is deliberate about including the many societal factors and multiplicity of influential policy drivers that should be considered as part of constructive discussion of a strategic approach.

alPHa would like to thank the Chief Medical Officer of Health Dr. Kieran Moore and his staff for their leadership on key evidence-based strategies to prevent and reduce the harms related to tobacco, alcohol, cannabis, and opioids. As he has clearly stated, this is an all-of-society, health-first issue, and the public health sector plays an important role, but we are just one player. We look forward to playing our part in a comprehensive approach to advancing the aims of this important report through our already mandated efforts and related advocacy.

We look forward to working with you and welcome any questions you may have. Please have your staff contact Loretta Ryan, Executive Director, alPHa, at loretta@alphaweb.org or 647-325-9594.

Sincerely,

Dr. Charles Gardner,
President

Copy: Hon. Doug Ford, Premier of Ontario
Deborah Richardson, Deputy Minister of Health
Dr. Kieran Moore, Chief Medical Officer of Health, Ontario
Elizabeth Walker, Executive Lead, Office of the Chief Medical Officer of Health

Encl.

The Association of Local Public Health Agencies (alPHa) is a not-for-profit organization that provides leadership to Ontario's boards of health. alPHa represents all of Ontario's 34 boards of health, medical officers and associate medical officers of health, and senior public health managers in each of the public health disciplines – nursing, inspections, nutrition, dentistry, health promotion, epidemiology, and business administration. As public health leaders, alPHa advises and lends expertise to members on the governance, administration, and management of health units. The Association also collaborates with governments and other health organizations, advocating for a strong, effective, and efficient public health system in the province. Through policy analysis, discussion, collaboration, and advocacy, alPHa's members and staff act to promote public health policies that form a strong foundation for the improvement of health promotion and protection, disease prevention and surveillance services in all of Ontario's communities.

RESOLUTION A23-02

TITLE: **Toward a Renewed Smoking, Vaping, and Nicotine Strategy in Ontario**

SPONSOR: **Simcoe Muskoka District Health Unit (SMDHU)**

WHEREAS commercial tobacco use remains the leading preventable cause of death and disease in Ontario and Canada; and

WHEREAS the direct and indirect financial costs of tobacco smoking are substantial and were estimated at $7 billion in Cancer Care Ontario and Public Health Ontario's 2019 report The Burden of Chronic Diseases in Ontario; and

WHEREAS the prevalence of cigarette smoking among Ontarians aged 15 years and older in 2020 was 9.9%, amounting to 1,222,000 people; and

WHEREAS the commercial tobacco control landscape has become more complex with the rapid rise of vaping among youth, as well as the concerning prevalence of waterpipe and cannabis smoking; and

WHEREAS the membership previously carried resolution A21-1 proposing policy measures to address youth vaping for implementation at the provincial and federal levels, several of which have yet to be implemented; and

WHEREAS the membership previously carried resolution A17-5 recommending that the provincial tobacco control strategy be aligned with the tobacco endgame in Canada; and

WHEREAS Ontario and Canada have made great strides in commercial tobacco control in Ontario, which are now endangered by the lack of a provincial strategy and infrastructure to support its continuation; and

WHEREAS disproportionate commercial tobacco and nicotine use and associated health burdens exist among certain priority populations;

NOW THEREFORE BE IT RESOLVED that the Association of Local Public Health Agencies write to the Ontario Minister of Health recommending that a renewed and comprehensive smoking, vaping, and nicotine strategy be developed with the support of a multidisciplinary panel of experts, local public health, and people with lived experience;

AND FURTHER that the Association of Local Public Health Agencies recommend that, in the development of a target for such a provincial strategy, the expert panel examine the sufficiency and inclusiveness of Canada's Tobacco Strategy target of less than 5% commercial tobacco use by 2035 with respect to all nicotine delivery products;

AND FURTHER that the Association of Local Public Health Agencies recommend that the pursuit of health equity be foundational to such a provincial strategy;

AND FURTHER that a copy be sent to the Chief Medical Officer of Health of Ontario.

BACKGROUND:
TOWARD A RENEWED COMMERCIAL TOBACCO AND NICOTINE STRATEGY IN ONTARIO

1. Commercial Tobacco

Canada has made great strides in commercial tobacco[1] control, and Ontario has until recent years been a leader among our provinces and territories, having made tremendous progress in decreasing smoking rates and in turn the negative health outcomes of smoking. Smoking prevalence among Canadians and Ontarians 15 years and older have dropped from 25% and 23%, respectively, in 1999 down to around 10% in 2020.[1] This decrease is representative of a remarkable downward trend nationally and provincially that appear to be on track to reach the endgame goal of less than 5% tobacco use by 2035, a target adopted by the federal government in Canada's Tobacco Strategy[2] and previously recommended for adoption in Ontario[3]. The recent Report of the First Legislative Review of the *Tobacco and Vaping Products Act* elaborates on this trend, noting that "declines in the number of young persons who smoke played an important role in declining prevalence rates overall; smoking rates among Canadians aged 15-19 are currently at an all-time low."[4]

However, it is crucial to note that this progress was achieved over decades, with explicit commercial tobacco control strategies in place to guide tobacco control research, policy development, and policy implementation; all this work was also undergirded by a robust infrastructure. Recent examples of progress in the federal policy arena include the implementation of policies around plain and standardized packaging for commercial tobacco products and enhanced package health warnings, as well as a ban on flavours in cigarettes and most cigars. Provincially, Ontario has strengthened its commercial tobacco contraband measures.

While Canada retains a strategy, Ontario is now operating without one—and there is still much work to be done: Tobacco use remains the leading preventable cause of death and disability in Canada,[5,6] killing approximately 48,000 Canadians each year,[2] of which nearly 17,000 are Ontarians.[7] The Ontario Public Health Standards' *Tobacco, Vapour and Smoke Guideline, 2021* states that "[e]very day tobacco kills more Ontarians than alcohol, illegal drugs, accidents, suicides and homicides combined. People who use tobacco are more likely to go to the hospital and stay longer. They are also likely to die younger."[8] The economic burden is similarly immense: While updated data on the economic burden of tobacco use is needed, 2017 data indicated health care costs of $6.1 billion and overall costs of $12.3 billion nationally.[9] In Ontario, a separate report determined the overall annual economic burden of tobacco smoking to be around $7 billion, exceeding that of alcohol consumption, physical inactivity, or unhealthy eating, taken separately.[10]

2. Vaping

The landscape of commercial tobacco and nicotine products has become more complex with the advent of vaping products containing nicotine, which includes electronic cigarettes (e-cigarettes), the primary users of which are youth. Vaping is the "act of inhaling and exhaling an aerosol produced by a vaping product, such as an electronic cigarette."[11] Most vaping devices use electrical power from a battery to heat a liquid solution to produce an aerosol that is breathed in by the user through the mouthpiece. Most vaping liquids contain nicotine, the levels of which range from very low to more than what is found in a typical tobacco cigarette, together with flavouring compounds that are dissolved in a liquid mixture

[1] Commercial tobacco is distinct from traditional or ceremonial use of tobacco by Indigenous peoples. In the implementation and enforcement of the *Smoke-Free Ontario Act, 2017*, the Ministry of Health protects the use of tobacco by Indigenous peoples and communities when used for traditional or ceremonial purposes.

composed typically of propylene glycol and/or glycerol (i.e., vegetable glycerin).[11] Some vaping liquids also contain cannabis.[12]

National data from 2021 indicates that 13% of adolescents aged 15 to 19 years and 17% of young adults aged 20 to 24 years in Canada reported having vaped at least once during the 30-day period before the survey, compared with 4% of adults aged 25 or older.[13] Provincially, there has been a meteoric rise in youth vaping rates in recent years: According to the Ontario Student Drug and Health Survey, grade 7–12 students who reported used vaping products in the past year doubled from 11% in 2017 to 23% in 2019, with 13%—representing approximately 105,600 students—vaping weekly or daily.[14] These rates are particularly alarming among students in higher grades: The 2019 survey indicated that 35% of students in grade 12 vaped in the past year, of which 21% were vaping weekly or daily.[14] Moreover, among students who vaped in the past year, those who reported using a nicotine-containing product doubled from 28% in 2017 to 56% in 2019.[14] The more recent 2021 survey noted a decrease of past-year vaping among students to 15%. However, those who reported using a nicotine-containing product increased further to 84%, implying that the overall percentage of students vaping nicotine-containing products remained approximately the same as in 2019. There are several challenges to interpretation of the 2021 survey results. For example, the change to an online mode of questionnaire delivery for 2021 led to dramatically decreased response rates that may impact the provincial representativeness of the results.[15] The report also indicates that "because of the significant changes to the methodology in 2021, caution is warranted when comparing these estimates with those from previous OSDUHS cycles."[15] More broadly, both the COVID-19 pandemic as well as changes to the federal and provincial regulatory and policy environments since 2019 have likely impacted the prevalence of youth vaping; however, longitudinal assessments have been disrupted by the pandemic and therefore the extent of impacts is unknown. Further monitoring, data collection and evaluation is needed to understand the impact of these changes and events on adolescent vaping initiation, escalation, and overall prevalence.

Regardless of the method of delivery, the highly addictive effects of nicotine are fundamentally the same, and may have particularly insidious effects on the developing brains of youth.[16,17] Although vaping products have been advertised in part as a harm reduction and smoking cessation product that may reduce health risks and possibly save lives for people who smoke, with some evidence to support this claim,[18,19] there has been no discernible population-level change in smoking cessation rates since vaping products entered the market.[20] Therefore, any individual-level efficacy of vaping products as a smoking cessation tool does not appear to translate to population-level impact. Furthermore, the vast majority of uptake has been among youth without a smoking history. In fact, among those who reported having vaped in the past 30 days, a majority (61%) of youth aged 15 to 19 and more than one-quarter (27%) of young adults aged 20 to 24 had never tried a tobacco cigarette in their life, which suggests that the majority of youth are not using vaping devices to reduce or quit smoking.[13] Therefore, the current evidence around the benefits of vaping products for the purpose of smoking cessation, while still evolving, is not of relevance to youth. In contrast, the evidence to date around the harms of vaping is becoming increasingly clear; in particular, people who vape but do not smoke are on average around three times more likely than those who do not vape to initiate cigarette smoking,[21,22] lending credence to the concern of a gateway effect. Additional evidence of harms from vaping includes the following:

- A variety of substances known to be toxic, carcinogenic, or cause disease have been identified in vaping products.[23]
- Intentional or accidental exposure to nicotine e-liquids can lead to poisoning, which can be lethal, with a significant number of accidental poisonings occurring in children under the age of six.[21]
- Vaping can cause burns and injuries, which can be lethal.[21]
- Vaping can cause respiratory disease in the form of E-cigarette or Vaping Use-Associated Lung Injury (EVALI).[21]
- Vaping can lead to seizures.[21]

- Vaping products contribute to environmental waste.[21]

Moreover, there are differences between vaping and smoking dependence that may impact attempts to quit, including the greater variability in vaping products compared to cigarettes, the discreteness and convenience of vaping, and the greater social acceptability of vaping among youth.[24] To address the rise of vaping, Ontario has required retail registration with local public health units for sale of flavoured vaping products (except mint-menthol or tobacco flavours), restricted sale of flavoured products (except mint-menthol and tobacco flavours) to specialty vape stores, banned sale of vaping products in several public premises, and banned their use in most public premises, though with notable exceptions such as post-secondary institutions. There are also several promising local and regional campaigns such as "Not an Experiment"[25] aiming to raise awareness among youth, parents, and educators about the risks of vaping. However, more control measures and interventions, as well as evaluation of their effectiveness, are needed to protect youth from the harms of both vaping as well as all future commercial nicotine delivery products.

3. Waterpipe smoking

Also referred to as "shisha" or "hookah", waterpipe smoking involves smoking a heated tobacco or non-tobacco "herbal" product.[26] Its increase in prevalence globally may be explained in part by misconceptions of lesser harm relative to other forms of tobacco smoking, its social nature, and the availability of various flavours and nicotine-free products.[26] However, waterpipe smoking of both tobacco and non-tobacco products results in inhalation of various carcinogens and toxins, and results in similar negative health effects to cigarette smoking.[26] Moreover, while the *Smoke-Free Ontario Act, 2017* prohibits the use of tobacco in waterpipes in restaurants and bar patios, the use of non-tobacco products in waterpipes is still permitted, impacting not only waterpipe smokers but also the public through secondhand and thirdhand smoke.[26]

4. Cannabis smoking

Cannabis, which can be consumed by various means including smoking, vaping, and ingestion, refers to all products derived from the *Cannabis sativa* plant, and can consist of up to approximately 540 different chemical substances, among which the main psychoactive constituent is tetrahydrocannabinol (THC).[27] The federal *Cannabis Act* came into force in October 2018, resulting in legalization and regulation of production, distribution, sale, import, export, and possession of cannabis for adults of legal age.[28] The 2021 Canadian Cannabis Survey indicates that approximately 25% of Canadians have reported using cannabis in the past 12 months, of whom 74% reported smoking as one method of cannabis consumption.[12] In addition to an array of health effects associated with cannabis consumption, smoked cannabis in particular can increase risk of bronchitis, lung infections, and chronic cough.[29] The *Smoke-Free Ontario Act, 2017* prohibits the smoking of cannabis in enclosed workplaces, enclosed public places, and other designated places.

5. Ontario's commercial tobacco and nicotine control landscape

Despite concerted efforts through research and reports providing evidence-informed recommendations towards a "tobacco endgame" culminating in the *Smoke-Free Ontario Modernization* report in 2017,[3] there has been limited incorporation of these recommendations into the province's approach to commercial tobacco and nicotine control.[30] For example, actions to increase the cost of commercial tobacco products through tax and other pricing policies have been limited; Ontario continues to have the second lowest retail price and total tobacco tax for tobacco products in Canada.[31,32] Moreover, among the many programs and services that have been lost during the COVID-19 pandemic, commercial tobacco and nicotine prevention, protection, and cessation programs have been significantly impacted. Indeed, the

broader commercial tobacco control infrastructure in Ontario has declined substantially both before and during the pandemic, a decline that is closely tied to the loss of a provincial strategy. With the loss of the Smoke-Free Ontario Strategy, the following crucial infrastructure has been lost: the Smoking and Health Action Foundation, the Leave the Pack Behind program, the Youth Advocacy Training Institute as well as the associated youth advocacy programming, the Program Training and Consultation Centre, funding to public health units for youth and young adults as staff, Smokers' Helpline telephone counselling, Registered Nurses Association of Ontario special projects for tobacco control, Heart & Stroke Foundation of Ontario mass media campaigns, and provincial mass media campaigns. In addition, provincial funding has been reduced for monitoring, research, and evaluation, which has impacted the activities of organizations such as the Ontario Tobacco Research Unit. Funding from other sources such as NGOs has also been lost for organizations such as the Ontario Campaign for Action on Tobacco. Furthermore, many stakeholder engagement opportunities at the provincial level, such as through the Tobacco Control System Committee, the Youth Prevention Task Force, the Communications and Marketing Advisory Committee, the Protection and Enforcement Task Force, the Research and Evaluation Task Force, the Capacity Building and Training Task Force, and monthly calls between Tobacco Control Area Networks and Ministry staff, have been discontinued. Finally, organizations such as Public Health Ontario have had a reduced focus on commercial tobacco and nicotine as an inevitable consequence of the significant resources that have been committed to combatting the COVID-19 pandemic, although their recent re-engagement in this area is inspiring.

These setbacks are compounded by ongoing inequities in the health impacts of tobacco and nicotine use among certain populations. Smoking is a socioeconomically stratified behaviour, as evidenced by decreasing prevalence rates with increasing education.[33] Disproportionate commercial tobacco and nicotine use and associated health burdens exist among Indigenous populations, members of the LGBTQ2S+ community, low-income populations, people with less formal education, people working in certain occupations (e.g., trades), individuals with mental health needs, individuals who use other substances, and incarcerated individuals.[2,9,31,34] Moreover, while reaching less than 5% tobacco use by 2035 may be possible with current strategies, such a target on its own does not sufficiently address this disproportionate burden among these populations. When addressing such health inequities among Indigenous peoples, it is also important to take a culturally safe approach that distinguishes between commercial tobacco use and traditional or ceremonial use of tobacco.

6. Examining the policy options

In late 2022, the Simcoe Muskoka District Health Unit (SMDHU) performed a brief jurisdictional scan focusing on recently implemented commercial tobacco and nicotine control policies (see Appendix A) and explored the grey literature to both identify existing policies at the federal and provincial levels, as well as determine some of the priority areas for action for a renewed smoking and nicotine strategy. SMDHU also conducted a conversation with key informants, the key points of which were summarized through the lens of an adapted version of the World Health Organization's MPOWER framework[2] (see Appendix B).[36]

Given the relative recency of vaping as a phenomenon, evidence is emerging related to the effectiveness of interventions to reduce vaping[23,37–41] as well the cost-effectiveness of doing so.[42] Lessons learned from interventions used to combat commercial tobacco use may also be applied to address vaping.[40] However, evaluation will be needed to confirm effectiveness. There have already been a variety of effective

[2] The World Health Organization Framework Convention on Tobacco Control (FCTC) is a legally binding international health treaty on tobacco control, which 182 countries including Canada have ratified.[35] To help countries reduce demand for tobacco, the WHO developed the MPOWER measures: Monitor tobacco use and prevention policies; Protect people from tobacco smoke; Offer help to quit tobacco use; Warn about the dangers of tobacco; Enforce bans on tobacco advertising, promotion and sponsorship; and Raise taxes on tobacco.[36]

commercial tobacco and nicotine control interventions implemented in Ontario and other Canadian jurisdictions over the years, but a coordinated, comprehensive, multi-level, evidence-informed, and enduring strategy is needed to achieve the target of less than 5% tobacco use by 2035. Such a strategy would continue to be informed by evidence and focus on the traditional pillars of prevention, cessation, and protection, as well as industry denormalization and engagement of disproportionately impacted groups such as First Nations, Inuit and Métis (FNIM) organizations and communities.[3,9,34,43,44] However, for such a strategy to work, there must be provincial and federal commitments to strong regulations around all alternative methods of nicotine delivery. In particular, the Council of the Chief Medical Officers of Health has recommended a "broad regulatory approach to all alternative methods of nicotine delivery (i.e. other than tobacco products) that offers strong youth protection while allowing appropriate access for adult who smoke to products if they are proven effective in decreasing or stopping the use of all nicotine-containing products."[45]

7. Conclusion

Despite significant progress in commercial tobacco control, the health and economic burdens of tobacco-related disease in Canada remain unconscionably high. Moreover, vaping, waterpipe smoking, and cannabis smoking have added further complexity to the smoking and nicotine control landscape that risks undoing the tremendous progress that has been made. A coordinated, comprehensive, and enduring provincial smoking and nicotine control strategy is needed to save lives, protect young minds, reduce health inequities, and save money.

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Appendix A: Jurisdictional Scan of Tobacco and Nicotine Control Policies in Canada

Summary: A jurisdictional scan of Canadian federal, provincial, and territorial tobacco and nicotine control strategies was performed. An array of pre-existing documents[32,46–48] (environmental scans, briefing notes, etc.) produced by Physicians for a Smoke-Free Canada (PSC) cover similar objectives, and therefore constitute a major contribution to this scan. Overall, strategies have continued to focus on efforts surrounding the four pillars of prevention, cessation, protection and denormalization, with varying degrees of emphasis on each. However, the last few years have seen a deceleration in commercial tobacco control efforts, while vaping products have taken the spotlight, particularly following the amendment of the *Tobacco Act* in 2018 to become the *Tobacco and Vaping Products Act* (TVPA).

With respect to commercial tobacco control, the following recent changes have occurred at the federal, provincial, and/or territorial levels:

- plain and standardized packaging
- enhanced package health warnings
- ban on flavours in cigarettes and most cigars including menthol and cloves
- additional contraband measures in some jurisdictions

With respect to vaping control, the following recent changes have occurred at the federal, provincial, and/or territorial levels:

- taxes on vaping products
- retail licensing/registration
- minimum age restrictions
- requiring proof of age in stores
- display bans in stores
- restriction to sale in specialty vape stores
- bans on internet sales
- bans on incentives to retailers
- bans on non-tobacco flavours
- bans on various forms of advertisement
- restrictions on nicotine content
- health warnings

There are also plans at the federal level for implementing "reporting requirements that would require vaping product manufacturers to submit information to Health Canada about sales and ingredients used in vaping products."[4]

Limitations: While such a scan would be most useful if it summarized the implementation of the jurisdictional strategies that were identified (in addition to effects of implementation, technical feasibility, political viability, alignment with the Canadian regulatory landscape, etc.), the scan was largely limited to information that could be gleaned from web-based searches of the grey literature. Furthermore, jurisdictions outside of Canada such as New Zealand,[49] Australia,[50,51] Finland[52] and California[53] may provide further insights into tobacco and nicotine control, but were not covered in this scan.

Table A1: Jurisdictional Scan Results

F/P/T	Strategic Document	Alignment with Endgame Target[47] (less than 5% by 2035)	Recent Policy Implementation[4,32,44,46] (listed if not already implemented in Ontario)
Fed	Canada's Tobacco Strategy[2] (2018)	• Supports endgame goal of less than 5% by 2035. • Note: In 2020/2021, Health Canada changed its progress indicator from "percentage of Canadians (aged 15+) who have used any tobacco product in the last 30 days" to "Percentage of Canadians (aged 15+) who are current cigarette smokers."[54]	• Vaping products: ban on ads in stores (except age-restricted stores), display ban, ban on broadcast ads, ban on billboards/outdoor signs, ban on lifestyle ads, ban on sponsorships, ban on youth-appealing ads, health warnings / labelling requirements, restriction on nicotine content (max 20 mg/mL), excise tax, plan to ban all flavours except tobacco and mint-menthol, plan to impose vaping product reporting requirements, compliance and enforcement activities • Tobacco products: Plain and standardized packaging, enhanced package health warnings, ban on flavours in cigarettes and most cigars including menthol and cloves
BC	BC's Tobacco Control Strategy: targeting our efforts[55]	• No endorsement of endgame goal • BC's 2013 Guiding Framework for Public Health[56] targets a reduction of smoking to 10% by 2023. • In the 2018 report First to 5% by 2035[57], the Clean Air Coalition of BC recommended that BC be the first jurisdiction to achieve 5% by 2035, but there is no evidence of endorsement by government.	• Vaping products: tax, retail notification and reporting requirement, sale of flavoured products restricted to specialty vape stores, ban on sale and use in some public premises • Tobacco products: subsidized nicotine replacement therapy (NRT) to all residents, second highest level of overall taxation on cigarettes ($15.30 for a 20-pack), highly regarded stop-smoking service model, some exemplary practices in Indigenous stewardship
AB	Creating Tobacco-free Futures: Alberta's Strategy to Prevent and Reduce Tobacco Use 2012-2022[58]	• No endorsement of endgame goal • 10-year targets set for 2022: - Albertans ages 15 and over: 12 % - Albertans ages 12 to 19: 6% - Albertans ages 20 to 24: 20% - Pregnant women in Alberta: 11%	• Vaping products: ban on possession below minimum legal age, ban on sale in some public premises, ban on use in most public premises including outdoor cultural events

F/P/T	Strategic Document	Alignment with Endgame Target[47] (less than 5% by 2035)	Recent Policy Implementation[4,32,44,46] (listed if not already implemented in Ontario)
		- Reduce estimated per capita tobacco sales by 50 per cent to 745 units in 2022.	
SK	No strategic document identified. Public-facing Information available on their Tobacco and Vapour Products webpage.	• No endorsement of endgame goal • The Saskatchewan Coalition for Tobacco Reduction produced a report entitled Protecting our Future: Recommendations to reduce tobacco use in Saskatchewan, but this document does not appear to have been endorsement by government.	• Vaping products: tax, ban on sale and use in some public premises
MB	No strategic document identified. Public-facing information available on their Smoking, Vaping Control & Cessation webpage.	• No endorsement of endgame goal	• Vaping products: ban on sale and use in some public premises
ON	Smoke-Free Ontario: The Next Chapter - 2018[30] Note: This strategy was neither adopted nor implemented by the present government.	• No endorsement of endgame goal • Reduce smoking to 10% by 2023 • Reduce the number of smoking-related deaths by 5,000 each year. • Reduce exposure to the harmful effects of tobacco and the potentially harmful effects of other inhaled substances and emerging products (including medical cannabis).	• Vaping products: retail registration with local public health unit required for sale of flavoured products (not tobacco or mint-menthol), sale of flavoured products (except tobacco and menthol) restricted to specialty vape stores, ban on sale in several public premises, ban on use in most public premises (post-secondary institutions excluded) • Tobacco products: additional contraband measures
QC	Stratégie pour un Québec sans tabac 2020-2025[59] (see Appendix A for summary English translation)	• No endorsement of endgame goal • Reduce smoking to 10% by 2025.	• Vaping products: retail notification requirement, ban on internet sale and on incentives to vaping product retailers, ban on sale in most public premises, ban on use in many public premises • Tobacco products: subsidized nicotine replacement therapy (NRT) to all residents
NB	New Brunswick's Tobacco-Free	• **Supports endgame goal of less than 5% by 2035.**	• Vaping products: retail licensing/registration, ban on all

F/P/T	Strategic Document	Alignment with Endgame Target[47] (less than 5% by 2035)	Recent Policy Implementation[4,32,44,46] (listed if not already implemented in Ontario)
	Living Strategy: A Tobacco and Smoke-Free Province for All[60] (2019-2023) was produced by the NB Anti-Tobacco Coalition, funded by the Government of NB.		flavours except tobacco, ban on use in most public premises
NS	Moving toward a Tobacco-Free Nova Scotia: Comprehensive Tobacco Control Strategy for Nova Scotia[61] (2011) Public-facing information available on their Tobacco Free Nova Scotia webpage.	• No endorsement of endgame goal • Decrease tobacco use rates individuals aged 15-19 years to 10%, 20-24 years to 20%, and 25 years and older to 15%.	• Vaping products: retail licensing/registration, tax, ban on all flavours except tobacco, ban on sale and use in most public premises (post-secondary institutions included)
PEI	No strategic document specific to tobacco control identified. Tobacco control is addressed in PEI's Wellness Strategy[62] (2015-2018)	• No endorsement of endgame goal	• Vaping products: Sale restricted to age 21 years and above and only in specialty stores, ban on all flavours except tobacco, ban on sale in many public premises, ban on use in several public premises (post-secondary institutions included)
NL	Tobacco and Vaping Reduction Strategy[63] (2021) produced by the Newfoundland and Labrador Alliance for the Control of Tobacco, which is an alliance of government and non-government partners.	• No endorsement of endgame goal Action areas: • Community capacity building • Education and awareness • Healthy public policy • Cessation and treatment services • Research, monitoring and evaluation	• Vaping products: retail licensing/registration, tax, ban on sale in many public premises, ban on use in several public premises (post-secondary institutions included) • Highest level of overall taxation on cigarettes ($15.71 for a 20-pack)
YT	No strategic document identified. Public-facing information available on	• No endorsement of endgame goal	• Vaping products: ban on use in many public premises

F/P/T	Strategic Document	Alignment with Endgame Target[47] (less than 5% by 2035)	Recent Policy Implementation[4,32,44,46] (listed if not already implemented in Ontario)
	government webpage.		
NWT	No strategic document identified. Public-facing information available on Tobacco Control webpage.	• No endorsement of endgame goal	• Vaping products: ban on all flavours except tobacco, ban on possession below minimum legal age, ban on sale in some public premises, ban on use in many public premises
NU	Nunavut Tobacco Reduction Framework for Action[64] (2011-2016)	• No endorsement of endgame goal • Guiding principles draw from Inuit culture and practices. • Supports a coordinated communications plan using a range of media tools and using both universal and targeted approaches (including youth, pregnant women and their partners, and parents and Elders). • Younger age group is targeted through school and community youth programs because youth initiate tobacco use largely between 8 and 16 years of age.	• Vaping products (per Tobacco and Smoking Act[65], which received Assent on June 8, 2021, but is not anticipated to come into force until 2023): plan to consider vaping product price restrictions, plan to ban incentives to vaping product retailers, plan to ban sale and use in most public premises, plan to ban all flavours except tobacco and any product designed for use as flavouring for any smoking product, plan to make all publicly funding housing smoke-free, plan for biennial reporting requirements for vape retailers

Appendix B: Priorities for a Provincial Smoking and Nicotine Strategy — Key Informant Conversation Summary

To inform the call for a renewed and comprehensive provincial commercial tobacco and nicotine strategy, the Simcoe Muskoka District Health Unit (SMDHU) conducted a conversation on November 17, 2022, with a panel of key informants with extensive experience in commercial tobacco control in Ontario and Canada, in addition to following up individually upon request from some key informants for further discussion. The meeting was framed as an informal discussion around commercial tobacco and nicotine control, using past strategies and reports as a springboard to identify provincial priorities for a renewed commercial tobacco and nicotine strategy, as well as federal priorities to address relevant policy gaps.

Participants included:

- John Atkinson, Executive Director, Ontario Public Health Association
- Cindy Baker-Barill, Smoke-Free Program Manager, Smoke-Free Program and Central East Tobacco Control Area Network, Environmental Health Department, SMDHU
- Hillary Buchan-Terrell, Advocacy Manager (Ontario), Canadian Cancer Society
- Cynthia Callard, Executive Director, Physicians for a Smoke-Free Canada
- Vito Chiefari, Manager, Health Protection, Community & Health Services Dept, York Region
- Rob Cunningham, Senior Policy Analyst, Canadian Cancer Society
- Dr. Charles Gardner, Medical Officer of Health and Chief Executive Officer, SMDHU
- Dr. Lesley James, Director, Health Policy & Systems, Heart & Stroke Foundation
- David Neeson, Supervisor, Tobacco and Electronic Cigarette Control Team, Health Protection Division, Community and Health Services, York Region
- Michael Perley, former Director, Ontario Campaign for Action on Tobacco
- Dr. Emil Prikryl, Public Health and Preventive Medicine Resident, NOSM University
- Dr. Steven Rebellato, Vice President, Environmental Health Department, SMDHU
- Dr. Robert Schwartz, Executive Director, Ontario Tobacco Research Unit and Professor, Dalla Lana School of Public Health
- Linda Stobo, Program Manager, Substance Use Program, Healthy Living Division, Middlesex-London Health Unit
- Melissa van Zandvoort, Health Promotion Specialist, Smoke-Free Program and Central East Tobacco Control Area Network, Environmental Health Department, SMDHU

While it is our recommendation that the development of a renewed strategy be supported by a multidisciplinary panel of experts, Table B1 frames the priorities identified during the key informant conversation through the lens of an expanded version of the World Health Organization's MPOWER framework (i.e., MPOWER+):

Table B1: Priorities within the MPOWER+ Framework

MPOWER+ Measure	Priorities
Monitor tobacco and vaping use and prevention, cessation and protection/enforcement programs and policies.	• Re-invest in research/monitoring and evaluation to ensure practice and policy decisions are based on evidence. • Continue to explore age restrictions for smoking and vaping.
Protect people from tobacco smoke and e-cigarette aerosol.	• Further expand smoke- and vape-free public places. • Continue to increase access to smoke- and vape-free housing. • Direct focus towards consumer rights to be protected from marketing of nicotine products.
Offer help to quit smoking and vaping.	• Increase subsidization of smoking cessation pharmacotherapy for all residents.
Warn about the dangers of commercial tobacco and vaping products.	• Implement mass media and social marketing campaigns of greater intensity and duration targeted at youth and young adults addressing the real and potential harms of vaping such as its impacts on mental health, addiction, and environmental waste. • Implement mass media and social marketing campaigns of greater intensity and duration targeted at high-risk populations addressing the harms of smoking and the benefits of quitting.
Enforce bans on commercial tobacco and vaping product advertising, promotion and sponsorship.	• Return the focus of nicotine control efforts to the industry through activities such as leveraging litigation opportunities to further denormalize the industry and hold industry accountable for past and future harms to society. • Ban all flavours except tobacco flavour (if not achieved federally). • Restrict availability in brick-and-mortar settings and online access. • Strengthen retail registration and licensing requirements. • Further regulate vaping product design (e.g., plain and standardized packaging for vaping, health warnings). • Intensify tobacco and vaping product advertising promotion and sponsorship bans.

MPOWER+ Measure	Priorities
	• Ensure continued funding for enforcement through the *Smoke-Free Ontario Act, 2017*.
Raise taxes on commercial tobacco and vaping products.	• Implement a tax on vaping products, as well as regulatory fees as a means of cost recovery. • Further increase taxes on combustible tobacco products.
+ **Add** a strong health equity lens by linking commercial tobacco and nicotine control approaches to broader objectives addressing health inequities. **Add** bold interventions as indicated by evidence to further reduce the supply, demand, and access of all current and future industry nicotine delivery systems.	• Address the disproportionate use of commercial tobacco and nicotine use and associated health burdens among Indigenous populations, members of the LGBTQ2S+ community, youth, low-income populations, people with less formal education, people working in certain occupations (e.g., trades), individuals with mental health needs, individuals who use other substances, and incarcerated individuals. • Implement recommendations from the Council of Chief Medical Officers of Health to develop a "broad regulatory approach to all alternative methods of nicotine delivery (i.e. other than tobacco products) that offers strong youth protection while allowing appropriate access for adult smokers to products if they are proven effective in decreasing or stopping the use of all nicotine-containing products."[45]

alPHa
Association of Local PUBLIC HEALTH Agencies

alPHa RESOLUTION A11-1

TITLE: **Conduct a Formal Review and Impact Analysis of the Health and Economic Effects of Alcohol in Ontario and Thereafter Develop a Provincial Alcohol Strategy**

SPONSOR: **Middlesex-London Board of Health**

WHEREAS There is a well-established association between easy access to alcohol and overall rates of consumption and damage from alcohol; and (Barbor et al., 2010)

WHEREAS Ontario has a significant portion of the population drinking alcohol (81.5%), exceeding the low risk drinking guidelines (23.4%), consuming 5 or more drinks on a single occasion weekly (11.2%), and reporting hazardous or harmful drinking (15.6%); and (CAMH Monitor)

WHEREAS Ontario youth (grades 9-12) have concerning levels of alcohol consumption with 69.4% having drank in the past year, 32.9% binge drinking (5 or more drinks), and 27.5% of students reporting drinking at a hazardous level; and (OSDUHS Report)

WHEREAS Each year alcohol puts this province in a $456 million deficit due to direct costs related to healthcare and enforcement; and (G. Thomas, CCSA)

WHEREAS Billions of dollars are spent each year in Canada on indirect costs associated with alcohol use (illness, disability, and death) including lost productivity in the workplace and home; and (The Costs of Sub Abuse in CAN, 2002)

WHEREAS Nearly half of all deaths attributable to alcohol are from injuries including unintentional injuries (drowning, burns, poisoning and falls) and intentional injuries (deliberate acts of violence against oneself or others); and (WHO – Alcohol and Injury in EDs, 2007)

WHEREAS Regulating the physical availability of alcohol is one of the top alcohol policy practices in reducing harm; and (Barbor et al., 2010)

WHEREAS The World Health Organization (WHO, 2011) has indicated that alcohol is the world's third largest risk factor for disease burden and that the harmful use of alcohol results in approximately 2.5 million deaths each year. Alcohol is associated with increased levels of health and social costs in Ontario and is causally related to over 65 medical conditions;

NOW THEREFORE BE IT RESOLVED that the Association of Local Public Health Agencies (alPHa) petition the Ontario government to conduct a formal review and impact analysis of the health and economic effects of alcohol in Ontario and develop a provincial Alcohol Strategy.

ACTION FROM CONFERENCE: **Resolution CARRIED**

alPHa
Association of Local
PUBLIC HEALTH
Agencies

alPHa RESOLUTION A22-4

TITLE: **Priorities for Provincial Action on the Drug/Opioid Poisoning Crisis in Ontario**

SPONSOR: **Council of Ontario Medical Officers of Health (COMOH)**

WHEREAS the ongoing drug/opioid poisoning crisis has affected every part of Ontario, with the COVID-19 pandemic further exacerbating the issue, leading to a 73% increase in deaths from opioid-related toxicity from 2,870 deaths experienced in the 22 months prior to the pandemic (May 2018 to February 2020) to 4,951 deaths in the 22 months of available data since then (March 2020 to December 2021); and

WHEREAS the burden of disease is particularly substantial given the majority of deaths that occurred prior to the pandemic and the increase during the pandemic have been in young adults, in particular those aged 25-44, and the extent of the resulting trauma for families, front line responders, and communities as a whole cannot be overstated; and

WHEREAS the membership previously carried resolution A19-3, asking the federal government to decriminalize the possession of all drugs for personal use based on broad and inclusive consultation, as well as supporting robust prevention, harm reduction and treatment services; and

WHEREAS the membership previously carried resolution A21-2, calling on all organizations and governmental actors to respond to the opioid crisis with the same intensity as they did for the COVID-19 pandemic; and

WHEREAS the Association of Local Public Health Agencies (alPHa) has identified that responding to the opioid crisis is a priority area for local public health recovery in their *Public Health Resilience in Ontario* publication (Executive Summary and Report); and

WHEREAS recognizing that any responses to this crisis must meaningfully involve and be centred-around people who use drugs (PWUDs), inclusive of all backgrounds, and must be founded not only on evidence- and trauma-informed practices but also equity, cultural safety, anti-racism as well as anti-oppression; and

WHEREAS COMOH's Drug / Opioid Poisoning Crisis Working Group has recently identified nine provincial priorities for a robust, multi-sector response that is necessary in response to this crisis (see Appendix A); and

WHEREAS local public health agencies are well positioned, with additional resourcing, to play an enhanced role in local planning, implementation and coordination of the following priority areas: harm reduction, substance use prevention and mental health promotion, analysis, monitoring and reporting of epidemiological data on opioid and other substance-

related harms, health equity and anti-stigma initiatives, efforts towards healthy public policy related to substance use including but not limited to decriminalization, and providing and mobilizing community leadership; and

WHEREAS this work of local public health agencies aligns with the Substance Use and Harm Reduction Guideline (2018) and the Health Equity Guideline (2018) under the Ontario Public Health Standards;

THEREFORE BE IT RESOLVED that alPHa endorse the nine priorities for a provincial multi-sector response;

AND FURTHER that the noted provincial priorities and areas of contribution by local public health agencies be communicated to the Premier, Minister of Health, Associate Minister of Mental Health & Addictions, Attorney General, Minister of Municipal Affairs & Housing, Minister of Children, Community & Social Services, Chief Medical Officer of Health, Chief Executive Officer (CEO) of Ontario Health and CEO of Public Health Ontario;

AND FURTHER that alPHa urge the above mentioned parties to collaborate on an effective, well-resourced and comprehensive multi-sectoral approach, which meaningfully involves and is centred-around PWUDs from of all backgrounds, and is based on the nine identified provincial priorities.

AND FURTHER that alPHa recommend the provincial government consider the potential role and appropriate timing of declaring the drug poisoning crisis in Ontario as an emergency under the Emergency Management and Civil Protection act (R.S.O. 1990).

CARRIED AS AMENDED

Appendix A – Priorities for a Provincial Multi-Sector Response

The following was developed by the Drug / Opioid Poisoning Crisis Working Group of COMOH, and shared with the COMOH membership for review at its general meeting on April 27th, 2022:

1. Create a **multi-sectoral task force**, including people with lived experience of drug use, to guide the development of a robust, integrated provincial drug poisoning crisis response plan. The plan should ensure necessary resourcing, health and social system coordination, policy change, and public reporting on drug-related harms and the progress of the response. An **integrated approach** is essential, to address the overlap between the use of various substances, to integrate aspects of the response such as treatment and harm reduction, and to ensure a common vision for addressing health inequities and preventive opportunities.

2. Expand access to **harm reduction** programs and practices (e.g. Consumption and Treatment Service (CTS) sites, Urgent Public Health Needs Sites (UPHNS), drug checking, addressing inhalation methods as a key route of use and poisonings, and exploring the scale up of safer opioid supply access).

3. Enhance and ensure sustainability of support for substance use **prevention** and mental health promotion initiatives, with a focus from early childhood through to adolescence.

4. Expand the collection, analysis and reporting of timely integrated **epidemiological data** initiatives, to guide resource allocation, frontline programs and services, and inform healthy public policy.

5. Expand access to **treatment** for opioid use disorder, including opioid agonist therapy in a range of settings (e.g., mobile outreach, primary care, emergency departments) and a variety of medication options (including injectable). To support the overall health of PWUDs, also connect with and expand access to care for other substances, for mental illness and trauma as key risk factors for drug use, and for comprehensive medical care for PWUDs.

6. Address the structural **stigma**, discrimination and related harms that create systemic barriers for PWUDs, through re-orienting systems for public health, first responders, health care, and social services, to address service provider and policy-level stigma, normalize services for drug use, and better meet the needs of PWUDs. Also, support community and community leadership conversations to address drug use stigma and its societal consequences.

7. Advocate to and support the Federal government to **decriminalize** personal use and possession of substances, paired with increased investments in health and social services and a focus on health equity at all levels. These efforts aim to address the significant health and social harms of approaches that criminalize PWUDs, including Black, Indigenous and other racialized communities.
8. Acknowledge and address **socioeconomic determinants of health**, **systemic racism**, and their intersections that are risk factors for substance use and substance use disorders, and pose barriers to accessing supports. This includes a need for more affordable and supportive **housing** for PWUDs, and efforts to further address **poverty** and **unemployment/precarious employment**.

9. Provide funding and other supports to enable consistent **community leadership** by PWUDs and by community organizations, including engagement with local drug strategies. People who bring their lived experience should be paid for their knowledge contribution and participation at community tables.

alPHa
Association of Local PUBLIC HEALTH Agencies

alPHa RESOLUTION A19-3

TITLE: **Public Health Approach to Drug Policy**

SPONSOR: **Toronto Public Health**

WHEREAS governments around the world are considering different approaches to drugs, including the decriminalization of drug use and possession and legal regulation, including here in Canada for non-medical cannabis; and

WHEREAS a growing number of health officials and boards of health are calling for changes to our approach to drugs, especially in the midst of the opioid poisoning crisis in which the contaminated, unregulated supply of illegal drugs is the main contributor to the crisis; and

WHEREAS laws that criminalize people simply for using and possessing drugs have resulted in serious health and social harms, including forcing people into unsafe spaces and high-risk behaviours leading to HIV and HCV infection, resulting in criminal records that make it difficult to obtain employment and housing, and reinforcing negative stereotypes and judgements about people who use drugs; and

WHEREAS some groups are more impacted by our drug laws than others, including people who are homeless and/or living in poverty, people with mental health and substance use issues, people from racialized groups, Indigenous people, women and youth; and

WHEREAS a public health approach to drugs would be based on principles and strategies that have been shown to support healthy individuals, families and communities; and

WHEREAS countries that have decriminalized personal drug use and possession and invested in public health interventions have seen results, including decreases in HIV and overdose, decreases in costs to the criminal justice system, and improved police/community relationships; and

WHEREAS the evidence on the health and social harms of our current criminalization approach to illegal drugs as well as that of alternative approaches such as decriminalization and legal regulation strongly support the need to shift to a public health approach to drugs in Canada;

NOW THEREFORE BE IT RESOLVED that the federal government be urged to decriminalize the possession of all drugs for personal use, and scale up prevention, harm reduction and treatment services;

AND FURTHER that the federal government convene a task force, comprised of people who use drugs, family members, and policy, research and program experts in the areas of public health, human rights, substance use, mental health, and criminal justice, to explore options for the legal regulation of all drugs in Canada, based on a public health approach.

ACTION FROM CONFERENCE: Carried as amended

alPHa
Association of Local PUBLIC HEALTH Agencies

alPHa RESOLUTION A19-8

TITLE: **Promoting Resilience through Early Childhood Development Programming**

SPONSORS: **Northwestern Health Unit**
Thunder Bay District Health Unit
Middlesex-London Health Unit

WHEREAS one in five Canadians are affected by mental illness or an addiction issue every year, and the burden of illness is more than 1.5 times the burden of all cancers and 7 times the burden of all infectious diseases; and

WHEREAS suicide is the second leading cause of mortality among young Canadians aged 10-24 and suicide accounted for 24% of all deaths among youth 15 to 24 years old from 2009-2013; and

WHEREAS there were more than 9,000 deaths in Canada from 2016 to 2018 and more than 1,250 deaths in Ontario in 2017 related to opioids; and

WHEREAS the annual economic burden of mental illness is approximately 51 billion in Canada with a substantial impact on emergency room departments and hospitals; and

WHEREAS 70% of mental health and substance use problems begin in childhood; and adverse childhood experiences, such as poor attachment to parents, child abuse, family conflict and neglect, have been clearly linked to risk for mental illness and addiction later in life; and

WHEREAS programming that enhances the early childhood experience has proven benefits in IQ levels, educational achievements, income levels, interactions with the criminal justice system and utilization of social services; and

WHEREAS every $1 invested in early childhood development can save $9 in future spending on health, social and justice services; and

WHEREAS the Healthy Babies Healthy Children (HBHC) program is a prevention/early intervention initiative designed to ensure that all Ontario families with children (prenatal to the child's transition to school) who are at risk of physical, cognitive, communicative, and/or psychosocial problems have access to effective, consistent, early intervention services; and

WHEREAS the HBHC program provides home visiting services and home visiting programs have demonstrated effectiveness in enhancing parenting skills and promoting healthy child development in ways that prevent child maltreatment; and

WHEREAS the HBHC program supports the early childhood experience and development of resiliency by enhancing the parent-child attachment, parenting style, family relationships, and financial instability and addressing parental mental illness and

substance misuse, child abuse or neglect thereby reducing the risk of subsequent mental illness and addictions; and

WHEREAS in 1997 the province committed to funding the Healthy Babies Healthy Children program at 100% and the HBHC budget has been flat-lined since 2008 with the exception of increased base funding in 2012 for an increase in public health nursing positions for Healthy Babies Healthy Children program as part of the 9,000 Nurses Commitment; and

WHEREAS fixed costs such as salaries and benefits, travel, supplies, equipment and other operational costs have increased the costs of operating the HBHC program, and

WHEREAS operating the HBHC program with the existing funding has become increasingly more challenging and will result in reduced services for high-risk families if increased funding is not provided;

NOW THEREFORE BE IT RESOLVED that the Association of Local Public Health Agencies (alPHa) actively engage with the Ministry of Children, Community and Social Services, the Ministry of Health and Long term Care, and the Premier's Council on Improving Health Care and Ending Hallway Medicine to support investments in early childhood development as a strategy to enable health and resiliency throughout life, promote mental health and reduce mental illness and addictions;

AND FURTHER that alPHa engage with the Ministry of Children, Community and Social Services, the Ministry of Health and Long term Care, and the Premier's Council on Improving Health Care and Ending Hallway Medicine to urgently support adequate funding (including staffing and operational costs) of the Healthy Babies Healthy Children program as a strategic immediate action to enhance the early childhood experience and address mental illness and addictions in Ontario;

AND FURTHER that the Chief Medical Officer of Health of Ontario, Ontario Public Health Association, Centre for Addictions and Mental Health and other relevant partner agencies be so advised.

ACTION FROM CONFERENCE: Carried as amended

TITLE: **Indigenous Harm Reduction: A Wellness Journey**

SPONSOR: **Haliburton Kawartha Pine Ridge District Health Unit**

WHEREAS The burden of harm associated with substance use among Indigenous peoples is far reaching. From 2009 to 2019 there has been a 480% increase in hospital visits related to opioid poisoning for First Nation peoples compared to 164% for non- First Nation peoples. The rate of hospital visits for opioid-related poisoning among First Nation peoples totaled 45.1 per 10,000. First Nation peoples living outside of First Nations communities experienced the highest rate of hospital visits for opioid-related poisoning at 57.5 per 10,000 people. The rate of hospital visits for opioid-related poisoning among First Nation peoples living within First Nations communities was 19.6 per 10,000 people, and the rate among non-First Nation peoples was 6.0 hospital visits per 10,000 people. There is a gap in readily available Ontario surveillance data specific to alcohol, prescription drug, and other substance misuse in addition to data specific to registered and non-registered status First Nation peoples, Inuit and Metis.

WHEREAS The increased burden of harm associated with substance use among Indigenous peoples can be directly attributed to historical and ongoing colonial violence perpetrated against Indigenous peoples. It is deeply rooted in colonization, disenfranchisement, the Indian residential school system, the 60's scoop, intergenerational trauma, forced removal from land, and oppression. The health system has been a key tool utilized in the violence against Indigenous peoples, resulting in mistrust in the health system by Indigenous populations. As a result, public health units must adapt and decolonize their approaches when working with Indigenous populations and work alongside communities to develop culturally-based and trauma-informed Indigenous harm reduction strategies.

WHEREAS In 2017 alPHa passed a resolution on the Truth and Reconciliation: Calls to Action. The resolution requested alPHa to modify and reorient public health intervention to be culturally safe for Indigenous peoples, and to advocate to ensure that Ontario's Indigenous peoples have more equitable access to the social determinants of health as well as access to culturally safe health care and Aboriginal healing practices. Harm Reduction is a public health priority written in the Ontario Public Health Standards and Guidelines.

WHEREAS Inequities of culturally based Indigenous harm reduction, prevention, and treatment exist for Indigenous peoples in Ontario. There is a lack of integrated land-based harm reduction service provision, lack of Indigenous specific safe consumption services, and lack of public awareness and education on Indigenous harm reduction. There are barriers and limited access to local Treatment and Healing Centres across Ontario.

WHEREAS Indigenous Harm reduction policies, programs, and practices must be grounded in local Indigenous knowledges, traditions, teachings, ceremonies, land, and languages which are unique to each community. Evidence suggests that culturally based harm reduction interventions for Indigenous peoples, including access to local Treatment and Healing Centres, are beneficial to help improve functioning in all areas of wellness.

THEREFORE BE IT RESOLVED that the Association of Local Public Health Agencies recognize the critical importance of working with Indigenous communities to better understand Indigenous harm reduction and adopt policies, practices and programs for harm reduction that are culturally safe and rooted in community-knowledge and needs.

AND FURTHER that the Association of Local Public Health Agencies advocate with Indigenous partners to the Minister of Health and other appropriate government bodies for additional funding to support Indigenous harm reduction including additional Indigenous Treatment and Healing Centres.

CARRIED AS AMENDED

alPHa Resolution A22-5 - Backgrounder
Submitted by: Haliburton, Kawartha, Pine Ridge District Health Unit

Backgrounder – Indigenous Harm Reduction: A Wellness Journey

Substance use within Indigenous populations is rooted in colonization, disenfranchisement, the Indian residential school system, the 60's scoop, intergenerational trauma, forced removal from land, and oppression. In 2016, the government of Ontario adopted the Truth and Reconciliation: Calls to action[1]. Call to Action # 19 and #20 speak to the recognition of the right to optimum health regardless of residence, and #21 calls to provide funding for sustainable Healing Centres. In 2017, the Association of Local Public Health Agencies (alPHa) adopted the Truth and Reconciliation recommendations and committed to assisting member boards of health to modify and reorient public health interventions to be culturally safe for Indigenous peoples, and to advocate to ensure that Ontario's Indigenous peoples have more equitable access to the social determinants of health as well as access to culturally safe health care and Aboriginal healing practices[2].
The burden of harm associated with substance use among Indigenous peoples is far reaching. From 2009 to 2019 there has been a 480% increase in hospital visits related to opioid poisoning for First Nation peoples compared to 164% for non- First Nation peoples[3]. In 2019, the rate of hospital visits for opioid-related poisoning among First Nation peoples totaled 45.1 per 10,000. First Nation peoples living outside of First Nations communities experienced the highest rate of hospital visits for opioid-related poisoning at 57.5 per 10,000 people. The rate of hospital visits for opioid-related poisoning among First Nation peoples living within First Nations communities was 19.6 per 10,000 people, and the rate among non-First Nation peoples was 6.0 hospital visits per 10,000 people[3]. While opioid poisoning data is readily available, there is a need to establish epidemiological surveillance to address other substances such as cannabis, prescription drugs, and alcohol use also impacting the health of Indigenous peoples. Additional data is needed to understand substance use trends among registered and non-registered status First Nation peoples, Inuit, and Metis.
Harm Reduction is a public health priority within the Ontario Public Health Standards and Guidelines[4]. A public health response to the current epidemic of opioid poisonings has been highlighted as a priority as communities work to recover from the COVID-19 pandemic. alPHa Resolution A21-2[5] called on public health to lead and coordinate the response to address the opioid crisis, capitalizing on the momentum of managing the COVID-19 emergency.

In Public Health, harm reduction refers to policies, programmes and practices that aim primarily to reduce the adverse health, social and economic consequences of the use of legal and illegal psychoactive drugs without necessarily reducing substance consumption. Harm reduction interventions respect the rights of individuals to use such substances, increase awareness regarding lower risk use, and address risk and protective factors related to harms[6].

Emerging substance use trends articulate the need to adopt policy solutions based on evidence-informed harm reduction and treatment practices, eliminating structural stigma, investing in prevention, and declaring the opioid poisoning crisis an emergency[7]. The policy approach is grounded in public health principles.

Indigenous harm reduction policies, programs, and practices must be grounded in local Indigenous knowledges, traditions, teachings, ceremonies, land, and languages which are unique to each community[8]. To this end, it is important that public health units not re-inscribe colonial systems but work with Indigenous communities to understand what harm reduction means for them and establish approaches that are specific to community needs. Indigenous harm reduction is reducing the harms of colonization and colonialism[8]. Evidence supports utilizing land-based service delivery models[9], Wellness Circles[10], and Feather Carriers Wise Practices[11] that involve a wellness journey connected to ceremony, land, water, spirit, community, and family. Healing spaces that offer a wholistic approach with a Traditional Indigenous Healer/Elder/Knowledge Keeper who conducts lands-based teachings, sweat lodge ceremony, traditional healing ceremony, and other culturally appropriate ceremonies and teachings are

key to some Indigenous harm reduction programs[12,13]. In addition, for some communities the use of safe consumption sites supports prevention of overdose and death.

In 2022, Ontario announced the Addictions Recovery fund focused on building quality client centred mental health and addiction system services[14]. Funding was allocated to Northern Rural communities and Indigenous Treatment and Healing Centres were established[15]. Despite increased investment, there are still gaps in access to Treatment and Healing Centres (e.g. Southeastern Ontario) as well as to the broader array of culturally safe harm reduction policies, practices and programs. Barriers such as long waitlists, unclear approval criteria, costs of transportation, and application barriers remain to access current Treatment and Healing Centres.

In addition, there is a lack of awareness and understanding of Indigenous approaches to harm reduction throughout public health in Ontario. By further establishing robust surveillance of substance use harms, adopting Indigenous harm reduction strategies for health promotion, utilizing culturally based education and awareness resources, and working to advocate for equitable access to 'safe consumption sites' and Treatment and Healing Centres, alPHa will support boards of health in working towards the Truth and Reconciliation Calls to Action.

Ministry of Health

Office of the Deputy Premier
and Minister of Health

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Ministère de la Santé

Bureau du vice-premier ministre
et du ministre de la Santé

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Ontario

March 28, 2024

e-Approve-72-2024-632

Mayor Andrea Horwath
Chair, Board of Health
City of Hamilton, Public Health Services
71 Main Street West
Hamilton ON L8P 4Y5

Dear Mayor Horwath:

I am pleased to advise you that the Ministry of Health will provide the Board of Health for the City of Hamilton, Public Health Services up to $627,650 in additional base funding for the 2023-24 funding year, up to $1,882,950 in additional base funding for the 2024-25 funding year, and up to $1,086,900 in additional one-time funding for the 2023-24 funding year to support the provision of public health programs and services in your community.

These approvals support the government's commitment towards Strengthening Public Health, including restoring provincial base funding to the level previously provided under the 2020 cost-share formula, effective January 1, 2024, and providing 1% growth base funding for the 2024 calendar year.

The Executive Lead of the Office of Chief Medical Officer of Health, Public Health Division will write to the City of Hamilton, Public Health Services shortly concerning the terms and conditions governing the funding.

Thank you for the important service that your public health unit provides to Ontarians, and your ongoing dedication and commitment to addressing the public health needs of Ontarians.

Sincerely,

Sylvia Jones
Deputy Premier and Minister of Health

.../2

Mayor Andrea Horwath

c: Dr. Elizabeth Richardson, Medical Officer of Health, City of Hamilton, Public Health Services
Dr. Kieran Moore, Chief Medical Officer of Health and Assistant Deputy Minister
Elizabeth Walker, Executive Lead, Office of Chief Medical Officer of Health, Public Health

Ministry of Health

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Ministère de la Santé

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Ontario

eApprove-72-2024-632

March 28, 2024

Dr. Elizabeth Richardson
Medical Officer of Health
City of Hamilton, Public Health Services
110 King Street West, 2nd Floor
Hamilton ON L8P 4S6

Dear Dr. Richardson:

Re: Ministry of Health Public Health Funding and Accountability Agreement with the Board of Health for the City of Hamilton, Public Health Services (the "Board of Health") dated January 1, 2014, as amended (the "Agreement")

This letter is further to the recent letter from the Honourable Sylvia Jones, Deputy Premier and Minister of Health, in which she informed your organization that the Ministry of Health (the "ministry") will provide the Board of Health with up to $627,650 in additional base funding for the 2023-24 funding year, up to $1,882,950 in additional base funding for the 2024-25 funding year, and up to $1,086,900 in additional one-time funding for the 2023-24 funding year to support the provision of public health programs and services in your community.

This will bring the total maximum funding available under the Agreement for the 2023-24 funding year to up to $43,899,900 ($31,564,700 in base funding and $12,335,200 in one-time funding). Please find attached to this letter a new Schedule A (Grants and Budget), Schedule B (Related Program Policies and Guidelines), Schedule C (Reporting Requirements), and Schedule D (Board of Health Financial Controls) that, pursuant to section 3.3 of the Agreement, shall replace the existing schedules. All terms and conditions contained in the Agreement remain in full force and effect.

These approvals support the government's commitment towards Strengthening Public Health, including restoring provincial base funding to the level previously provided under the 2020 cost-share formula, effective January 1, 2024 ($2,215,800), and providing 1% growth funding for the 2024 calendar year ($294,800). These base funding adjustments are not reflected in the new Schedules accompanying this ministry approval letter. New schedules will be issued when the Board of Health is notified of provincial funding allocations for all other public health programs and services for 2024, at a later date.

…/2

Dr. Elizabeth Richardson

We appreciate your cooperation with the ministry in managing your funding as effectively as possible. You are expected to adhere to our reporting requirements, particularly for in-year service and financial reporting, which is expected to be timely and accurate. Based on our monitoring and assessment of your in-year service and financial reporting, your cash flow may be adjusted appropriately to match actual services provided.

It is also essential that you manage costs within your approved budget.

Please review the new Schedules carefully. Should you require any further information and/or clarification, please contact Brent Feeney, Director, Accountability and Liaison Branch, Office of Chief Medical Officer of Health, Public Health Division, at 416-671-3615 or by email at Brent.Feeney@ontario.ca.

Yours truly,

Elizabeth Walker
Executive Lead

Attachments

c: Mayor Andrea Horwath, Chair, Board of Health, City of Hamilton, Public Health Services
Emma Sydney, Business Administrator, City of Hamilton, Public Health Services
David Trevisani, Manager, Finance and Administration, City of Hamilton, Public Health Services
Dr. Kieran Moore, Chief Medical Officer of Health and Assistant Deputy Minister, MOH
Rayomond Dinshaw, Director (A), Fiscal Oversight and Performance Branch, MOH
Jim Yuill, Director, Financial Management Branch, MOH
Robert Lerch, Director, Vaccine Policy and Programs Branch, MOH
Catherine Wang, Associate Deputy Minister (A), Hospitals and Capital Division, MOH
Jen Simon, Director (A), Health Capital Investment Branch, MOH
Heather Schramm, Director, Health Promotion & Prevention Policy & Programs, MOH
Brent Feeney, Director, Accountability and Liaison Branch, MOH

New Schedules to the
Public Health Funding and Accountability Agreement

BETWEEN THE PROVINCE AND THE BOARD OF HEALTH

(BOARD OF HEALTH FOR THE CITY OF HAMILTON, PUBLIC HEALTH SERVICES)

EFFECTIVE AS OF THE 1ST DAY OF JANUARY 2023

Issued March 2024

Schedule A
Grants and Budget

Board of Health for the City of Hamilton, Public Health Services

DETAILED BUDGET - MAXIMUM BASE FUNDS (GRANTS TO BE PAID SEMI-MONTHLY, FOR THE PERIODS OF JANUARY 1ST TO DECEMBER 31ST AND APRIL 1ST TO MARCH 31ST)			
Programs / Sources of Funding	**Grant Details**	**2023 Grant ($)**	**2023-24 Grant ($)**
Mandatory Programs (Cost-Shared)	• The 2023 Grant includes a pro-rated increase of $202,500 for the period of April 1, 2023 to December 31, 2023 • Per the August 22, 2023 Funding Letter, the 2023-34 Grant includes an annualized increase of $270,000 for the period of April 1, 2023 to March 31, 2024	27,195,200	27,262,700
MOH / AMOH Compensation Initiative (100%)	Cash flow will be adjusted to reflect the actual status of Medical Officer of Health (MOH) and Associate MOH positions, based on an annual application process.	168,000	168,000
Ontario Seniors Dental Care Program (100%)	• The 2023 Grant includes a pro-rated increase of $47,625 for the period of April 1, 2023 to December 31, 2023 • Per the Funding Letter, the 2023-34 Grant includes an annualized increase of $63,500 for the period of April 1, 2023 to March 31, 2024	4,118,125	4,134,000
Total Maximum Base Funds		**31,481,325**	**31,564,700**

DETAILED BUDGET - MAXIMUM ONE-TIME FUNDS (GRANTS TO BE PAID SEMI-MONTHLY, FOR THE PERIOD OF APRIL 1, 2023 TO MARCH 31, 2024, UNLESS OTHERWISE NOTED)			
Projects / Initiatives			**2023-24 Grant ($)**
Cost-Sharing Mitigation (100%) (For the period of January 1, 2023 to December 31, 2023)			2,215,800
Mandatory Programs: Needle Syringe Program (100%)			20,800
Mandatory Programs: Public Health Inspector Practicum Program (100%)			10,000
Mandatory Programs: Smoke-Free Ontario Enforcement Tablet Upgrades (100%)			3,600
COVID-19: General Program Extraordinary Costs (100%) (For the period of January 1, 2023 to December 31, 2023)			3,180,100
COVID-19: Vaccine Program Extraordinary Costs (100%) (For the period of January 1, 2023 to December 31, 2023)			4,656,500
COVID-19: Vaccine Program Enhancement (100%) (For the period of January 1, 2024 to March 31, 2024)			581,900
Ontario Seniors Dental Care Program (100%)			200,000
Ontario Seniors Dental Care Program Capital: Public Health Services Seniors Dental Clinic (100%)			891,500
School-Focused Nurses Initiative (100%) (For the period of April 1, 2023 to June 30, 2023)	# of FTEs	23	575,000
Total Maximum One-Time Funds			**12,335,200**
Total Maximum Base and One-Time Funds[1]			**43,899,900**

2022-23 CARRY OVER ONE-TIME FUNDS[2] (CARRY OVER FOR THE PERIOD OF APRIL 1, 2023 to MARCH 31, 2024)		
Projects / Initiatives	**2022-23 Grant ($)**	**2023-24 Approved Carry Over ($)**
Ontario Seniors Dental Care Program Capital: Public Health Services Seniors Dental Clinic (100%)	157,700	135,700
Total Maximum Carry Over One-Time Funds	**157,700**	**135,700**

NOTES:

(1) Cash flow will be adjusted when the Province provides a new Schedule "A".

(2) Carry over of one-time funds is approved according to the criteria outlined in the provincial correspondence dated March 17, 2023.

SCHEDULE B

RELATED PROGRAM POLICIES AND GUIDELINES

Type of Funding	***Base Funding***

Provincial base funding is provided to the Board of Health for the purposes of delivering public health programs and services in accordance with the Health Protection and Promotion Act (HPPA), Regulations under the HPPA, Ontario Public Health Standards, and the Agreement. Provincial base funding is also provided to the Board of Health for the purposes of delivering related public health programs and initiatives in accordance with Schedule B.

Mandatory Programs: Harm Reduction Program Enhancement

The scope of work for the Harm Reduction Program Enhancement is divided into three components:

1. Local Opioid Response;
2. Naloxone Distribution and Training; and,
3. Opioid Overdose Early Warning and Surveillance.

<u>Local Opioid Response</u>

Base funding must be used to build a sustainable community outreach and response capacity to address drug and opioid-related challenges in their communities. This includes working with a broad base of partners to ensure any local opioid response is coordinated, integrated, and that systems and structures are in place to adapt/enhance service models to meet evolving needs.

Local response plans, which can include harm reduction and education/prevention, initiatives, should contribute to increased access to programs and services, and improved health outcomes (i.e., decrease overdose and overdose deaths, emergency room visits, hospitalizations). With these goals in mind, the Board of Health is expected to:

- Conduct a population health/situational assessment, including the identification of opioid-related community challenges and issues, which are informed by local data, community engagement, early warning systems, etc.
- Lead/support the development, implementation, and evaluation of a local overdose response plan (or drug strategy). Any plan or initiative should be based on the needs identified (and/or gaps) in your local assessment. This may include building community outreach and response capacity, enhanced harm reduction services and/or education/prevention programs and services.
- Engage stakeholders – identify and leverage community partners to support the population health/situational assessment and implementation of local overdose response plans or initiatives. Community stakeholders, including First Nations, Métis and Inuit communities and persons with lived experience, should be meaningfully engaged in the planning and implementation of all initiatives, where appropriate.

Type of Funding	***Base Funding***

- Adopt and ensure timely data entry into the Ontario Harm Reduction Database, including the Transition to the Ontario Harm Reduction Database and ensure timely collection and entry of minimum data set as per direction from the Province.

Naloxone Kit Distribution and Training

The Board of Health (or their Designate) must be established as a naloxone distribution lead/hub for eligible community organizations, as specified by the Province, which will increase dissemination of kits to those most at risk of opioid overdose.

To achieve this, the Board of Health is expected to:

- Order naloxone kits as outlined by the Province; this includes naloxone required by eligible community organizations distributing naloxone.
- Coordinate and supervise naloxone inventory, including managing supply, storage, maintaining inventory records, and distribution of naloxone to eligible community organizations, and ensuring community organizations distribute naloxone in accordance with eligibility criteria established by the Province.
- With the exception of entities (organizations, individuals, etc.) as specified by the Province:
    - Train community organization staff on naloxone administration, including how to administer naloxone in cases of opioid overdose, recognizing the signs of overdose and ways to reduce the risk of overdose. Board of Health staff would also instruct agency staff on how to provide training to end-users (people who use drugs, their friends and family).
    - Train community organization staff on naloxone eligibility criteria, including providing advice to agency staff on who is eligible to receive naloxone and the recommended quantity to dispense.
    - Support policy development at community organizations, including providing consultation on naloxone-related policy and procedures that are being developed or amended within the eligible community organizations.
    - Promote naloxone availability and engage in community organization outreach, including encouraging eligible community organizations to acquire naloxone kits for distribution to their clients.

Use of naloxone (NARCAN® Nasal Spray and injectable naloxone formulations)

The Board of Health will be required to submit orders for naloxone to the Province in order to implement the Harm Reduction Program Enhancement. By receiving naloxone, the Board of Health acknowledges and agrees that:

Type of Funding	***Base Funding***

- Its use of naloxone is entirely at its own risk. There is no representation, warranty, condition or other promise of any kind, express, implied, statutory or otherwise, given by her Majesty the Queen in Right of Ontario as represented by the Ministry of Health, including Ontario Government Pharmaceutical and Medical Supply Service in connection with naloxone.
- The Province takes no responsibility for any unauthorized use of naloxone by the Board of Health or by its clients.
- The Board of Health also agrees to:
    - Not assign or subcontract the distribution, supply or obligation to comply with any of these terms and conditions to any other person or organization without the prior written consent of the Province.
    - Comply with the terms and conditions as it relates to the use and administration of naloxone as specified in all applicable federal and provincial laws.
    - Provide training to persons who will be administering naloxone. The training shall consist of the following: opioid overdose prevention; signs and symptoms of an opioid overdose; and, the necessary steps to respond to an opioid overdose, including the proper and effective administration of naloxone.
    - Follow all provincial written instructions relating to the proper use, administration, training and/or distribution of naloxone.
    - Immediately return any naloxone in its custody or control at the written request of the Province at the Board of Health's own cost or expense, and that the Province does not guarantee supply of naloxone, nor that naloxone will be provided to the Board of Health in a timely manner.

<u>Opioid Overdose Early Warning and Surveillance</u>

Base funding must be used to support the Board of Health in taking a leadership role in establishing systems to identify and track the risks posed by illicit opioids in their jurisdictions, including the sudden availability of illicit synthetic opioids and resulting opioid overdoses. Risk based information about illicit synthetic opioids should be shared in an ongoing manner with community partners to inform their situational awareness and service planning. This includes:

- Surveillance systems should include a set of "real-time" qualitative and quantitative indicators and complementary information on local illicit synthetic opioid risk. Partners should include, but are not limited to: emergency departments, first responders (police, fire and ambulance) and harm reduction services.
- Early warning systems should include the communication mechanisms and structures required to share information in a timely manner among health system and community

partners, including people who use drugs, about changes in the acute, local risk level, to inform action.

Mandatory Programs: Healthy Smiles Ontario Program

The Healthy Smiles Ontario (HSO) Program provides preventive, routine, and emergency and essential dental treatment for children and youth, from low-income families, who are 17 years of age or under.

In addition to the program requirements under the Ontario Public Health Standards, the Board of Health must ensure that the following requirements are met:

- The Board of Health is responsible for ensuring promotional/marketing activities have a direct and positive impact on meeting the objectives of the HSO Program.
- The Board of Health is reminded that HSO promotional/marketing materials approved by the Province and developed provincially are available for use by the Board of Health in promoting the HSO Program.
- The overarching HSO brand and provincial marketing materials were developed by the Province to promote consistency of messaging, and "look and feel" across the province. When promoting the HSO Program locally, the Board of Health is requested to align local promotional products with the provincial HSO brand. When the Board of Health uses the HSO brand, it is required to liaise with the Ministry of Health's Communications Division to ensure use of the brand aligns with provincial standards.
- The Board of Health is required to bill back relevant programs for services provided to non-HSO clients. All revenues collected under the HSO Program, including revenues collected for the provision of services to non-HSO clients such as Ontario Works adults, Ontario Disability Support Program adults, municipal clients, etc., must be reported as income in financial reports as per Schedule C of the Agreement.
- For the purposes of reporting and monitoring for the HSO Program, the Board of Health must use the following provincial approved systems or mechanisms, or other as specified by the Province.
    - Aggregate screening, enrolment, and utilization data for any given month must be submitted by the 15th of the following month to the ministry in the ministry-issued template titled Dental Clinic Services Monthly Reporting Template.
    - Client-specific clinical data must be recorded in either dental management software (e.g., ClearDent, AbelDent, etc.) or in the template titled HSO Clinic Treatment Workbook that has been issued by the ministry for the purposes of recording such data.
- The Board of Health must enter into Service Level Agreements with any partner organization (e.g., Community Health Centre, Aboriginal Health Access Centre, etc.)

delivering services as part of the HSO Program. The Service Level Agreement must set out clear performance expectations, clearly state funding and reporting requirements between the Board of Health and local partner, and ensure accountability for public funds.

- Any significant change to previously approved HSO business models, including changes to plans, partnerships, or processes, must be approved by the Province before being implemented. Any contract or subcontract entered into by the Board of Health for the purposes of implementing the HSO Program must be conducted according to relevant municipal procurement guidelines.

Mandatory Programs: Nursing Positions

Base funding may be utilized to support Chief Nursing Officer, Infection Prevention and Control, and Social Determinants of Health Nursing positions, as well as other nursing positions at the Board of Health.

The Board of Health shall only employ a Chief Nursing Officer with the following qualifications:

- Registered Nurse in good standing with the College of Nurses of Ontario;
- Baccalaureate degree in nursing;
- Graduate degree in nursing, community health, public health, health promotion, health administration or other relevant equivalent OR be committed to obtaining such qualification within three years of designation;
- Minimum of 10 years nursing experience with progressive leadership responsibilities, including a significant level of experience in public health; and,
- Member of appropriate professional organizations (e.g., Registered Nurses' Association of Ontario, Association of Nursing Directors and Supervisors in Official Health Agencies in Ontario-Public Health Nursing Management, etc.).

The Chief Nursing Officer role must be implemented at a management level within the Board of Health, reporting directly to the Medical Officer of Health or Chief Executive Officer and, in that context, will contribute to organizational effectiveness.

The Board of Health shall only employ an Infection Prevention and Control Nurse with the following qualifications:

- The position is required to have a nursing designation (Registered Nurse, Registered Practical Nurse, or Registered Nurse in the Extended Class); and,
- Certification in Infection Control (CIC), or a commitment to obtaining CIC within three years of beginning of employment.

Type of Funding	***Base Funding***

The Board of Health shall only employ a Social Determinants of Health Nurse with the following qualifications:

- The position is required to be to be a Registered Nurse; and,
- The position is required to have or be committed to obtaining the qualifications of a public health nurse as specified in section 71(3) of the HPPA and section 6 of Ontario Regulation 566 under the HPPA.

Mandatory Programs: Smoke-Free Ontario

Smoke-Free Ontario is a comprehensive approach that combines programs, policies, social marketing, and legislation to reduce the use of tobacco and vapour products and lower health risks by protecting Ontarians from second-hand smoke and vapour, and to keep harmful products out of the hands of children and youth.

In addition to the program requirements under the Ontario Public Health Standards, the Board of Health must ensure that it complies with any written directions provided by the Province on the interpretation and enforcement of the Smoke-Free Ontario Act, 2017.

Medical Officer of Health / Associate Medical Officer of Health Compensation Initiative (100%)

The Province provides the Board of Health with 100% of the additional base funding required to fund eligible Medical Officer of Health (MOH) and Associate Medical Officer of Health (AMOH) positions within salary ranges initially established as part of the 2008 Physician Services Agreement and continued under subsequent agreements.

Base funding must be used for costs associated with top-up for salaries and benefits, and for applicable stipends, to eligible MOH and AMOH positions at the Board of Health and cannot be used to support other physicians or staffing costs. Base funding for this initiative continues to be separate from cost-shared base salaries and benefits.

The maximum base funding allocation in Schedule A of the Agreement does not necessarily reflect the cash flow that the Board of Health will receive. Cash flow will continue to be adjusted regularly by the Province based on up-to-date application data and information provided by the Board of Health during a funding year. The Board of Health is required to notify the Province if there is any change in the eligible MOH and/or AMOH(s) base salary, benefits, FTE and/or position status as this may impact the eligibility amount for top-up.

The Board of Health must comply and adhere to the eligibility criteria for the MOH/AMOH Compensation Initiative as per the Policy Framework on Medical Officer of Health

Type of Funding	***Base Funding***

Appointments, Reporting, and Compensation, including requirements related to minimum salaries to be eligible for funding under this Initiative.

Ontario Seniors Dental Care Program (100%)

The Ontario Seniors Dental Care Program (OSDCP) provides comprehensive dental care to eligible low-income seniors to help reduce unnecessary trips to the hospital, prevent chronic disease and increase quality of life for seniors. The program is being implemented through a phased approach.

The government announced the launch and staged implementation of the OSDCP on November 20, 2019. During the first stage of implementation, dental services were available for eligible seniors through Boards of Health, participating Community Health Centres and Aboriginal Health Access Centres. Through Stage 1, dental care was initiated and provided to eligible low-income seniors through Boards of Health, participating Community Health Centres, and Aboriginal Health Access Centres based on increasing Board of Health operational funding and leveraging existing infrastructure. The second stage of the program, which began in winter 2020, expanded the program by investing in new dental clinics to provide care to more seniors in need. This included new dental services in underserviced areas, including through mobile dental buses and an increased number of dental suites in Boards of Health, participating Community Health Centres, and Aboriginal Health Access Centres. The second stage of the program will continue throughout 2023-24, with consideration being given to the implementation challenges following the COVID-19 response.

<u>Program Enrolment</u>

Program enrolment is managed centrally and is not a requirement of the Board of Health. The Board of Health is responsible for local oversight of dental service delivery to eligible clients under the program within the Public Health Unit area.

In cases where eligible seniors present with acute pain and urgent need, and are not already enrolled in the program, OSDCP providers, at the clinical discretion of the attending dental care provider, may support timely access to emergency dental treatment by providing immediate services following the seniors' signing of an emergency need and eligibility attestation. This attestation and enrollment process is to be administered at the local level. Following the delivery of emergency treatment, all seniors will need to submit an OSDCP application, be determined eligible, and be enrolled to receive any further non-emergency dental care through the OSDCP.

SCHEDULE B

RELATED PROGRAM POLICIES AND GUIDELINES

Type of Funding	***Base Funding***

Program Delivery

The OSDCP is delivered through Boards of Health, participating Community Health Centres, and Aboriginal Health Access Centres across the province. These service delivery partners are well positioned to understand the needs of priority populations and provide high quality dental care to low-income seniors in their communities.

With respect to Board of Health service delivery under the OSDCP, the Board of Health may enter into partnership contracts with other entities/organizations or providers/specialists as needed (e.g., to address potential access issues) to provide services to enrolled clients in accordance with the OSDCP Schedules of Services for Dentist and Non-Dentist Providers on behalf of the Public Health Unit.

Where OSDCP client service access issues exist, as evidenced by waiting lists, for example, the Board of Health must take prompt action as feasible to establish OSDCP partnership agreements to address these access issues, including engaging in outreach and consultation with local dental providers and in compliance with the Board of Health or municipal procurement processes.

Base funding for the OSDCP must be used in accordance with the OSDCP-related requirements of the Oral Health Protocol, 2018 (or as current), including specified requirements for service delivery, oral health navigation, and data collection and analysis. The Board of Health may allocate base funding for this Program across the program expense categories, with every effort made to maximize clinical service delivery and minimize administrative costs.

Planning for delivery of the OSDCP began when the program was announced in April 2019 with clinical service delivery beginning with the program launch in November 2019.

As part of implementation, eligible expense categories under this Program also include:

- *Clinical service delivery costs*, which are comprised of:
    - Salaries, wages, and benefits of full-time, part-time, or contracted staff of the Board of Health or local service delivery partner which provide clinical dental services for the Program.
    - Salaries, wages, and benefits of full-time, part-time, or contracted staff of the Board of Health or local service delivery partner which undertake ancillary/support activities for the Program, including: management of the clinic(s); financial and programmatic data collection and reporting for the clinic(s); and, general administration (e.g., reception services) at the clinic(s).

Type of Funding	***Base Funding***

- Overhead costs associated with the Program's clinical service delivery such as: clinical materials and supplies; building occupancy costs; maintenance of clinic infrastructure; staff travel associated with clinical service delivery (e.g., portable clinics, mobile clinics, long-term care homes, if applicable); staff training and professional development associated with clinical staff and ancillary/support staff, if applicable; office equipment, communication, and information and information technology.

- *Oral health navigation costs*, which are comprised of:
  - Salaries, wages, and benefits of full-time, part-time, or contracted staff engaged in: client enrolment assistance for the Program's clients (i.e., assisting clients with enrolment forms); program outreach (i.e., local-level efforts for identifying potential clients); and, oral health education and promotion to the Program's clients.
  - Salaries, wages, and benefits of full-time, part-time, or contracted staff that undertake the following ancillary/support activities related to oral health navigation: management, financial and programmatic reporting, and general administration (if applicable).
  - Overhead costs associated with oral health navigation such as: materials and supplies; building occupancy costs incurred for components of oral health navigation; staff travel associated with oral health navigation, where applicable; staff training and professional development associated with oral health navigation and ancillary/support staff, if applicable; office equipment, communication, and information and information technology costs associated with oral health navigation.
  - Client transportation costs in order to address accessibility issues and support effective program delivery based on local need, such as where the enrolled OSDCP client would otherwise not be able to access dental services. Boards of Health will be asked to provide information on client transportation expenditures through in-year reporting and should track these expenditures and the number of clients accessing these services accordingly.

Operational expenses that are not eligible under this Program include:

- Staff recruitment incentives;
- Billing incentives; and,
- Costs associated with any activities required under the Ontario Public Health Standards, including the Oral Health Protocol, 2018 (or as current), which are not related to the OSDCP.

SCHEDULE B

RELATED PROGRAM POLICIES AND GUIDELINES

Type of Funding	***Base Funding***

Other Requirements

Marketing

- When promoting the OSDCP locally, the Board of Health is required to align local promotional products with the provincial Program brand and messaging. The Board of Health is required to liaise with the Province to ensure use of the brand aligns with provincial standards.

Revenue

- While priority must be given to clients eligible under this Program, the Board of Health may provide services to non-OSDCP clients using resources under this Program. If this occurs, the Board of Health is required to bill-back relevant programs for services provided to non-OSDCP clients using resources under this Program. All revenues collected under the OSDCP, including revenues collected for the provision of services to non-Program clients such as Ontario Works adults, Ontario Disability Support Program adults, Non-Insured Benefits clients, municipal clients, HSO clients, etc., with resources under this Program must be reported as an offset revenue to the Province. Priority must always be given to clients eligible under this Program. The Board of Health is required to closely monitor and track revenue from bill-back for reporting purposes to the Province.
- A client co-payment is required on new denture services. Co-payment amounts are specified by the Province in Appendix A of the OSDCP Denture Services Factsheet for Providers (Factsheet), which applies to both dentists and denturists. It is the Board of Health's responsibility to collect the client co-payment for the codes outlined in Appendix A of the Factsheet. The Board of Health may determine the best mechanism for collecting co-payments, using existing payment and administration processes at the local level, in collaboration with OSDCP service delivery partners (e.g., Community Health Centre, Aboriginal Health Access Centre), as needed. The remaining cost of the service, after co-payment, is to be absorbed by the Board of Health through its operating base funding for the OSDCP. The revenue received from client co-payments for OSDCP service(s) is to be used to offset OSDCP program expenditures. Co-payment revenues are to be reported as part of the financial reporting requirements to the Province.

Community Partners

- The Board of Health must enter into discussions with all Community Health Centres and Aboriginal Health Access Centres in their catchment area to ascertain the feasibility of a partnership for the purpose of delivering this Program.

SCHEDULE B

RELATED PROGRAM POLICIES AND GUIDELINES

Type of Funding	***Base Funding***

- The Board of Health must enter into Service Level Agreements with any partner organization (e.g., Community Health Centres, Aboriginal Health Access Centres) delivering services under this Program. The Service Level Agreement must set out clear performance expectations, clearly state funding and reporting requirements between the Board of Health and the local partner, and ensure accountability for public funds.
- The Board of Health must ensure that base funding is used to meet the objectives of the Program, with a priority to deliver clinical dental services to clients, while staying within the base funding allocation.

Type of Funding	***One-Time Funding***

Cost-Sharing Mitigation (100%)

One-time cost-sharing mitigation funding must be used to offset the increased costs of municipalities as a result of the cost-sharing change for mandatory programs.

Mandatory Programs: Needle Syringe Program (100%)

One-time funding must be used for extraordinary costs associated with delivering the Needle Syringe Program. Eligible costs include purchase of needles/syringes, associated disposal costs, and other operating costs.

Mandatory Programs: Public Health Inspector Practicum Program (100%)

One-time funding must be used to hire at least one (1) or more Public Health Inspector Practicum position(s). Eligible costs include student salaries, wages and benefits, transportation expenses associated with the practicum position, equipment, and educational expenses.

The Board of Health must comply with the requirements of the Canadian Institute of Public Health Inspectors Board of Certification for field training for a 12-week period; and, ensure the availability of a qualified supervisor/mentor to oversee the practicum student's term.

Mandatory Programs: Smoke-Free Ontario Enforcement Tablet Upgrades (100%)

One-time funding must be used for the purchase of Smoke-Free Ontario Enforcement Tablets to support the Tobacco Inspection System software for mobile units. Eligible costs may include costs for peripheral devices (e.g., car chargers, batteries, mouse, keyboard, mobile printers, etc.) and applicable taxes.

COVID-19: General Program Extraordinary Costs (100%)

One-time funding must be used to offset extraordinary costs associated with preventing, monitoring, detecting, and containing COVID-19 in the province (excluding costs associated with the delivery of the COVID-19 Vaccine Program). Extraordinary costs refer to the costs incurred over and above the Board of Health's existing funding/approved budget for mandatory programs in organized and unorganized areas (where applicable).

Eligible costs include, but are not limited to:

- Staffing – Salaries and benefits, inclusive of overtime for existing or redeployed Board of Health staff (including management staff directly engaged in COVID-19 activities); staff redeployed from associated regional governments; new temporary or casual staff; salaries and benefits associated with overtime worked by indirect staff (e.g., finance, human resources, legal, communications, etc.) and management staff (where local

Type of Funding	***One-Time Funding***

Board of Health policies permit such arrangements) that have not been redeployed directly to COVID-19, but have incurred overtime due to working on COVID-19 related activities.

- Travel and Accommodation – for staff delivering COVID-19 service away from their home office location, or for staff to conduct infectious disease surveillance activities (swab pick-ups and laboratory deliveries).
- Supplies and Equipment – small equipment and consumable supplies (including laboratory testing supplies and personal protective equipment) not already provided by the Province, and information and information technology upgrades related to tracking COVID-19 not already approved by the Province.
- Purchased Services – service level agreements for services/staffing with community providers and/or municipal organizations, professional services, security services, cleaning services, hazardous waste disposal, transportation services including courier services and rental cars, data entry or information technology services for reporting COVID-19 data to the Province (from centres in the community that are not operated by the Board of Health) or increased services required to meet pandemic reporting demands, outside legal services, and additional premises rented by the Board of Health.
- Communications – language interpretation/translation services, media announcements, public and provider awareness, signage, and education materials regarding COVID-19.
- Other Operating – recruitment activities, staff training.

Other requirements of this one-time funding include:

- The Board of Health must ensure that any goods and services acquired with this one-time funding are procured through an open and competitive process that aligns with municipal and provincial procurement directives to the greatest extent possible.
- The Board of Health must enter into a Memorandum of Understanding / Service Level Agreement (or other similar arrangement) with any partner organization delivering services under this program (this includes services provided by a municipality of which a Public Health Unit is a part of). The Memorandum of Understanding / Service Level Agreement must set out clear performance expectations, clearly state funding and reporting requirements between the Board of Health and the local partner, and ensure accountability for the funds (value for money). Funding included as part of a Memorandum of Understanding / Service Level Agreement must NOT exceed those that would have been paid if the transaction was at “arm’s length” (and is subject to provincial audit or assessment). Copies of these agreements must be provided to the Province upon request.

Type of Funding	***One-Time Funding***

The following are examples of non-admissible expenditures:

- Costs associated with delivering other public health programs and services.
- Lost revenues for public health programs and services not considered a direct COVID-19 cost, including lost revenue claimed by another organization and/or third party.
- Any COVID-19 costs directly incurred by other organizations and/or third parties (i.e., long-term care homes, hospitals, municipalities). However, if a Board of Health is entering into an agreement with another organization and/or third party, then those costs would be admissible if a Memorandum of Understanding / Service Level Agreement is in place that sets out clear performance expectations and ensures accountability for the funds, as noted above.
- Sick time and vacation accruals, or banked overtime (funding of these items will be considered only when these amounts are paid).
- Costs that are reimbursable from other sources.
- Costs associated with COVID-19 case and contact management self-isolation sites.
- Costs associated with municipal by-law enforcement.
- Electronic Medical Record systems.

The Board of Health is required to track COVID-19 spending separately and retain records of COVID-19 spending.

COVID-19: Vaccine Program Extraordinary Costs (100%)

One-time funding must be used to offset extraordinary costs associated with organizing and overseeing the COVID-19 immunization campaign within local communities, including the development of local COVID-19 vaccination campaign plans. Extraordinary costs refer to the costs incurred over and above the Board of Health's existing funding/approved budget for mandatory programs in organized and unorganized areas (where applicable).

Eligible costs include, but are not limited to:

- Staffing – salaries and benefits, inclusive of overtime, for existing staff or redeployed Board of Health staff (including management staff directly engaged in COVID-19 activities); staff redeployed from associated regional governments; new temporary or casual staff; and, salaries and benefits associated with overtime worked by indirect staff (e.g., finance, human resources, legal, communications, etc.) and management staff (where local Board of Health policies permit such arrangements) that have not been redeployed directly to COVID-19, but have incurred overtime due to working on COVID-19 related activities. Activities include providing assistance with meeting provincial and local requirements for COVID-19 surveillance and monitoring (including vaccine safety surveillance, adverse events and number of people vaccinated), administering the

Type of Funding	***One-Time Funding***

COVID-19 vaccine, managing COVID-19 Vaccine Program reporting requirements, and planning and deployment of immunization/ vaccine clinics.

- Travel and Accommodation – for staff delivering COVID-19 Vaccine Program services away from their home office location, including transporting vaccines, and transportation/accommodation for staff of mobile vaccine units.
- Supplies and Equipment – supplies and equipment associated with the storage and handling of the COVID-19 vaccines (including vaccine refrigerators, freezers, coolers, etc.), small equipment and consumable supplies (including personal protective equipment) not already provided by the Province, supplies necessary to administer the COVID-19 vaccine (including needles/syringes and disposal, sterile gauze, alcohol, bandages, etc.) not already provided by the Province, information and information technology upgrades related to tracking COVID-19 immunization not already approved by the Province.
- Purchased Services – service level agreements for services/staffing with community providers and/or municipal organizations, professional services, security services, cleaning services, hazardous waste disposal, transportation services (e.g., courier services, transporting clients to vaccination clinics), data entry or information technology services for reporting COVID-19 data related to the Vaccine Program to the Province from centres in the community that are not operated by the Board of Health or increased services required to meet pandemic reporting demands, outside legal services, and additional premises leased or rented by the Board of Health.
- Communications – language interpretation/translation services, media announcements, public and provider awareness, signage, and education materials regarding COVID-19 immunization outreach.
- Other Operating – recruitment activities, staff training.

Other requirements of this one-time funding include:

- The Board of Health must ensure that any goods and services acquired with this one-time funding are procured through an open and competitive process that aligns with municipal and provincial procurement directives to the greatest extent possible.
- The Board of Health must enter into a Memorandum of Understanding / Service Level Agreement (or other similar arrangement) with any partner organization delivering services under this program (this includes services provided by a municipality of which a Public Health Unit is a part of). The Memorandum of Understanding / Service Level Agreement must set out clear performance expectations, clearly state funding and reporting requirements between the Board of Health and the local partner, and ensure accountability for the funds (value for money). Funding included as part of a Memorandum of Understanding / Service Level Agreement must NOT exceed those

that would have been paid if the transaction was at “arm’s length” (and is subject to provincial audit or assessment). Copies of these agreements must be provided to the Province upon request.

The following are examples of non-admissible expenditures:

- Costs associated with delivering other public health programs and services.
- Lost revenues for public health programs and services not considered a direct COVID-19 cost, including lost revenue claimed by another organization and/or third party.
- Any COVID-19 costs directly incurred by other organizations and/or third parties (i.e., long-term care homes, hospitals, municipalities). However, if a Board of Health is entering into an agreement with another organization and/or third party, then those costs would be admissible if a Memorandum of Understanding / Service Level Agreement is in place that sets out clear performance expectations and ensures accountability for the funds, as noted above.
- Sick time and vacation accruals, or banked overtime (funding of these items will be considered only when these amounts are paid).
- Costs that are reimbursable from other sources.

The Board of Health is required to track COVID-19 spending separately and retain records of COVID-19 spending.

COVID-19: Vaccine Program Enhancement (100%)

One-time funding must be used by the board of health to address COVID-19 Vaccine Program operations, including the wind-down of the fall vaccine campaign and preparation for the spring campaign, for the period of January 1, 2024 to March 31, 2024.

Eligible costs align with those outlined as part of the COVID-19 Vaccine Program.

Ontario Seniors Dental Care Program (100%)

One-time funding must be used by the Board of Health to offset extraordinary costs associated with delivering the Ontario Seniors Dental Care Program.

Ontario Seniors Dental Care Program Capital: Public Health Services Seniors Dental Clinic (100%)

As part of the OSDCP, capital funding is being provided to support capital investments in Boards of Health, Community Health Centres and/or Aboriginal Health Access Centres across the province for enhancing infrastructure to increase clinical spaces and capacity to deliver dental care services for eligible seniors.

Type of Funding	***One-Time Funding***

One-time funding must be used to build a two (2) operatory Public Health Services Seniors Dental Clinics with a dedicated instrument reprocessing/sterilization area. The Board of Health will be securing space to accommodate the 2 operatory dental clinics. Eligible costs include the addition of the 2 new dental operatories, an instrument reprocessing and sterilization area, a Pan X-ray room, staff and storage areas, as well as equipment and furniture.

Other requirements of this capital funding include:

- Any changes to the scope of the project, including anticipated timelines, require, prior review and approval by the Province.
- Capital funding is provided with the understanding that no additional operating funding is required, nor will it be made available by the Province, as a result of the completion of this project.
- The Board of Health must ensure that any goods and services acquired with this Capital funding should be procured through an open and competitive process that aligns with municipal and provincial procurement directives to the greatest extent possible.
- The Board of Health must ensure that this project is compliant with associated legislated standards (i.e., Building code/associated Canadian Standards Association requirements) and infection prevention and control practices as appropriate to the programs and services being delivered within the facility.

School-Focused Nurses Initiative (100%)

The School-Focused Nurses Initiative was created to support additional nursing FTE capacity in every Board of Health to provide rapid-response support to school boards and schools, child care, and camps in facilitating public health preventative measures related to the COVID-19, including screening, testing, tracing, vaccination, education and mitigation strategies.

The school-focused nurses contribute to the following activities in support of school boards and schools:

- Providing support in the development and implementation of COVID-19 health and safety plans;
- Providing sector specific support for infection prevention; vaccinations, surveillance, screening and testing; outbreak management; case and contact management; and,
- Supporting communication and engagement with local school communities, as well as the broader health care sector.

While the priority focus is on the COVID-19 response, the additional nurses may also support the fulfilment of Board of Health requirements to improve the health of school-aged children and youth as per the School Health Program Standard and related guidelines and protocols under the Ontario Public Health Standards. The additional FTEs may also support childcare

Type of Funding	***One-Time Funding***

centres, home childcare premises and other priority settings relating to the health of school-aged children and youth.

The initiative is being implemented with the following considerations:

- Recruitment of Registered Nurses to the extent possible;
- French language and Indigenous (First Nation, Métis, Inuit) service needs;
- Capacity for both in-person and virtual delivery;
- Consistency with existing collective agreements; and,
- Leveraging the Chief Nursing Officer role as applicable in implementing this initiative, as well as coordinating with existing school health, nursing, and related programs and structures within the Board of Health (e.g., School Health Teams, Social Determinants of Health Nurses, Infection Prevention and Control Nurses, and school-based programs such as immunization, oral and vision screening, reproductive health, etc.).

Qualifications required for these positions are:

- Current registration with the College of Nurses of Ontario (i.e., Registered Nurse, Registered Practical Nurse, or Registered Nurse in the Extended Class).

One-time funding must be used to continue the new temporary FTEs for school-focused nurses as specified in Schedule A of the Agreement. Funding is for nursing salaries, wages, and benefits only and cannot be used to support other operating costs. Additional costs incurred by the Board of Health to support school re-opening initiatives that cannot be managed within the existing budget of the Board of Health, are admissible through the COVID-19 extraordinary costs process.

Type of Funding ***Other***

Infectious Diseases Programs Reimbursement

Funding for Infectious Diseases Programs will be provided on a case-by-case basis through direct reimbursement. These funds are provided to offset the costs of treatment medications not made available through the Ontario Government Pharmaceutical and Medical Supply Service (OGPMSS).

To be reimbursed, original receipts and client identification information needs to be submitted to the Infectious Diseases Section of the Health Protection and Surveillance Policy and Programs Branch (Office of Chief Medical Officer of Health, Public Health). Clients will not be directly reimbursed.

Questions about the reimbursement process and expense eligibility can be submitted to the following email: IDPP@ontario.ca.

Leprosy

The Board of Health may submit claims on a case-by-case basis for medication costs related to the treatment of Leprosy. As per Chapter A: Leprosy, of the Infectious Diseases Protocol, 2018 (or as current), treatment should be under the direction of an infectious disease specialist and should refer to World Health Organization (WHO) treatment recommendations.

Tuberculosis

The Board of Health may submit claims on a case-by-case basis for second-line and select adjunct medications related to the treatment of active tuberculosis and latent tuberculosis infection. For more information on the reimbursement process, see section 9 of the Tuberculosis Program Guideline, 2018 (or as current).

Vaccine Programs Reimbursement

Funding on a per dose basis will be provided to the Board of Health for the administration of influenza, meningococcal, and human papillomavirus (HPV) vaccines.

In order to claim the vaccine administration fees, the Board of Health is required to submit, as part of the Standards Activity Reports or other reports as requested by the Province, the number of doses administered. Reimbursement by the Province will be made on a quarterly basis based on the information.

The Board of Health is required to ensure that the vaccine information submitted in the Standards Activity Reports, or other reports requested by the Province, accurately reflects the vaccines administered.

Type of Funding	***Other***

Influenza

- The Province will continue to pay $5.00/dose for the administration of the influenza vaccine.
- All doses administered by the Board of Health to individuals aged 6 months or older who live, work or attend school in Ontario.

Meningococcal

- The Province will continue to pay $8.50/dose for the administration of the meningococcal vaccine.
- Routine immunization program: Doses administered as part of the grade 7 school-based or catch-up program for eligible students up to grade 12.
- Men-C-C doses if given in substitution of Men-C-ACYW135 for routine doses.

Note: Doses administered through the high-risk program are not eligible for reimbursement.

Human Papillomavirus (HPV)

- The Province will continue to pay $8.50/dose for the administration of the HPV vaccine.
- Routine immunization program: Doses administered as part of the grade 7 school-based or catch-up program for eligible students up to grade 12.
- High-risk program: MSM <26 years of age.

SCHEDULE C
REPORTING REQUIREMENTS

The reports mentioned in this Schedule are provided for every Board of Health Funding Year unless specified otherwise by the Province.

The Board of Health is required to provide the following reports/information in accordance with direction provided in writing by the Province (and according to templates provided by the Province):

Name of Report	Reporting Period	Due Date
1. Annual Service Plan and Budget Submission	For the entire Board of Health Funding Year	March 1 of the current Board of Health Funding Year
2. Quarterly Standards Activity Reports		
Q2 Standards Activity Report	For Q1 and Q2	July 31 of the current Board of Health Funding Year
Q3 Standards Activity Report	For Q3	October 31 of the current Board of Health Funding Year
Q4 Standards Activity Report	For Q4	January 31 of the following Board of Health Funding Year
3. Annual Report and Attestation	For the entire Board of Health Funding Year	April 30 of the following Board of Health Funding Year
4. Annual Reconciliation Report	For the entire Board of Health Funding Year	April 30 of the following Board of Health Funding Year
5. Infection Prevention and Control Hubs	For the period of April 1, 2023 to March 31, 2024	As directed by the Province
6. MOH / AMOH Compensation Initiative Application	For the entire Board of Health Funding Year	As directed by the Province
7. Other Reports and Submissions	As directed by the Province	As directed by the Province

Definitions

For the purposes of this Schedule, the following words shall have the following meanings:
"Q1" means the period commencing on January 1st and ending on the following March 31st
"Q2" means the period commencing on April 1st and ending on the following June 30th
"Q3" means the period commencing on July 1st and ending on the following September 30th
"Q4" means the period commencing on October 1st and ending on the following December 31st

Report Details

Annual Service Plan and Budget Submission

- The Annual Service Plan and Budget Submission Template sets the context for reporting required of the Board of Health to demonstrate its accountability to the Province.
- When completed by the Board of Health, it will: describe the complete picture of programs and services the Boards of Health will be delivering within the context of the Ontario Public

Health Standards; demonstrate that Board of Health programs and services align with the priorities of its communities, as identified in its population health assessment; demonstrate accountability for planning – ensure the Board of Health is planning to meet all program requirements in accordance with the Ontario Public Health Standards, and ensure there is a link between demonstrated needs and local priorities for program delivery; demonstrate the use of funding per program and service.

Quarterly Standards Activity Reports

- The Quarterly Standards Activity Reports will provide financial forecasts and interim information on program achievements for all programs governed under the Agreement.
- Through these Standards Activity Reports, the Board of Health will have the opportunity to identify risks, emerging issues, changes in local context, and programmatic and financial adjustments in program plans.
- The Quarterly Standards Activity Reports shall be signed on behalf of the Board of Health by an authorized signing officer.

Annual Report and Attestation

- The Annual Report and Attestation will provide a year-end summary report on achievements on all programs governed under the Agreement, in all accountability domains under the Organizational Requirements, and identification of any major changes in planned activities due to local events.
- The Annual Report will include a narrative report on the delivery of programs and services, fiduciary requirements, good governance and management, public health practice, and other issues, year-end report on indicators, and a board of health attestation on required items.
- The Annual Report and Attestation shall be signed on behalf of the Board of Health by an authorized signing officer.

Annual Reconciliation Report

- The Board of Health shall provide to the Province an Annual Reconciliation Report for funding provided for public health programs governed under the Accountability Agreement.
- The Annual Reconciliation Report must contain: Audited Financial Statements; and, Auditor's Attestation Report in the Province's prescribed format.
- The Annual Reconciliation Report shall be signed on behalf of the Board of Health by an authorized signing officer.

COVID-19 Reporting

- The Board of Health shall complete and submit actual and forecasted expenditures associated with COVID-19 extraordinary costs (for both the COVID-19 Vaccine Program and the COVID-19 General Program) through the submission of a COVID-19 Expense Form as part of financial reports to the Province.
- Reports shall be signed on behalf of the Board of Health by an authorized signing officer.

SCHEDULE C
REPORTING REQUIREMENTS

Infection Prevention and Control (IPAC) Hub Reports

- The Board of Health shall provide to the Province quarterly status reports for one-time funding provided for the Infection Prevention and Control (IPAC) Hub in addition to identifying concerns and emerging issues in a timely way and contribute to shared problem solving. Reports will include:
    - Operational targets and progress; and
    - Changes in human resources within the IPAC Hub.

MOH / AMOH Compensation Initiative Application

- The Board of Health shall complete and submit an annual application to participate in this Initiative and be considered for funding.
- Supporting documentation such as employment contracts must be provided by the Board of Health, as requested by the Province.
- Application form templates and eligibility criteria/guidelines shall be provided by the Province.

SCHEDULE D

BOARD OF HEALTH FINANCIAL CONTROLS

Financial controls support the integrity of the Board of Health's financial statements, support the safeguarding of assets, and assist with the prevention and/or detection of significant errors including fraud. Effective financial controls provide reasonable assurance that financial transactions will include the following attributes:

- **Completeness** – all financial records are captured and included in the Board of Health's financial reports;
- **Accuracy** – the correct amounts are posted in the correct accounts;
- **Authorization** – the correct levels of authority (i.e., delegation of authority) are in place to approve payments and corrections including data entry and computer access;
- **Validity** – invoices received and paid are for work performed or products received and the transactions properly recorded;
- **Existence** – assets and liabilities and adequate documentation exists to support the item;
- **Error Handling** – errors are identified and corrected by appropriate individuals;
- **Segregation of Duties** – certain functions are kept separate to support the integrity of transactions and the financial statements; and,
- **Presentation and Disclosure** – timely preparation of financial reports in line with the approved accounting method (e.g., Generally Accepted Accounting Principles (GAAP)).

The Board of Health is required to adhere to the principles of financial controls, as detailed above. The Board of Health is required to have financial controls in place to meet the following objectives:

1. Controls are in place to ensure that financial information is accurately and completely collected, recorded, and reported.

Examples of potential controls to support this objective include, but are not limited to:

- Documented policies and procedures to provide a sense of the organization's direction and address its objectives.
- Define approval limits to authorize appropriate individuals to perform appropriate activities.
- Segregation of duties (e.g., ensure the same person is not responsible for ordering, recording, and paying for purchases).
- An authorized chart of accounts.
- All accounts reconciled on a regular and timely basis.
- Access to accounts is appropriately restricted.
- Regular comparison of budgeted versus actual dollar spending and variance analysis.
- Exception reports and the timeliness to clear transactions.
- Electronic system controls, such as access authorization, valid date range test, dollar value limits, and batch totals, are in place to ensure data integrity.
- Use of a capital asset ledger.
- Delegate appropriate staff with authority to approve journal entries and credits.
- Trial balances including all asset accounts that are prepared and reviewed by supervisors on a monthly basis.

2. Controls are in place to ensure that revenue receipts are collected and recorded on a timely basis.

Examples of potential controls to support this objective include, but are not limited to:

- Independent review of an aging accounts receivable report to ensure timely clearance of accounts receivable balances.
- Separate accounts receivable function from the cash receipts function.
- Accounts receivable sub-ledger is reconciled to the general ledger control account on a regular and timely basis.
- Original source documents are maintained and secured to support all receipts and expenditures.

3. Controls are in place to ensure that goods and services procurement, payroll and employee expenses are processed correctly and in accordance with applicable policies and directives.

Examples of potential controls to support this objective include, but are not limited to:

- Policies are implemented to govern procurement of goods and services and expense reimbursement for employees and board members.
- Use appropriate procurement method to acquire goods and services in accordance with applicable policies and directives.
- Segregation of duties is used to apply the three (3) way matching process (i.e., matching 1) purchase orders, with 2) packing slips, and with 3) invoices).
- Separate roles for setting up a vendor, approving payment, and receiving goods.
- Separate roles for approving purchases and approving payment for purchases.
- Processes in place to take advantage of offered discounts.
- Monitoring of breaking down large dollar purchases into smaller invoices in an attempt to bypass approval limits.
- Accounts payable sub-ledger is reconciled to the general ledger control account on a regular and timely basis.
- Employee and Board member expenses are approved by appropriate individuals for reimbursement and are supported by itemized receipts.
- Original source documents are maintained and secured to support all receipts and expenditures.
- Regular monitoring to ensure compliance with applicable directives.
- Establish controls to prevent and detect duplicate payments.
- Policies are in place to govern the issue and use of credit cards, such as corporate, purchasing or travel cards, to employees and board members.
- All credit card expenses are supported by original receipts, reviewed and approved by appropriate individuals in a timely manner.
- Separate payroll preparation, disbursement and distribution functions.

4. Controls are in place in the fund disbursement process to prevent and detect errors, omissions or fraud.

Examples of potential controls include, but are not limited to:

- Policy in place to define dollar limit for paying cash versus cheque.
- Cheques are sequentially numbered and access is restricted to those with authorization to issue payments.
- All cancelled or void cheques are accounted for along with explanation for cancellation.
- Process is in place for accruing liabilities.
- Stale-dated cheques are followed up on and cleared on a timely basis.
- Bank statements and cancelled cheques are reviewed on a regular and timely basis by a person other than the person processing the cheques / payments.
- Bank reconciliations occur monthly for all accounts and are independently reviewed by someone other than the person authorized to sign cheques.

From: City of Hamilton <hello@hamilton.ca>
Sent: April 9, 2024 3:57 PM
To: clerk@hamilton.ca
Subject: Webform submission from: Request to Speak to a Committee of Council

Submitted on Tue, 04/09/2024 - 15:57

Submitted by: Anonymous

Submitted values are:

Committee Requested

Committee
Public Health Committee

Will you be delegating in-person or virtually?
In-person

Will you be delegating via a pre-recorded video?
No

Requestor Information

Requestor Information
Kat Lanteigne
BloodWatch.org
2140 A Queen Street East PO Box 51523
Toronto, ON. M4E 3V7
info@bloodwatch.org

Preferred Pronoun
she/her

Reason(s) for delegation request
To support Mayor Horwath's motion to declare the City of Hamilton a "no-paid plasma zone" as non-profit organization that represents tainted blood survivors, patients who use plasma derived medications. Our organization were the vanguards of the Voluntary Blood Donations Act and advise on public blood policy in Canada and internationally. Thank you, kindly, for considering our request.

Will you be requesting funds from the City?
No

Will you be submitting a formal presentation?
Yes

From: City of Hamilton <hello@hamilton.ca>
Sent: April 17, 2024 3:20 PM
To: clerk@hamilton.ca
Subject: Webform submission from: Request to Speak to a Committee of Council

Submitted on Wed, 04/17/2024 - 15:19

Submitted by: Anonymous

Submitted values are:

Committee Requested

Committee
Public Health Committee

Will you be delegating in-person or virtually?
In-person

Will you be delegating via a pre-recorded video?
No

Requestor Information

Requestor Information
Christine Duncan-Wilson
Immunity Canada
[redacted]

Preferred Pronoun
she/her

Reason(s) for delegation request
I will be speaking with regards to the “Paid Plasma” ban that the city is proposing.

Will you be requesting funds from the City?
No

Will you be submitting a formal presentation?
Yes

From: City of Hamilton <hello@hamilton.ca>
Sent: April 22, 2024 7:03 PM
To: clerk@hamilton.ca
Subject: Webform submission from: Request to Speak to a Committee of Council

Submitted on Mon, 04/22/2024 - 19:03

Submitted by: Anonymous

Submitted values are:

Committee Requested

Committee
Public Health Committee

Will you be delegating in-person or virtually?
In-person

Will you be delegating via a pre-recorded video?
No

Requestor Information

Requestor Information
Jennifer van Gennip
Network of Rare Blood Disorder Organizations (NRBDO)
[redacted]
[redacted]
jennifer.vangennip@nrbdo.ca
[redacted]

Preferred Pronoun
she/her

Reason(s) for delegation request
Related to the motion regarding plasma collection in Hamilton.

Will you be requesting funds from the City?
No

Will you be submitting a formal presentation?
No

From: City of Hamilton <hello@hamilton.ca>
Sent: April 23, 2024 12:02 PM
To: clerk@hamilton.ca
Subject: Webform submission from: Request to Speak to a Committee of Council

Submitted on Tue, 04/23/2024 - 12:02

Submitted by: Anonymous

Submitted values are:

Committee Requested

Committee
Public Health Committee

Will you be delegating in-person or virtually?
In-person

Will you be delegating via a pre-recorded video?
No

Requestor Information

Requestor Information
Anthony Marco
Hamilton and District Labour Council
[redacted]

Reason(s) for delegation request
Regarding the Notice of Motion to make Hamilton and Paid-Plasma-Free Zone. (Note: it may be someone else from the Council reading out a statement on behalf of the Hamilton and Distrrict Labour Council.)

Will you be requesting funds from the City?
No

Will you be submitting a formal presentation?
No

From: City of Hamilton <hello@hamilton.ca>
Sent: April 23, 2024 12:29 PM
To: clerk@hamilton.ca
Subject: Webform submission from: Request to Speak to a Committee of Council

Submitted on Tue, 04/23/2024 - 12:29

Submitted by: Anonymous

Submitted values are:

Committee Requested

Committee
Public Health Committee

Will you be delegating in-person or virtually?
Virtually

Will you be delegating via a pre-recorded video?
No

Requestor Information

Requestor Information
Stewart Klazinga
ACORN Hamilton
[redacted]

Preferred Pronoun
he/him

Reason(s) for delegation request
To speak to the Public Health Committee meeting on April 29th regarding the 2024 heat strategy.

Will you be requesting funds from the City?
No

Will you be submitting a formal presentation?
No

Key facts about organ and tissue donation

In March 2023 I received a second chance at life, a gift of life. I received a life saving liver and kidney transplant.
I am passionate about the importance of spreading awareness about the importance of organ and tissue donation.

One organ donor can save up 8 lives

Tissue donation can transform the lives of 75 people

Every 3 days someone dies waiting for a life saving saving transplant

95 percent of Ontarians support organ donation but only 35 percent are registered

Hamilton ranks 139 out of 170 communities for registered donors
Of the 475,275 health card holders only 179,224 are registered which means only 38 percent of people are registered

Everyone has the potential to be a donor

Registration is easy. All you need is a health card and 2 minutes. You can register on line at beadonr.ca or in person at Service Ontario

You must share your wishes with your family so they can support and honour your wishes

Transplants work, they save lives!

I would like to opportunity to educate all City of Hamilton staff members as well as the members of the community on the importance of organ and tissue donation.

Kathleen Zavarise
Ambassador (Trillium Gift of Life)

Hamilton

INFORMATION REPORT

TO:	Mayor and Members Public Health Committee
COMMITTEE DATE:	April 29, 2024
SUBJECT/REPORT NO:	Third-Party Air Monitoring for Green for Life Stoney Creek Landfill (BOH24008) (Wards 5 and 9) **(Outstanding Business List Item)**
WARD(S) AFFECTED:	Wards 5 and 9
PREPARED BY:	Matthew Lawson (905) 545-2424 Ext. 5823 Manal Chaudhry (905) 546-2424 Ext. 7134
SUBMITTED BY: **SIGNATURE:**	Kevin McDonald Director, Healthy Environments Division Public Health Services

COUNCIL DIRECTION

At its meeting on September 27, 2024 Council approved the following motion:

> "That staff be directed to explore the ways and means to provide independent third-party air monitoring for a minimum seven-day period at GFL Stoney Creek Landfill to be funded by the Stoney Creek Compensation Royalties (GFL Landfill) Reserve 117036 and report back to the Public Health Committee."

This information report satisfies the requirement for Item 2023-I, respecting Independent Third Party Air Monitoring at GFL Stoney Creek Landfill, and can be removed from the Public Health Committee Outstanding Business List.

INFORMATION

The purpose of this report is a response to Board of Health's direction to explore third-party air monitoring in close proximity to the Green For Life Stoney Creek Landfill located at 65 Green Mountain Road, Stoney Creek. AtkinsRéalis was identified through the City's Roster Program as a vendor that can support the development of a feasibility report with options for air monitoring at Green For Life Stoney Creek Landfill (the Site).

Background

In response to residents' odour complaints and concerns regarding potential contaminants and impacts from odour, the Ontario Ministry of Environment, Conservation, and Parks (the Ministry) conducted two air monitoring assessments in August and September 2023.

The Ministry assessments included monitoring of the following compounds: benzene, trichloroethylene, toluene, tetrachloroethylene, chlorobenzene, ethylbenzene, styrene, 1,2,4 trimethylbenzene, naphthalene, nitrogen oxides (NOx), including nitric oxide (NO) and nitrogen dioxide (NO_2), total reduced sulfur compounds (TRS) and sulfur dioxide (SO_2), as well as odour measurements through a nasal ranger. The Ministry assessments found several instances of elevated odours, and twenty-nine (29) 10-minute Total Reduced Sulphur O. Reg. 419/05 Standard exceedances at various locations around the Green For Life Site in September 2023. The Ministry has identified the Green For Life Site and leachate pond as the most likely source of odour and recorded Total Reduced Sulphur exceedances. The Ministry's air monitoring assessments assumed that Total Reduced Sulphur measured around the Green For Life Site is composed of hydrogen sulphide (H_2S).

As a result of the exceedances of Total Reduced Sulphur and the continued odour from the site, the Ministry issued a Provincial Officer's Order to Green For Life on October 17, 2023. Under the Order, Green For Life is mandated to retain the services of a qualified third-party to submit an air monitoring plan for the Stoney Creek Landfill to the Ministry for approval. This plan should monitor Total Reduced Sulphur, ammonia, and other contaminants that may contribute to odours at the Site.

Although hydrogen sulfide (H_2S) has not been known to cause cancer,[1] prolonged exposure to low concentrations of Total Reduced Sulphur compounds such as hydrogen sulfide (H_2S) may cause headaches, tiredness, and nausea.[1] This is consistent with community concerns raised regarding their lived experience with the

[1] Canadian Centre for Occupational Health and Safety (CCOHS), 2023. Hydrogen Sulfide. Available from: https://www.ccohs.ca/oshanswers/chemicals/chem_profiles/hydrogen_sulfide.html

odour emanating from the Facility impacting their quality of life [2, 3, 4, 5] which research confirms can trigger an individual's stress response.[6]

As a part of the City's efforts to address public concerns regarding air quality and odours, Hamilton City Council directed Public Health Services to explore options to provide independent third-party air monitoring in close proximity to the Green For Life Site for a minimum of seven days.

Sampling Plans Provided in Feasibility Report

AtkinsRéalis submitted a feasibility report to the City outlining three sampling plans for third-party air monitoring in close proximity to the Green For Life Stoney Creek Landfill (see Appendix "A" to Public Health Committee Report BOH24008). The sampling plans, a brief description, and the associated costs are provided in Table 1 below.

[2] Aatamila M., Verkasalo P. K., Korhonen M. J., Suominen A. L., Hirvonen M. R., Viluksela M. K., et al. 2011 Odour annoyance and physical symptoms among residents living near waste treatment centres Environ Res 111 1 164 -170 Available from: https://pubmed.ncbi.nlm.nih.gov/21130986/

[3] Baldacci S., Maio S., Martini F., Silvi P., Sarno G., Cerrai S., et al. 2015 Odor annoyance perception and health effects in an Italian general population sample Eur Respir J PA1115 Available from: https://erj.ersjournals.com/content/46/suppl_59/PA1115

[4] Blanes-Vidal V. 2015 Air pollution from biodegradable wastes and non-specific health symptoms among residents: Direct or annoyance-mediated associations? Chemosphere 120 371 -377 Available from: https://pubmed.ncbi.nlm.nih.gov/25192839/

[5] Hooiveld M., van Dijk C. E., van der Sman-De Beer F., Smit L. A. M., Vogelaar M., Wouters I. M., et al. 2015 Odour annoyance in the neighbourhood of livestock farming – Perceived health and health care seeking behaviour Ann Agric Environ Med 22 1 55 -61 Available from: https://pubmed.ncbi.nlm.nih.gov/25780829/

[6] Hirasawa Y., Shirasu M., Okamoto M., and Touhara K. 2019 Subjective unpleasantness of malodors induces a stress response Psychoneuroendocrinology 106 206 -215 Available from: https://www.sciencedirect.com/science/article/abs/pii/S0306453018312125

Table 1: Sampling Plans Proposed in AtkinsRéalis Feasibility Report

Sampling Plan	Description	Contaminants Sampled	Number of Sampling Locations	Estimated Cost (including laboratory, equipment, staff)
Mobile Continuous Sampling	Mobile analysis vehicle or trailer that is deployed with continuous sampling equipment	Sulphur compounds and Volatile Organic Compounds	Not Applicable	>$1 million
Long-term Fixed Location Passive Sampling	Non-continuous air monitoring through tube/cartridge analysis in fixed positions for a period of seven to fourteen days.	Hydrogen Sulphide and Volatile Organic Compounds	Ten fixed locations over seven to 14 days.	Roughly $20,000
Short-term Fixed Location Canister Sampling	Non-continuous air monitoring through canisters set in fixed locations, which can sample up to eight hours or 24-hours for a period of seven days. Supplemented by 10-minute sampling cannisters.	Sulphur compounds and Volatile Organic Compounds	Five fixed locations per day for 8-hour or 24-hour analysis. Four portable cannisters per day for 10-minute samples.	Roughly $62,000 for a 7-day campaign

The results of the seven-day monitoring would be shared with the Ministry for consideration and appropriate action, if any.

- **Mobile Continuous Sampling;**
  The proposed mobile continuous sampling plan would require the construction and outfitting of a mobile-based laboratory with various continuous samplers, with a power source to support the sampling equipment. This would result in a mobile sampling unit similar to the one operated by and used by the Ministry for air monitoring assessments.

  This option is cost-prohibitive as well as time consuming, as sourcing the

equipment and building the unit will take upwards of six months. This would not allow for any sampling to occur in the warmer months of 2024 when odours may be exacerbated.

It should be noted that if Public Health Services were to invest in a mobile air monitoring unit, the unit should be procured directly and owned by the City of Hamilton as opposed to a third-party. A business case for a mobile air monitoring unit would have to be further explored to determine the value of the unit.

- **Long-term Fixed Location Passive Sampling;**
  The proposed long-term passive sampling involves using air sampling equipment (a tube or cartridge with an open inlet) at a fixed location over the sampling period. The equipment proposed by AtkinsRéalis is capable of sampling for hydrogen sulphide (H_2S) and Volatile Organic Compounds. Samples are analysed by a laboratory at the end of the sampling period and the laboratory returns an average concentration. The sampling sites will be based on predominant wind directions and residential locations.

  The concentrations of hydrogen sulphide (H2S) and Volatile Organic Compounds returned through this sampling method are an average over the entire sampling period of seven to fourteen days. As such, this method does not capture any short-term peaks in contaminant concentrations. However, the Ministry air monitoring assessment conducted in September 2023 shows that exceedances of Total Reduced Sulphur around the Green For Life Site were short-term in nature. In addition, the passive sampling equipment is capable of measuring hydrogen sulphide, but not Total Reduced Sulphur. Therefore, this sampling method will not provide an indication of exceedances of Total Reduced Sulphur levels near the Green For Life Site.

  This sampling plan may be better suited to determine long-term exposures to contaminants. However, the results from this sampling plan are not directly comparable to Ontario's health based Ambient Air Quality Criteria, as the averaging period in the criteria are 10-minutes, 8-hour, 24-hour, 30-day, and annual.

- **Short-term Fixed Location Canister Sampling;**
  The proposed short-term fixed location canister sampling plan uses canisters that are set up at fixed locations for a short period during which the air is drawn into the sampler. The sampling plan proposes four locations for 8-hour sampling periods. AtkinsRéalis has indicated that this sampling period can be extended to 24-hours, and that the laboratory is also able to provide Total Reduced Sulphur concentrations from the sample which can then be compared to the 24-hour health-based Ambient Air Quality Criteria for Total Reduced Sulphur. Similar to

the long-term sampling plan, the sampling equipment will be sited based on wind directions and the location of residential neighbourhoods.

This sampling plan also includes additional portable samples that can take 10-minute samples to compare to the odour based Ambient Air Quality Criteria for Total Reduced Sulphur. The locations of the 10-minute samplers can be determined based on odour observations by third-party staff or based on residential complaints. While results from this sampling plan can be compared to the 10-minute and 24-hour Ontario Ambient Air Quality Criteria, the sampling methodology is not approved by the Ministry.

Both the long-term and short-term monitoring plan require a minimum of two weeks for preparation, and results from the laboratory may take up to 10 days or more for turn-around time. This timeline may be further prolonged if sampling equipment is not available at the laboratory. In addition, unmanned stations can be tampered with.

- **Ministry Order to Green For Life for Independent Third-Party Air Monitoring**
  The Ministry's September 2023 air monitoring assessment at Green For Life Stoney Creek Landfill found twenty-nine (29) exceedances of Total Reduced Sulphur in the community surrounding the Site. Following this assessment, the Ministry issued an order to Green For Life on October 17, 2023 (see Appendix "B" to Public Health Committee Report BOH24008). Part of this order includes Green For Life hiring an independent third-party to submit an air monitoring plan for Total Reduced Sulphur, ammonia, and any other odour causing contaminants on the Site. The order is included as an appendix to this report.

  This monitoring plan will include daily fence-line monitoring for Total Reduced Sulphur and ammonia at the Green For Life site, with sufficient data to compare to the on-site 10-minute and 24-hour standards set out in O.Reg 419/05. The plan must also include odour monitoring in the surrounding community and a plan to communicate monitoring results to the public. Once the monitoring plan is approved by the Ministry and monitoring is underway at the Site, both short-term and long-term Total Reduced Sulphur concentrations will be monitored at the Site.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report BOH24008:	Feasibility Assessment for Odour Monitoring at Green For Life Landfill for City of Hamilton
Appendix “B” to Report BOH24008:	Provincial Officer’s Order Issued to Green For Life Environmental Inc.

FEASIBILITY REVIEW TECHNICAL DOCUMENT

TO: Matthew Lawson (City of Hamilton)

Feasibility Assessment for Odour Monitoring at GFL Landfill for City of Hamilton

C.C.
Rob Conley, Roster Captain (City of Hamilton), Paul Mulholland (City of Hamilton), Darren Dickson (AtkinsRéalis), Jenny Vieira (AtkinsRéalis)

DATE
April 11, 2024

FROM
Chris Bestfather (AtkinsRéalis), Yamara Moya (AtkinsRéalis), Nicholas Hakala (AtkinsRéalis)

REF.
699580

SUBJECT
Feasibility Review Technical Document

1. Notice to Reader

This report has been prepared and the work referred to in this report has been undertaken by AtkinsRéalis Canada Inc. (AtkinsRéalis) for the exclusive use of the City of Hamilton (the Client), who has been party to the development of the scope of work and understands its limitations. The methodology, findings, conclusions, and recommendations in this report are based solely upon the scope of work and subject to the time and budgetary considerations described in the proposal and/or contract pursuant to which this report was issued. Any use, reliance on, or decision made by a third party based on this report is the sole responsibility of such third party. AtkinsRéalis accepts no liability or responsibility for any damages that may be suffered or incurred by any third party because of the use of, reliance on, or any decision made based on this report.

The findings, conclusions, and recommendations in this report (i) have been developed in a manner consistent with the level of skill normally exercised by professionals currently practicing under similar conditions in the area, and (ii) reflect AtkinsRéalis best judgment based on information available at the time of preparation of this report. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our original contract and included in this report. The findings and conclusions contained in this report are valid only as of the date of this report and may be based, in part, upon information provided by others. If any of the information is inaccurate, new information is discovered, site conditions change, or applicable standards are amended, modifications to this report may be necessary.

This report must be read as a whole, as sections taken out of context may be misleading. If discrepancies occur between the preliminary (draft) and final versions of this report, it is the final version that takes precedence. Nothing in this report is intended to constitute or provide a legal opinion.

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2. Introduction

AtkinsRéalis is pleased to provide this technical memorandum to the City of Hamilton (the “City”) describing alternate options and costs to complete air monitoring at the Green for Life (GFL) Environmental Inc. Landfill in Stoney Creek as per our Proposed Feasibility Assessment for Odour Monitoring at GFL Landfill (December 8, 2023).

Developing this memo falls under the existing City of Hamilton’s Contract C12 13 21 for provision of Professional and Consultant Services under the 2022-2024 Roster for Category 08, Solid Waste Management. The City has requested an evaluation of different options for air quality monitoring in proximity to GFL’s contaminated soil landfill in Stoney Creek. The evaluation includes a summary of the advantages and disadvantages of the different methods and provides approximate budgets to complete each of the items. The recommendations of the review can be taken to the City’s Committee or Council for review and approval for implementation beginning in the spring of 2024.

3. Background

Following submission of several public resident complaints regarding air quality and odour issues in the neighbourhoods surrounding the GFL Stoney Creek contaminated soil landfill, the Ministry of the Environment, Conservation and Parks (MECP) completed two rounds of air quality monitoring, for discontinuous periods of 9 and 6 days, in the summer and fall of 2023. Land use parcels around GFL Stoney Creek area are shown in Appendix A in Figure 1 (obtained from MECP report). Their findings were inconclusive, with limited numbers of compounds identified that could have health related impacts, although sulphur-based compounds were identified during the second monitoring event. Following ongoing concerns identified by neighbourhood associations, Hamilton Public Health Services (HPHS) were directed by Hamilton Council to “... explore the ways and means to provide independent third-party air monitoring for a minimum seven-day period at GFL Stoney Creek Landfill... “

3.1 Summary of MECP 2023 Sampling

In 2023 the MECP conducted two air monitoring assessments in August (August 8, 9, 10, 16, 17, 21, 24, 25, and 28) and September (September 1, 14, 15, 22, 28, 29) to quantify ground level concentrations of various harmful pollutants and to quantify odour levels surrounding the GFL site and in the impacted neighbourhoods. Numerous measurement sites both upstream and downstream of the facility were selected for monitoring during these periods based on wind metrics for the area. Wind data was collected from the on-site meteorological tower STN29247 during the sampling periods.

These surveys were conducted utilizing the MECP’s mobile air monitoring vehicle equipped with a portable Gas Chromatograph/Mass Spectrometer (GC/MS) unit for the measurement of volatile organic compounds (VOC), also known as the HAPSITE ER Chemical Identification System. The HAPSITE is a discrete sampling system that draws a known volume of air into the GC/MS over two minutes, followed by a 10-minute analysis. Once the analysis is complete, another sample is taken. The HAPSITE was calibrated to quantify the presence and concentrations of the following VOCs: Benzene, Trichloroethylene, Toluene, Tetrachloroethylene, Chlorobenzene, Ethylbenzene, Styrene, 1,2,4-trimethylbenzene, and Naphthalene.

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Other compounds that were measured during the air monitoring surveys in September and August include: Nitrogen Oxides [NOx includes nitric oxide (NO) and nitrogen dioxide (NO_2)], hydrogen sulphide (H_2S), total reduced sulphur compounds (TRS), fine particulates ($PM_{2.5}$ and PM_{10}), and sulphur dioxide (SO_2) which were measured continuously with individual analysers during each of the air monitoring events, however due to power constraints not all of these were measured continuously, with priority given to SO_2 and TRS.

A St. Croix Sensory Nasal Ranger was used to quantify odour strength in the ambient air. All measurements were reported in Dilution-to-Threshold (D/T), which is a measurement of the number of dilutions needed to make the odourous ambient air “not-detectable” with D/T measurements ranging from <2 to 60. Results with a D/T <2 mean an odour was detected by the technician without equipment but was not quantifiable by the nasal ranger. Staff using this equipment were trained before the start of the odour assessment.

The following conclusions are summarized from each study:

August 8-25 Campaign:

Detected odours in the September campaign were described as garbage, leachate, musty, natural gas, sweet, sour, wet diaper, and urine. Odours were noted on 5 days; however, they were only quantifiable with the nasal ranger on August 28 (7 < D/T < 15). See Figure 10 from MECP report in Appendix A. The leachate pond and facility were identified as likely sources. VOC’s and respective H_2S and TRS concentrations measured in ambient air at the receptor points were found to be below their respective MECP limits while the odours were detected.

September 1-29 Campaign:

Odours identified each day were described as raw sulphur, leachate, herb, garbage, solvent chemical, burnt, rotten eggs and odour masking agents. The Nasal Ranger identified dilution ratios as high as D/T <15. See Figure 5 in Appendix A from the MECP report. Over the course of all sampling days, the survey suggests that the leachate pond and the GFL facility are likely the sources of the identified odours. VOC concentrations measured in the ambient air at the odour receptor points were found to be below their respective MECP limits while the odours were detected.

Measured 10-minute TRS exceedances were noted around the GFL facility and within residential areas with the highest 10-minute TRS concentrations measured immediately west of the leachate pond. See Figure 12 in Appendix A from MECP report. As measurements were not conducted over 24-hours it is possible that short-term peaks above the 10-minute limits is a common occurrence outside of the monitoring periods. The MECP report recommends evaluation using continuous 24-hour TRS monitoring to compare with the 24-hour TRS standard for health effects.

As discussed during scoping meetings between AtkinsRéalis and HPHS, exactly replicating the MECP methodology (as per *Operations Manual for Air Quality Monitoring in Ontario*) and recommended 24-hour monitoring for TRS would be expected to be inordinately expensive as it would require construction of a mobile monitoring unit equipped with multiple continuous monitoring devices. Also, exactly replicating MECP methodology may not be required to determine whether there are potential health related impacts, particularly if the suite of parameters being reviewed is narrowed. As such on Monday, December 4, 2023, Hamilton’s Public Health Committee approved the following recommendation: That Public Health Services Staff be directed to work with AtkinsRéalis to develop a feasibility study with options to perform air monitoring for a minimum seven-day period at the Green for Life Environmental Inc. Landfill, Stoney Creek…and report back to the Public Health Committee in Q1, 2024.

4. Sampling Plan Development

The sampling plans presented herein were developed with a focus on odour health limits (e.g., H_2S, TRS) and the impacts at the sensitive receivers (i.e., the residential areas located to the north and south of the GFL facility). These plans assume the MECP sampling reports accurately identify the odour sources as the GFL landfill and leachate pond and that their reported results are representative for screening in appropriate potential odour related compounds. The purpose of each of the air quality assessment plans is to provide options that could monitor concentrations in the vicinity of the landfill for selected hazardous contaminants that will allow an assessment of whether potential impacts to neighbouring properties represent a health risk or only an odour nuisance.

4.1 General Principles

Given the previously stated focus and assumptions, the sampling plan scope includes the following:

- Identify sources and most impacted receptors based on meteorology.
- Quantify measured concentrations for selected parameters at the sensitive receptor (ground) level.
- Assess health impacts with MECP limits.
- Justify and inform locations for future monitoring and which pollutants are of interest.

Listed studies should be scheduled seasonally, to reflect changing conditions, and are recommended to be initiated after ground thawing has occurred. The different ambient temperatures, wind patterns and receptor usage will be reflected by completing multiple seasonal sampling events and this will prevent conclusions from being drawn from the conditions encountered during a single event. Some thought should also be given to different times of day as to when maximum exposures are likely, such as coming home from school or work.

Sampling locations will be planned based on the results of the 2023 MECP monitoring campaigns and local meteorological station data to quantify upstream and downstream effects from the landfill and its operations. Air quality monitoring locations can also be situated based on field staff olfactory observations. Sampling durations shall be determined based on the program/technology selected and the applicable limits and averaging periods.

Listed programs shall be selected based on the pollutants of concern related to odours, and health concerns, and will be compared to their regulatory limits.

4.2 Sampling Plans

Each Sampling plan in this section will be compared based on the following criteria:

1. Preparation and quantity.
2. Sampling Method, including media and lab analysis.
3. Contaminants of Concern and detection limits.
4. Labour Requirements.
5. Timing and Frequency of the campaign.

Example pictures of sampling equipment and field set-up are provided in Appendix C.

4.2.1 Mobile Continuous Sampling

Mobile continuous sampling similar to the MECP monitoring was recommended which would apply the requirements in the *Operations Manual for Air Quality Monitoring in Ontario*.

Parameter	Comment
Sample Method	Continuous similar to HAPSITE using GC/MS
Number of Samples	Daily with discrete sampling frequency and analysis within 15-min intervals
Contaminants of Concern	VOCs and Sulphur
Frequency and Duration	Daily as required
Results	Available same day

1. Preparation requirements include the construction and outfitting of a mobile-based laboratory with various continuous samplers. This equipment may be installed inside a vehicle itself or a trailer to allow for relocation of sampling points upwind and downwind of the source. A power source is required to support the sampling equipment.
2. The analysis vehicle may intake continuous samples of air and conduct analysis utilizing the suite of analysis equipment onboard. Significant calibration and quality assurance would be required to satisfy all requirements of the MECP operations manual.
3. Analysis capability for this purpose would include those compounds identified as detectable in the MECP studies: VOCs and odourous compounds (H_2S, TRS, etc.). detection limits and sampling periods for the contaminants of concern depend on the health-based limits (e.g., 10-minute, and 24-hour).
4. Operation of the mobile lab and maintenance of the equipment onboard requires dedicated technicians and operators that understand how to troubleshoot and interpret results. Correct operation and analysis require expert users.
5. The mobility of the lab allows for sampling in numerous different settings provided the vehicle can access the area. Provided there is time for calibration of the equipment and sufficient resources available sampling can be done quickly and respond to specific complaints.

4.2.2 Short-Term Fixed Location Canister Sampling

Short-term sampling with vacuum canisters is employed to characterize the air quality in a fixed location over periods of less than 24-hours. Samples are analysed by laboratory and provide an average concentration for several parameters.

Parameter	Value	Comments
Sample Method	Evacuated Canister with flow controller on inlet and tripod to elevate sample (~1.5 m above ground).	Initial pressure -29 in of Hg Final pressure -5 to -10 in of Hg
Number of Samples	4 fixed locations/day Sulphur analysis*	6L canister 8-hour sample Analysis Method ASTM D5504 (S630)
	1 fixed location/day VOC analysis*	6L canister 8-hour sample Analysis Method EPA TO-15 (S621B)
	4 portable samples deployed per day (Location to be determined based on odour observations or residential complaints) Sulphur analysis*	1.4L canisters for 10-min samples Analysis Method ASTM D5504 (S630)
Frequency and Duration	Daily for period of 7-days Total of 70 canister samples (includes 7 duplicates)	To capture daily variation in air quality. Can be repeated monthly or quarterly.
Results	Available within 10 business days (standard turnaround time)	Quicker turn-around times are available at additional costs.

**See list of sulphurous compounds and VOCs in Appendix B. Analysis is a sample GC scan for these compounds (not all may be detected).*

1. Preparation for this sampling methodology requires several laboratory supplied air sampling canisters which are in the selected sampling locations. Planning is required to identify the periods of time and locations likely to measure the most significant air quality impacts. The proposed sampling plan includes up to 5 fixed locations, 4 portable canisters (varied locations) with samples repeated over a period of 7 continuous days (e.g., Monday to Sunday).
2. Air samples are drawn into the canisters and sent for laboratory analysis. The recommended sampling periods for VOCs and odourous compounds in questions are non-continuous samples taken over periods of 8-hour as well as 10-minute; canisters would be picked up and distributed each day by air technicians.
3. Contaminants are screened by the laboratory and detection limits depend on the sample quality (See Appendix B).
4. Minimal training is required to setup each device and results interpretation is completed by a third party.
5. As these are non-continuous samples, the results present an average concentration over the sampling period, as such peaks in contaminant concentrations are not reported. However, 10-minute samples collected during the day (total of 20) are included to capture peaks (to be deployed based on observations in field). Generally, results are available in ten business days following laboratory receipt.

4.2.3 Long-Term Fixed Location Passive Sampling

Long-term sampling with passive sampling media is employed to characterize the air quality in a fixed location over periods of multiple days. Samples are analysed by laboratory and provide an average concentration for several parameters.

Parameter	Value	Comment
Sample Method	Adsorbent tube/cartridge with diffusion inlet (remains open for sample period).	Sampling media elevated and attached to pole/fence with weather shelter.
Number of Samples	8 fixed locations H_2S analysis* for period of 1-15 days	Initial siting and installation by tech., unsupervised for sampling period. Analysis Method Radiello 170 (RAD 170) Duplicate samples for QA/QC. Analysis Method EPA TO-17 (S620D)
	2 fixed locations VOC analysis* for a period of 2-14 days	
Frequency and Duration	Multiple days (e.g., 14 days) Total of 15 samples (includes 5 duplicates).	To capture long-term trends in air quality. Can be repeated monthly or quarterly.
Results	Available within 10 business days (standard turnaround time)	Quicker turn-around times are available at additional costs.

**See list of sulphurous compounds and VOCs in Appendix B.*

1. Adsorbent samples are placed in various locations; these are set and forget type of devices that don't require forced air or flow through them to capture samples.
2. Samples are taken in ambient air through diffusion processes in the adsorbent device (24-hours-2 weeks), each device is then collected at the end of the sampling period and dropped off for laboratory analysis.
3. Adsorbent devices are designed to capture specific contaminants and have been recommended to capture the specific contaminants identified. Because these devices utilize diffusion processes to capture pollutants, there is some sensitivity to environmental conditions (temperature) that must be considered.
4. Replacement tube/cartridges are simple to set up and require little time. Minimal Training is required, and results analysis is done by a third party.
5. As these are non-continuous samples only an average concentration over the sampling period would be reported. As such peaks during the sampling period are not reported.

The proposed sampling plans presented above are compared in TABLE 1 based on the quality of information provided, the timeliness, and approximate costs. The costs include basic, factual reporting but do not include extensive interpretation, public consultation, regulator meetings, presentations to committee or council, etc., each of which could be discussed as part of a detailed proposal.

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Table 1: Comparison of Sampling Methods

Sampling Plan	Description	Advantages	Disadvantages	Approximate Costs*
Mobile Continuous Sampling	Mobile analysis vehicle or trailer that is deployed with continuous sampling equipment.	• Accurate and reliable information. • Vehicle or trailer can be relocated to any accessible location. • Provides near instantaneous results. • Can sample multiple locations. • Sampling equipment can be re-purposed for specific pollutants or for monitoring other sources.	• Significant upfront costs and ongoing costs to operate analysis equipment and vehicle. • Ongoing maintenance fees to calibrate and repair analysis equipment. • Requires repeated monitoring and specialized staff to justify costs. • Limited market to sell equipment and recover expenses.	• On the order of >$1M for capital costs for vehicle/trailer, measurement equipment, power supply plus roughly $100,000 for staff and disbursements to operate the mobile detection unit for a period of 6 months.
Short-Term Fixed Location Canister Sampling	Canisters set in fixed sampling positions to characterized air quality. Non-continuous sampling periods for 8-hours and 10-minutes. Locations selected based on prevailing winds and sensitivity of receptors.	• Affordable and can be repeated. • No supporting infrastructure required. • Air samples can be analyzed for numerous pollutants. • No calibration requirements. • Minimal preparation time. • Limited staff time (pick-up and drop off) with staff available to make air quality observations and supervise sampling.	• Fixed monitoring locations (subject to meteorological effects). • Unmanned stations can be tampered with or subject to background source impacts (e.g., traffic) • 8-hour samples provide average concentration during periods (exclude 10 min peaks). • 10-day turn around time on results. • Limited supply on equipment and canister preparation time (2 weeks). • Relatively small sample volumes impact detection limits.	• Roughly $62,000 for 7-day sampling campaign with 70 total samples (costs include laboratory, equipment and staff fees).
Long-Term Fixed Location Passive Sampling	Tube/cartridge analysis in fixed positions for long periods of time to measure long-term exposures. Non-continuous sampling for periods of 1-2 weeks. Locations selected based on prevailing winds and sensitivity of receptors	• Affordable • No supporting infrastructure apart from weather shelter • Monitors in daytime and nighttime conditions. • Minimal preparation time. • No calibration requirements. • Very little day to day staff time required after installation. • Media can be deployed and picked up periodically. • Results can be used to inform preferred locations for additional fixed continuous monitoring stations or future campaigns. • Complimentary to short-term sampling.	• Fixed monitoring locations (subject to meteorological effects) • Unmanned samplers can be tampered with or subject to background source impacts (e.g., traffic). • Average concentrations of air quality during period (excludes peaks). • High values difficult to explain (limited observations). • Results available several days after sampling. • Fixed sampling period. • Relatively small sampling volumes can impact detection limits and reduce analyte screening list. • Atmospheric effects may impact accuracy of measured results (temperature and diffusion rate).	• Roughly $20,000 for sampling campaign with10 total samples (costs include laboratory, equipment and staff fees).

**Approximate costs based on sampling plan assumptions and typical approaches. Detailed cost estimates can be provided based on requirements and schedule.*

4.2.4 Short-Term Ammonia Fixed Location Sampling

In addition to the program described in the preceding sections that focusses on sulphurous compounds, H_2S and VOCs, the Provincial Officer's Order included continuous monitoring of ammonia in the Air monitoring plan (i.e., potential odour source concern). There is a MECP 24-hour limit for ammonia with a health-based limit; however, the MECP didn't include sampling for ammonia during the ambient air monitoring surveys that were completed in the fall of 2023. Short-duration ammonia sampling requires a different methodology and equipment than either; grab samples for immediate and short-duration monitoring for sulphurous compounds and VOCs (SUMMA cannisters) or; the longer-term passive sampling (adsorbent tubes). Short-duration ammonia sampling uses adsorbent tubes coupled with pumps to collect samples (a more detailed methodology can be provided upon request). Ammonia sampling of this nature would be employed to characterize the air quality in a fixed location over the daytime (i.e., 8 to 12 hour) period, with the results adjusted to align with the 24-hour health limit. Samples are analysed by laboratory and provide an average concentration for several parameters.

Parameter	Value	Comment
Sample Method	Adsorbent tube/cartridge with active collection (pump draws air for sample period).	Sampling media elevated and attached to pole/fence with battery powered pump.
Number of Samples	1 fixed location per day Ammonia analysis for period of 8-hours	Initial siting and installation by tech., unsupervised for sampling period. Analysis Method NIOSH 6015 Duplicate samples for QA/QC.
Frequency and Duration	Multiple single day samples. Total of 14 samples (includes 7 duplicates).	To capture short-term trends in air quality. Can be repeated monthly or quarterly.
Results	Available within 10 business days (standard turnaround time)	Quicker turn-around times are available at additional costs.

1. Adsorbent sample tubes are attached to a sampling pump with tubing and located in selected locations. The operation of the pump is checked periodically during the sample period. The proposed sampling plan includes up to 1 fixed location per day, with samples repeated over a period of 7 continuous days (e.g., Monday to Sunday).
2. Samples are taken in ambient air through an active air sampling process in the adsorbent tube (8-hours), each device is then collected at the end of the sampling period and dropped off for laboratory analysis.
3. Adsorbent devices are designed to capture specific contaminants and the NIOSH method is designed to measure ammonia.
4. Replacement tube/cartridges are simple to set up and require little time. Minimal Training is required, and results analysis is done by a third party.
5. As these are non-continuous samples only an average concentration over the sampling period would be reported. As such, peaks during the sampling period are not reported. 8-hour samples would be compared to the MECP 24-hour limit for ammonia.

Short-Term Ammonia Fixed Location Sampling has similar advantages and disadvantages as Long-Term Fixed Location Passive Sampling described in Table 1.

Approximate Costs

Roughly $6,000 for a 7-day sampling campaign with 14 total samples (costs include laboratory and equipment excluding staff fees). Assuming that the ammonia sampling is combined with the Short-Term Fixed Location Canister Sampling, the total costs of the combined cannister and ammonia sampling plan would be approximately $68,000.

5. Limitations

The sampling plans described are based on assumptions and the following limitations are noted.

- Requesting MECP review or comment on the final sampling methodology prior to completing the work is recommended if the data is to be submitted to the MECP (i.e., consultation to deviate from the Operations Manual requirements) for use in enforcement or to supplement their own sampling events.
- The sampling plans are designed with a focus on MECP health-based limits, which differ from odour sampling plans. Odours can be subjective and not all public react similarly; as such they are considered a nuisance which can impede ability to enjoy property.
- It was assumed the parameters not detected in significant quantities in the 2023 MECP monitoring campaigns were not required to be included in the proposed sampling plans (e.g., NOx, $PM_{2.5}$, PM_{10}, and SO_2), although this could be added at additional cost.
- Although planning can anticipate patterns in wind directions and changes in the intensity of odour emissions; the results of fixed location monitoring campaigns are limited to the period and locations monitored (i.e., results may not reflect peak concentrations). Repeated sampling campaigns (e.g., seasonally; before and after GFL landfill modifications, etc.) would allow measurement of the range and change in air quality.
- Lab costs and analysis are based on quotes and discussions with ALS Global (Environmental Services) which is accredited by the Standards Council of Canada (SCC). The timeline and media requirements include: seven business days advance notice to prepare/deliver media (up to 35 canisters/tubes), for bigger orders a 10-day notice is required.
- The listed prices are approximate values only, actual costs will be detailed in a cost estimate following the selection of a preferred sampling plan. Costs for labour assume typical industry rates (i.e., similar for an open bid call); however, if awarded costs can be updated to City Roster rates. Quotes from labs may differ depending on equipment availability, and staffing availability.
- Installation of a local meteorological station is available as an alternative for collecting weather data during the sampling campaigns if Hamilton Air Monitoring Network meteorological tower (HAMN STN29247 GFL Facility) is unavailable or has quality or other issues with data.

6. Conclusions and Recommendations

Three sampling plans are outlined in this technical memo for the purposes of determining health impacts in the areas surrounding the GFL Landfill. These alternative air quality monitoring plans provide a measured approach to quantifying

the air quality on short-term and long-term time scales. The advantages and disadvantages of these methods are outlined as well as the approximate costs.

The proposed sampling plans are provided based on the results of the MECP 2023 monitoring, best practices, and discussions with the City of Hamilton; however alternative plans can be developed upon request. For example, the short-term canister and long-term passive sampling plans could be combined to include both daily canister monitoring and long-term passive sampling. Such a comprehensive plan would provide combined information about short-term (daily) impacts as well as long-term exposures.

Although the MECP identified ammonia as a potential leachate odour source in the Provincial Officer's Order, they did not perform ammonia monitoring during their Ambient Air Monitoring Assessment Surveys. Short-term ammonia fixed location sampling is therefore only provided as a complimentary option that could be combined with the short-term fixed location canister sampling program.

The recommended sampling plan for the City to implement as an initial screening is the short-term fixed location canister sampling program. This method would measure air quality for a 7-day period which could be implemented in the spring when landfill odours are expected to become significant. For the results of the study to be statistically significant additional sampling campaigns are recommended with a minimum of three per year (e.g., one week in spring, summer, and fall) to measure and compare seasonality of air quality. Depending on the results of the sampling campaign(s), the subsequent sampling plans can be adapted (e.g., number of samples, analytes, locations, period between sampling campaigns, etc.) and the usefulness of long-term tube/cartridge sampling can be evaluated.

7. References

GFL Environmental August 2023 Air Monitoring On-Site Assessment Survey, Stoney Creek, Ontario; Ministry of the Environment, Conservation and Parks; September 1, 2023.

GFL Environmental September 2023 Ambient Air Monitoring Assessment Survey, Stoney Creek, Ontario; Ministry of the Environment, Conservation and Parks; October 5, 2023.

Provincial Officer's Order; Issued to GFL Environmental Inc., Order number 1-237438590; Tamara Posadowski, October 17, 2023.

Operations Manual for Air Quality Monitoring in Ontario; Ministry of the Environment, Conservation and Parks; July 1 2018
https://www.ontario.ca/document/operations-manual-air-quality-monitoring-ontario-0

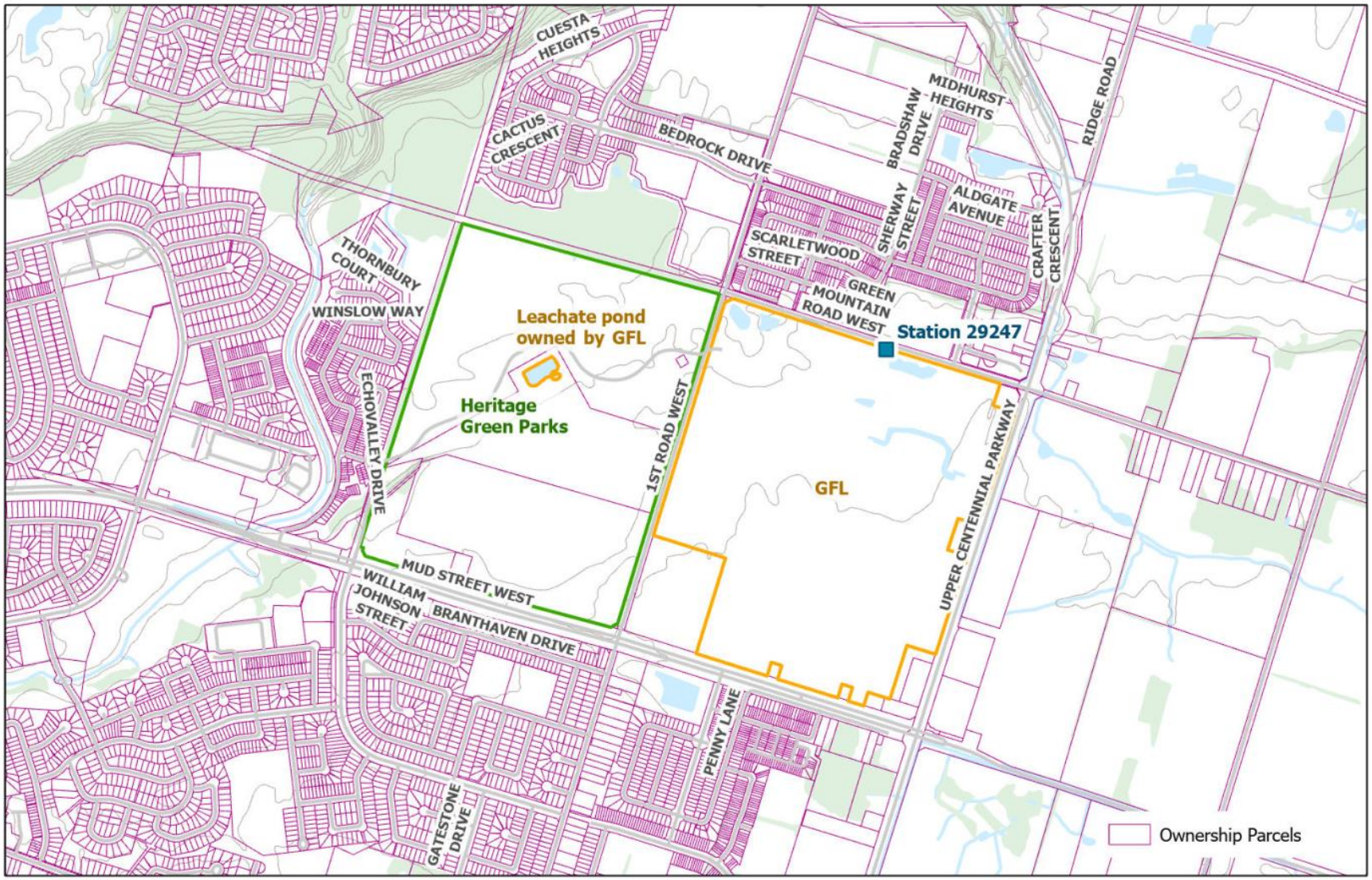
Appendix A

Figures from MECP Reports

Ontario

Figure 1 - GFL Environmental September 2023

Ministry of the Environment Conservation and Parks



Information provided by:
Ministry of the Environment and Climate Change
Ministry of Natural Resources and Forestry

Coordinate System: NAD 1983 UTM Zone 17N
Projection: Transverse Mercator
Datum: North American 1983

The maps shown here are for illustration purposes only and are not suitable for site-specific use or applications. Ministry of the Environment, Conservation & Parks provides this information with the understanding that it is not guaranteed to be accurate, correct or complete and conclusions drawn from such information are the responsibility of the user. While every effort has been made to use data believed to be accurate; a degree of error is inherent in all maps. Map products are intended for reference purposes only, and the Ministry of the Environment, Conservation & Parks will accept no liability for consequential and indirect damages arising from the use of these maps. These maps are distributed "as-is" without warranties of any kind, either expressed or implied, including but not limited to warranties of suitability to a particular purpose or use.

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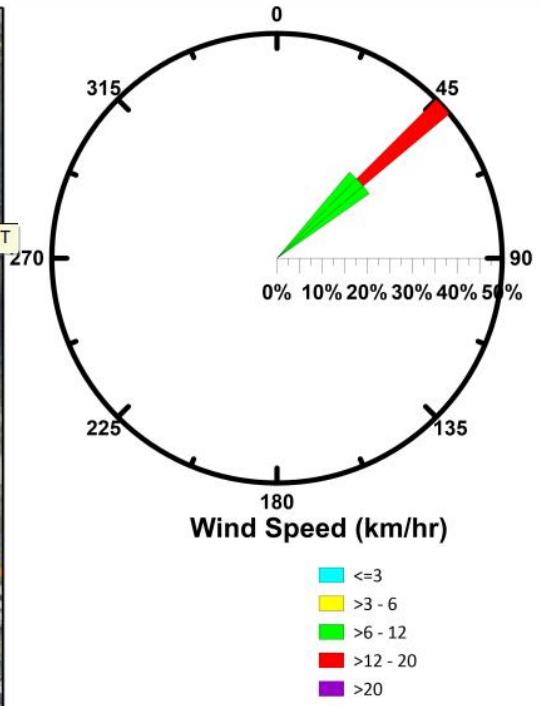
Ontario

Figure 10 - GFL Environmental August 2023
Air Monitoring On-Site Assessment Survey - Aug 28, 2023

Ministry of the Environment Conservation and Parks

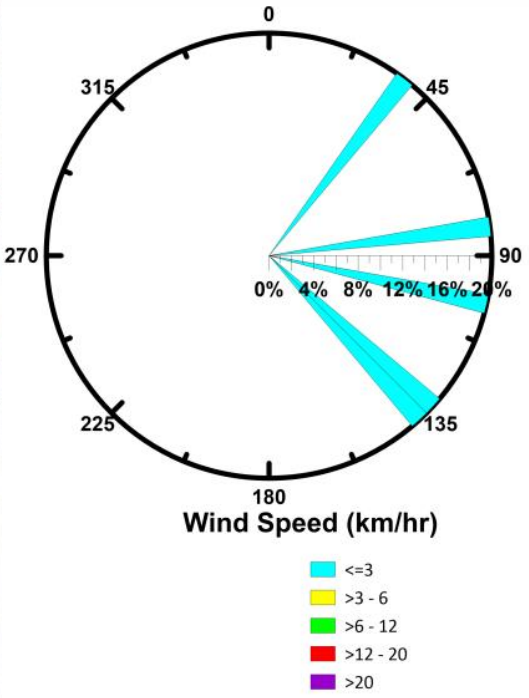


Date	Time (Location)	Name	HAPSITE Comments:	Other compounds (PM, H_2S, Nox, CO or SO_2)	Odours observations	General Comments
28-Aug-23	12:33	1	Toluene: 8.7 ug/m3 1-3-dimethylbenzene: 3.6 ug/m3	Slightly elevated H2S	Yes	Odour Survey Conducted. Odours detected
	12:55		No Compounds Detected	Measured H2S concentrations as high as 8.4 ppb	Yes	
	13:12					
	13:28	2	No Compounds Detected	-		
	13:47					
	14:05	3			No	
	14:22	4	No Compounds Detected	-	Yes	
	14:47	5	No Compounds Detected	-	No	
	15:03	6	No Compounds Detected	-	Yes	

Ontario

Figure 5 - GFL Environmental September 2023
Ambient Air Monitoring Assessment - Odour Survey - Sep 22, 2023

Ministry of the Environment Conservation and Parks



Due to equipment limitations, wind directions with wind speeds <3km/hr are unreliable

Date	Time (Location)	Name	Odours observations	D/T Ratio	General Comments
22-Sep-23	0:10	A	No	-	Complainant House #1
	0:20	B	Yes	D/T<2	Complainant House #2 - Sour smell
	0:30	C	Yes	4<D/T<7	Inside GFL Facility - Reference only - Rotten eggs
	0:40	D	Yes	4<D/T<7	Inside GFL Facility - Reference only - Rotten eggs
	0:55	E	Yes	4<D/T<7	Inside GFL Facility - Reference only - Rotten eggs
	1:28	F	Yes	D/T<2	GFL mist machine - deodourizer/ sweet
	1:43	G	No	-	Complainant House #3
	1:54	H	No	-	Complainant House #4
	2:06	I	No	-	Complainant House #5
	2:13	J	No	-	Complainant House #6
	2:30	K	No	-	Complainant House #7
	2:52	L	Yes	D/T<2	GFL mist machine - deodourizer/ sweet
	3:15	M	Yes	D/T<2	Sour smell
	3:32	N	Yes	2<D/T<4	Sour smell
	4:08	O	Yes	D/T<2	Sour smell
	4:25	P	Yes	2<D/T<4	Leachate/ waste
	4:43	Q	Yes	4<D/T<7	Rotten Eggs
	4:51	R	Yes	7<D/T<15	Rotten Eggs
	4:58	S	Yes	2<D/T<4	Rotten Eggs

Ontario

Figure 12 - GFL Environmental September 2023
Summary of 10-min TRS Exceedance locations

Ministry of the Environment Conservation and Parks

Information provided by:
Ministry of the Environment and Climate Change
Ministry of Natural Resources and Forestry

Coordinate System: NAD 1983 UTM Zone 17N
Projection: Transverse Mercator
Datum: North American 1983

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Published September 2023

Appendix B

List of Analytes and Detection Limits

Canister Sampling Analyte List

VOCs Compounds using canister	Method S621 RDL- ppbv	RDL- µg/m³
Acetone	1	2.4
Benzyl chloride	0.2	1
Bromodichloromethane	0.2	1.3
Dibromochloromethane	0.2	1.7
Dichloropropylene, cis-1,3-	0.2	0.91
Dioxane, 1,4-	0.2	0.72
Hexachlorobutadiene	0.2	2.1
Isopropylbenzene	0.2	0.98
Methyl-tert-butyl ether [MTBE]	0.2	0.72
Propylene	0.2	0.34
Styrene	0.2	0.85
Tetrachloroethane, 1,1,2,2-	0.2	1.4
Trichlorofluoromethane	0.2	1.1
Vinyl bromide	0.2	0.87
Vinyl chloride	0.2	0.51
Allyl chloride	0.2	0.63
Benzene	0.1	0.32
Bromoform	0.2	2.1
Bromomethane	0.2	0.78
BTEX, total	0.3	1.2
Butadiene, 1,3-	0.2	0.44
Carbon disulfide	0.5	1.6
Carbon tetrachloride	0.2	1.3
Chlorobenzene	0.2	0.92
Chloroethane	0.2	0.53
Chloroform	0.2	0.98
Chloromethane	0.2	0.41
Cyclohexane	0.2	0.69
Dibromoethane, 1,2-	0.2	1.5
Dichlorobenzene, 1,2-	0.2	1.2

Sulphur Compounds using canister	Method S630 RDL- ppbv	RDL- µg/m³
Carbon disulfide	2	6.2
Carbonyl sulfide	4	9.8
Diethyl disulfide	2	10
Diethyl sulfide	4	15
Dimethyl disulfide	2	7.7
Dimethyl sulfide	4	10
Dimethylthiophene, 2,5-	4	18
Ethyl mercaptan	4	10
Ethyl methyl sulfide	4	12
Ethylthiophene, 2-	4	18
Hydrogen sulfide	4	5.6
Isobutyl mercaptan	4	15
Isopropyl mercaptan	4	12
Methyl mercaptan	4	7.9
Methylthiophene, 2-	4	16
Methylthiophene, 3-	4	16
n-Butyl mercaptan	4	15
Propyl mercaptan	4	12
sec-butyl mercaptan + thiophene	6	14
t-Butyl mercaptan	4	15
Tetrahydrothiophene	4	14
Total compounds	**22**	**22**
	ppbv	**µg/m³**
Lowest RDL	**2**	**5.6**
Max RDL	**6**	**18**

Sulfur, total reduced (as H2S), 22 compounds	**25**

Dichlorobenzene, 1,3-	0.2	1.2
Dichlorobenzene, 1,4-	0.2	1.2
Dichlorodifluoromethane	0.2	0.99
Dichloroethane, 1,1-	0.2	0.81
Dichloroethane, 1,2-	0.2	0.81
Dichloroethylene, 1,1-	0.2	0.79
Dichloroethylene, cis-1,2-	0.2	0.79
Dichloroethylene, trans-1,2-	0.2	0.79
Dichloromethane	0.2	0.69
Dichloropropane, 1,2-	0.2	0.92
Dichloropropylene, cis+trans-1,3-	0.3	1.29
Dichloropropylene, trans-1,3-	0.2	0.91
Dichlorotetrafluoroethane, 1,2- [Freon 114]	0.2	1.4
Ethyl acetate	0.2	0.72
Ethylbenzene	0.1	0.43
Ethyltoluene, 4-	0.2	0.98
Heptane, n-	0.2	0.82
Hexane, n-	0.2	0.7
Hexanone, 2-	1	4.1
Methyl ethyl ketone [MEK]	0.2	0.59
Methyl isobutyl ketone [MIBK]	0.2	0.82
Naphthalene	0.1	0.52
Tetrachloroethylene	0.2	1.4
Tetrahydrofuran	0.2	0.59
Toluene	0.1	0.38
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	0.2	1.5
Trichlorobenzene, 1,2,4-	0.2	1.5
Trichloroethane, 1,1,1-	0.2	1.1
Trichloroethane, 1,1,2-	0.2	1.1
Trichloroethylene	0.2	1.1
Trimethylbenzene, 1,2,4-	0.2	0.98
Trimethylbenzene, 1,3,5-	0.2	0.98
Trimethylpentane, 2,2,4-	0.2	0.93
Vinyl acetate	0.5	1.8
Xylene, m+p-	0.2	0.87

Xylene, o-	0.1	0.43
Xylenes, total	0.3	1.3
Total VOCs to analyze	**67**	**67**
	ppbv	**µg/m³**
Lowest RDL	**0.1**	**0.32**
Max RDL	**1**	**4.1**

Passive Tube Analyte List

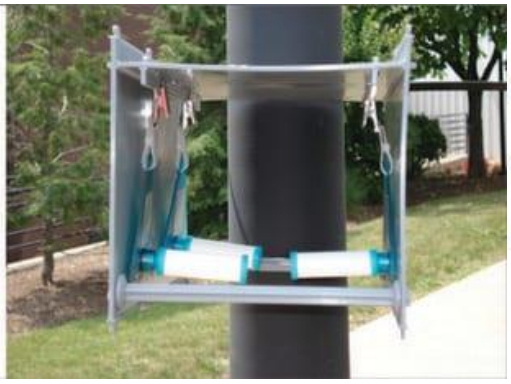
VOCs Compounds	**Method S620D RDL- µg/sample**	**RDL- µg/m³**
Allyl chloride	0.01	0.973
Benzene	0.004	0.301
BTEX, total	0.015	1.16
Butadiene, 1,3-	0.004	0.325
Chlorobenzene	0.004	0.389
Dichlorobenzene, 1,2-	0.004	0.441
Dichlorobenzene, 1,3-	0.004	0.451
Dichlorobenzene, 1,4-	0.004	0.441
Dichloroethane, 1,1-	0.004	0.348
Dichloroethane, 1,2-	0.004	0.348
Dichloroethylene, 1,1-	0.02	1.741
Dichloroethylene, cis-1,2-	0.02	1.711
Dichloropropane, 1,2-	0.004	0.382
Ethylbenzene	0.004	0.431
Ethyltoluene, 4-	0.004	0.484
Styrene	0.004	0.397
Tetrachloroethylene	0.004	0.413
Toluene	0.004	0.382
Trichloroethane, 1,1,1-	0.004	0.389
Trichloroethylene	0.004	0.397
Trimethylbenzene, 1,3,5-	0.004	0.484
Xylene, m+p-	0.008	0.863
Xylene, o-	0.004	0.431
Xylenes, total	0.01	0.965
Total VOCs to analyze	**24**	**24**
	µg/sample	**µg/m³**
Lowest RDL	**0.004**	**0.301**
Max RDL	**0.02**	**1.741**
Analysis Method Radiello 170	**RDL**	
H_2S	0.57	ppb

Appendix C

Examples of Sampling Equipment and Field Set-up

Short-Term Fixed Location Canister Sampling Equipment

Long-Term Fixed Location Passive Sampling Equipment



Continuous Sampling Equipment

HAPSITE

St. Croix Sensory Nasal Ranger (Nasal Ranger)

Ministry of the Environment, Conservation and Parks

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Ontario

Provincial Officer's Order

Order Number
1-237438590

Order Issued To
GFL ENVIRONMENTAL INC.
100 NEW PARK PL UNIT 500, VAUGHAN, ON, L4K 0H9

Site
GFL Stoney Creek Regional Facility
65 GREEN MOUNTAIN RD W, HAMILTON, ON, L8J 1X5

Refer to the Definitions section in the Provincial Officer's Report, Part B of this Order, for the meaning of all the capitalized terms that are used in this Order.

PART A - WORK ORDERED

Pursuant to my authority under **EPA | 157.1, EPA | 157,** I order you to do the following:

Item No. 1 **Compliance Due Date:** Nov-01-2023

By November 1, 2023, the Owner shall remove leachate from the Site, at a rate exceeding 500,000 litres per week, using an approved waste management system (e.g. waste hauler(s)) authorized to collect, handle, store and transport the leachate, and dispose of the leachate at a waste disposal site(s) approved to accept the leachate under the EPA, until the level of standing leachate on the liner is less than 0.5 metres, or until advised in writing by the undersigned Provincial Officer.

Item No. 2 **Compliance Due Date:** Nov-01-2023

By November 1, 2023, the Owner shall provide written confirmation to the undersigned Provincial Officer by email to Tamara.Posadowski@ontario.ca that work described in Item No. 1 has commenced.

Item No. 3 **Compliance Due Date:** Oct-19-2023

Commencing on October 19, 2023, and by noon (12:00 hrs) on each Thursday thereafter until notified in writing by the undersigned Provincial Officer, the Owner shall provide a weekly progress report to the undersigned Provincial Officer by email to Tamara.Posadowski@ontario.ca, which includes, but is not limited to the following information:

Leachate

a) The current volume of leachate at the Site;
b) The level of standing leachate on the liner;
c) The volume of leachate removed from the Site over the past week;
d) Method and location of leachate disposal, to include: volume discharged to sanitary sewer, volume transported off-site for disposal at an approved waste disposal site(s), including the name, location and ECA number of the site;
e) Detailed list of changes to the treatment of leachate at the Site, including:
I. Any changes to the physical or chemical treatment that has occurred;
II. Dates and times of these changes;
III. Specific details for each change, including chemical dosing rates, location of chemical dosing, flow rates, etc.;
IV. List of changes or adjustments planned or expected for the coming week; and
V. Parameters being monitored to inform the Owner's decisions regarding any changes being made to the leachate treatment system.

Odour Mitigation Measures
f) Details of the odour mitigation measures employed over the past week for each major odour source at the Site.
g) Assessment of the effectiveness of the odour mitigation measures and the methodology that is being used to determine the effectiveness.
h) Detailed list of any changes to odour mitigation measures that has occurred since the previous week and a list of any proposed changes for the week ahead.

Complaints
i) A summary of the complaints received by the Owner over the past week, including, but not limited to:
i. The number of complaints;
ii. Summary of actions taken by the Owner in response to the complaints;
iii. Copies of: the odour complaint reports, odour inspection logs genera

Item No. 4 **Compliance Due Date:** Oct-17-2023

Upon service of this Order, the Owner shall implement the Communication Plan, as outlined in section 4 of their report "Response to MECP Information Request, GFL Stoney Creek Regional Facility" dated September 21, 2023 and provided to the undersigned Provincial Officer, and as amended in their follow-up report dated October 13, 2023 "Response to MECP Information Request Following Review of Odour Mitigation Letter (GHD, September 21, 2023)".

Item No. 5 **Compliance Due Date:** Oct-20-2023

By October 20, 2023, the Owner shall retain the services of a Qualified Person and have the Qualified Person submit an air monitoring plan to the

undersigned Provincial Officer by email to Tamara.Posadowski@ontario.ca for acceptance, to monitor contaminant concentrations for total reduced sulphur, ammonia and other contaminants that may contribute to odour concerns from the Site. The air monitoring program shall include but not be limited to:

a) Daily fence line monitoring for total reduced sulphur, ammonia, and any other parameters recommended by the Qualified Person. The monitoring data shall be sufficient to assess against the Ministry's 10-minute and 24-hour standards as set out in Schedule 3 of Ontario Regulation 419/05 (Air Pollution – Local Air Quality);
b) Odour monitoring in the surrounding community; and,
c) A plan to communicate results to the public.

Item No. 6 **Compliance Due Date:** Oct-18-2023

Within 24 hours of service of this Order, the Owner shall post a copy of this Order on their website so that it is publicly accessible.

PART B - PROVINCIAL OFFICER'S REPORT

This Order is being issued for the reasons set out below.

Definitions

For the purposes of this Order, the following capitalized terms shall have the meanings set out below:

"ECA" means an Environmental Compliance Approval.

"EPA" means the Environmental Protection Act, R.S.O. 1990, c. E. 19.

"Ministry" means the Ontario Ministry of the Environment, Conservation and Parks.

"Order" means this Provincial Officer's Order No. 1-237438590 as it may be amended.

"Owner" means GFL Environmental Inc.

"Provincial Officer" means the undersigned provincial officer or, in the event that the undersigned officer is unable to act, any other provincial officer authorized to act pursuant to the EPA.

"Qualified Person" means a consultant, contractor or other person satisfactory to the Provincial Officer who has obtained the appropriate education and training and has demonstrated experience and expertise in the areas relating to the work required to be carried out in this Order.

"Site" means the property listed above in the Site section and further described below in the section entitled Description of the Site and/or System/Facility.

Description of Person(s) Subject to the Order

GFL Environmental Inc. (GFL) is the registered owner of the Site. GFL Environmental Inc. is an active Ontario corporation with Ontario Corporation Number 1000399619, that was amalgamated on January 1, 2023. GFL operates a waste disposal site (landfilling site) at the Site.

Description of the Site and/or System/Facility

The Site includes the property municipally known as 65 Green Mountain Rd. W., Hamilton, Ontario, L8J 1X5. For the purpose of this Order, the Site also includes the leachate pond, which is located to the west of the active landfill operations, in the Heritage Green Sports Park.

The legal description of this property for the landfilling operations is: PART LOTS 25,26 CON 6 SALTFLEET AS IN CD511860 EXCEPT PTS 4,5,6 EXPROPRIATION PLAN VM159853; EXCEPT PART 2 62R17754, PART 1 62R20381 SUBJECT TO AN EASEMENT OVER PART 2 2R21475 IN FAVOUR OF PART LOT 25 CON 6 SF, PART 1 62R10207, PARTS 3-5 62R5367

& AS IN VM200810 AS IN WE1469446 CITY OF HAMILTON, being all of PIN 170972071.

The legal description of the property upon which the leachate pond is situated is: PT LT 27 & 28, CON 6 SALTFLEET BEING PT 4, 10 & 11 ON 62R-16022; EXCEPT PARTS 2 AND 3 PL 62R20687 TOGETHER WITH AN EASEMENT OVER PT LT 27 & 28, CON 6 SALTFLEET BEING PTS 1,2,& 3 ON 62R16022 AS IN WE766756 CITY OF HAMILTON, being all of PIN 170972822.

The Site is subject to Environmental Compliance Approval No. A181008 in respect of a waste disposal site. The landfilling site is approved to receive and dispose of solid, non-hazardous waste. No hazardous, liquid industrial, or putrescible wastes may be received at the Site. The Site is 79.3 hectares in size with an approved landfilling area of 59.1 hectares. The leachate pond is located west of the active landfilling operations at 65 Green Mountain Road West and it stores treated leachate from the landfilling operations before it is discharged to municipal sanitary sewers. The leachate pond is surrounded by the Heritage Green Sports Park and the Heritage Green Community Dog Park.

To the north and south of the Site there are residential neighbourhoods, and also to the west of the leachate pond. To the east of the Site, there is agricultural lands, various recreational activities and additional residences.

Reasons for the Order

On August 25, 2023, I took over this file from Provincial Officer Joanne Placko. The off-site odour impacts caused by operations at the Site were already ongoing at this time. I spoke with Provincial Officer Placko and reviewed the complaint data received at the Ministry and determined that odour complaints about the Site started as early as April 2023, have consistently been received from residents in the surrounding community since July 2023 and are continuing up to the date of this Order. Between April 2023 and October 2023, there has been over 900 odour complaints received at the Hamilton District Office in relation to odours being generated from operations at the Site and which have impacted residents in the surrounding residential communities.

GFL has stated that they currently have elevated levels of leachate being generated at the Site. Leachate is the liquid that forms when rainwater filters through wastes placed in a landfill. When this liquid comes in contact with buried wastes, it can leach, or draw out, chemicals or constituents from those wastes. The elevated leachate levels have resulted in above-ground pooling of leachate within the waste cells, as well as a change in the chemistry and characteristics of the leachate. The exposed leachate on the Site and the leachate pond have been identified as the main source of odours impacting the surrounding residential neighbourhoods. I have detected odours from these odour sources during multiple site visits in August, September and October, 2023. I have also detected strong odours around the temporary biofilter at the Interim Leachate Pump Station and it is my opinion that these operations are also a significant source of odour emissions.

Environmental Officers from the Hamilton District Office have been completing daily odour surveys around the Site in response to the number of complaints being received, along with multiple after-hours Emergency Response Program callouts. Odour surveys are completed in

response to odour complaints when received and involve identifying and confirming the odour source (in this situation the exposed leachate and leachate pond) and checking upwind and downwind locations of the source to determine if there are any other potential odour sources. The surveys also include recording observations of odours being detected off-site away from the source, the intensity of the odours and a description of the odour. Odours of varying intensities (mild, moderate and high) have been detected at, near and away from the identified odour sources, while some odour surveys have yielded no odours being detected. Odours are typically described as a rotten egg/sulphur smell which are typical of the odour being generated by the exposed leachate and leachate pond. When I completed my odour surveys, and odours were detected around the Site and in residential neighbourhoods and/or local parks, I would also go onto the Site and have confirmed the sources of the odours, which include the leachate pond, the exposed leachate and the biofilter. Given the nature of the odour (sulphur/rotten egg), even mild odours would be considered a nuisance given the tendency of the odour to linger and have the potential to cause an adverse effect in the surrounding residential communities.

GFL has implemented the following actions to mitigate odours from the Site:
• operating an odour treatment control system (bio-filter) at the interim leachate pump station to mitigate odours during the processing of leachate prior to discharge to the sanitary system;
• deployed multiple odour neutralizing systems (misting system) at the Site;
• applying a foam surfactant to the exposed leachate blanket and to the leachate pond;
• as exposed leachate levels go down, the areas are being covered with soil to reduce the potential for any residual odours; and
• continues to explore other available odour mitigation methods.
Actions that GFL implemented that are no longer occurring:
• having leachate pumped and hauled off-site to a licenced receiving site for treatment and disposal; and,
• treating exposed leachate present onsite with ferric sulphate.

GFL informed me that the hauling of leachate off-site stopped on September 22, 2023, due to high H2S concentrations in the hauling trucks and the receiving site refused to accept any more loads until some kind of treatment could be done to the leachate prior to receiving anymore. The treating of exposed leachate with ferric sulphate was halted after a meeting on September 15, 2023, as GFL's consultant (GHD) believed it may not be helping with the odours.

Following the meeting that occurred on September 15, 2023, between Ministry staff, GFL and their consultant GHD, I sent an email to GFL requesting additional information as follow-up. GFL had GHD prepare a report in response to my email and this report was received on September 21, 2023. After I reviewed the report, I sent a letter to GFL via email on October 5, 2023, requesting additional supporting information. An additional report was received from GFL on October 13, 2023.

The following reports were received from GFL and are included in the Attachment Section of this Order:
Report 1: "Response to MECP Information Request, GFL Stoney Creek Regional Facility" received on September 21, 2023 and prepared by GHD on behalf of GFL.
Report 2: "Response to MECP Information Request Following Review of Odour Mitigation Letter

(GHD, September 21, 2023) received on October 13, 2023 and prepared by GHD on behalf of GFL.

These reports will now be referred to as Report 1 and Report 2 for the rest of this Order.

Work Ordered Item No. 1 requires the hauling of leachate via trucks to recommence. As per GFL's Report 1, section 2.1.2 states that an average of 214,370L of leachate were hauled off-site on the days the trucks were operating (additional details in Report 1, Attachment 1 - Daily Leachate Pumping Rates and Volumes). So, I believe that a minimum of 500,000L per week is a reasonable expectation based on previous trucking rates.

In GFL's Report 2, item #8 states that "It is recommended to limit the level of standing leachate on the liner to 0.5 m at any one time to be consistent with the design and operating concept." The 0.5m level referenced in Work Ordered Item No. 1 is based off this recommendation. If new information becomes available that odour issues from the Site have been mitigated, I will consider revising Work Ordered Item No. 1 as necessary.

In GFL's Report 1, section 4 outlines their communications plan and commits to "The Weekly Online Community Updates and Monthly Virtual Community Update Meetings will continue until the odour issues have been deemed resolved by GFL in consultation with the Ministry of the Environment, Conservation and Parks." Amendments to the communications plan were received in GFL's Report 2, and are found under item #16 in that report. This amendment identifies the following monthly meeting dates: October 18, November 16, and December 14, 2023, and ensures written notification is provided to all residents within 3 kilometres of the Site. It is my expectation that these monthly meetings continue until the ministry is satisfied that the odour issues have been resolved.

The Hamilton District Office engaged the assistance of MECP Regional Technical Support Group to conduct air monitoring in the vicinity of the GFL landfill in response to odour concerns from nearby residents. Ambient air monitoring was completed August 8, 9, 10,16, 17, 21, 24, 25, and 28, 2023, as well as September 1, 14, 15, 22, 28 and 29, 2023.

For the August monitoring period, no exceedances of the MECP's air standards for a contaminant set out in Schedule 3 of O.Reg. 419/05 (Air Pollution – Local Air Quality) were measured. Air monitoring in August was conducted during the daytime hours. In response to public complaints, which indicated odours were worse during the evening and early morning hours, additional monitoring during those times of concerns were planned for September. During the September monitoring period, a total of twenty-nine (29) exceedances of the Ministry's 10-minute standard for total reduced sulphur (TRS) compounds were measured (as per item 95.2 in Schedule 3, and contrary to s.20 of O.Reg. 419/05). The Ministry's 10-minute standard for TRS, as seen in Schedule 3 of Ontario Regulation 419/05, is 13µg/m3. TRS exceedances were measured at many locations surrounding the GFL facility, including in residential areas. During the September 2023 GFL Community Liaison Committee meeting, GFL's consultant, GHD, stated that the leachate odours are primarily sulphur compounds and/or ammonia. Based on this and the MECP's air monitoring results, is the reason for identifying TRS and ammonia in Work Ordered Item No. 5.

Even with the actions being implemented by GFL, the odours have been persisting and the number of complaints from residents has been increasing. Local residents have been reporting adverse effects including loss of enjoyment of property and health effects from the ongoing odours in contravention of s. 14 of the EPA. Condition 5.17 of ECA A181008 states "The Site shall be operated and maintained such that vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance." Based on the complaints being received, and the observations of multiple Environmental Officers from the Hamilton District Office, there are odours consistently being generated by the GFL Site which are causing a nuisance to the surrounding residential communities in contravention of their ECA condition.

Authority to Issue the Order

I am issuing this Order under my authority as a Provincial Officer under the following legislation, which also includes the authority to take intermediate action and/or procedural steps:

This Order is issued pursuant to EPA s. 157 and section 157.1.

I reasonably believe that GFL Environmental Inc. has contravened or is contravening those provisions of s. 14, s. 186(3) of the EPA and s. 20 of Ontario Regulation 419/05 as outlined in the Contraventions section below.

I further reasonably believe that the requirements specified in this Order are necessary or advisable so as to prevent or reduce the risk of a discharge of a contaminant, namely odours from leachate, into the natural environment from the undertaking at the Site, or to prevent, decrease or eliminate an adverse effect that may result from (i) the discharge of a contaminant from the undertaking, or (ii) the presence or discharge of a contaminant in, on or under the property.

Contraventions

EPA | 14 | (1)	(1) Subject to subsection (2) but despite any other provision of this Act or the regulations, a person shall not discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment, if the discharge causes or may cause an adverse effect.
EPA | 186 | (3)	(3) Every person who fails to comply with the terms and conditions of an environmental compliance approval, certificate of property use or renewable energy approval or of a licence or permit under this Act or who fails to comply with the terms of a report under section 29 is guilty of an offence.
EPA | O. Reg. 419/05 | 20 | (2.2)	(2.2) A person shall not discharge or cause or permit the discharge of a contaminant listed in Schedule 3 into the air if a standard is set out in Schedule 3 for the contaminant for a 10 minute averaging period and the discharge results in the concentration of the contaminant exceeding that standard at a point of impingement where human activities regularly occur at a time when those activities regularly occur.

Attachments

The attachments listed below, if any, form part of this Order:

Report 1: "Response to MECP Information Request, GFL Stoney Creek Regional Facility" received on September 21, 2023 and prepared by GHD on behalf of GFL.
Report 2: "Response to MECP Information Request Following Review of Odour Mitigation Letter (GHD, September 21, 2023) received on October 13, 2023 and prepared by GHD on behalf of GFL.

ISSUING OFFICER

Name: Tamara Posadowski

Job Title: Senior Environmental Officer

Badge Number: 1861

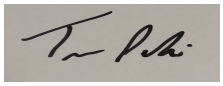
Address: 119 KING ST W, 9TH FLR, HAMILTON, ON

Officer Email: tamara.posadowski@ontario.ca

Office Email: Environment.Hamilton@ontario.ca

Date: Oct 17, 2023

Signature:



REVIEW AND APPEAL INFORMATION

REQUEST FOR REVIEW

You may request that this Order be reviewed by the Director. Your request must be made in writing or orally with written confirmation. Your written request or written confirmation of your oral request must be received by the Director within 7 days after the date this Order was served on you and must be given to the Director as indicated in the Contact Information below.

In your written request or written confirmation, you must:

- specify the portions of this Order that you wish to be reviewed;
- include any submissions to be considered by the Director with respect to issuance of this Order to you or any other person and with respect to the contents of this Order;
- apply for a stay of this Order, if necessary; and
- provide an address for service by one of the following means, in person, by mail, by commercial courier, by fax, or by email.

In response to your request, the Director may confirm, alter/amend or revoke this Order. As an intermediate step, the Director may stay this Order by providing written notice to you that additional time is required to make a decision.

The Director will serve you with a copy (written notice) of the decision to revoke this Order or of an order, a Director's Order, to confirm or alter/amend this Order, together with reasons.

DEEMED CONFIRMATION OF THIS ORDER

If within 7 days of the Director receiving your request for review you do not receive written notice of a stay, or oral or written notice of the Director's decision on your request for review, this Order is deemed (considered) to have been confirmed by Order of the Director and deemed to have been served upon you at the expiry of those 7 days.

APPEAL INFORMATION (REQUIRE A HEARING)

A. If this Order is deemed confirmed as explained above, you may require a hearing by the Ontario Land Tribunal on the deemed confirmed Order within 15 days of the deemed service date:

- you must serve as indicated in the Contact Information below, written notice of your appeal on the Ontario Land Tribunal and the Director within those 15 days of the deemed service date;

- your notice must state the portions of the deemed confirmed Order for which a hearing is required and the grounds on which you intend to rely at the hearing;
- unless you have leave (permission) of the Ontario Land Tribunal, you are not entitled to appeal a portion of the deemed confirmed Order or to rely on grounds of appeal that are not stated in your notice requiring the hearing; and
- written notice requiring a hearing must be served on the Ontario Land Tribunal and the Director as indicated in the Contact Information below.

B. If this Order is confirmed or altered/amended by the Director by a written order served upon you (as opposed to the deemed confirmation noted above), such Director's Order will include the appropriate instructions for appealing that order to the Ontario Land Tribunal.

CONTACT INFORMATION

The contact information for the Director and the Ontario Land Tribunal is the following:

Registrar
Ontario Land Tribunal
655 BAY STREET, 15th FLOOR
TORONTO, ON M5G 1E5
OLT.Registrar@ontario.ca

and

Director (Provincial Officer's Orders)
Ministry of the Environment,
Conservation and Parks
Hamilton District Office
119 KING ST W, 9TH FLR
HAMILTON, ON L8P 4Y7
Office Email: Environment.
Hamilton@ontario.ca
Fax: (905) 521-7806

The contact information of the Ontario Land Tribunal and further information regarding its appeal requirements can be obtained directly from the Tribunal at:

Tel: (416) 212-6349, Toll Free: 1(866) 448-2248 or www.olt.gov.on.ca

SERVICE INFORMATION

Service of the documentation referred to above can be made personally, by mail, by fax (in the case of the Director only), by commercial courier or by email in accordance with the legislation under which this Order is made and any corresponding Service Regulation.

ADDITIONAL INFORMATION

Unless stayed by the Director or the Ontario Land Tribunal, this Order is effective from the date of service.

Failure to comply with a requirement of this Order constitutes an offence. Unless otherwise indicated, the obligation to comply with a requirement of this Order continues on each day after the specified compliance date until the obligation has been satisfied.

The requirements of this Order are minimum requirements only and do not mean that you are not required to comply with any other applicable legal requirements, including any:

- statute, regulation, or by-law;
- federal, provincial, or municipal law; or
- applicable requirements that are not addressed in this Order.

The requirements of this Order are severable. If any requirement of this Order, or the application of any requirement to any circumstance, is held invalid, such finding does not invalidate or render unenforceable the requirement in other circumstances. It also does not invalidate or render unenforceable the other requirements of this Order.

Further orders may be issued in accordance with the legislation as circumstances require.

This Order is binding upon any successors or assignees of the persons to whom this Order is issued.

The procedures to request a review by the Director or require a hearing and other information provided above are intended as a guide. The legislation should be consulted for additional details and accurate reference. Further information can be obtained from e-Laws at www.ontario.ca/laws.

Attachments

For Provincial Officer’s Order 1-237438590

Report 1: "Response to MECP Information Request, GFL Stoney Creek Regional Facility" received on September 21, 2023 and prepared by GHD on behalf of GFL.

Report 2: "Response to MECP Information Request Following Review of Odour Mitigation Letter (GHD, September 21, 2023) received on October 13, 2023 and prepared by GHD on behalf of GFL.

Our ref: 11103232

21 September 2023

Tamara Posadowski
Ministry of the Environment, Conservation and Parks
Hamilton District Office
119 King St W
Hamilton, ON L8P 4Y7

Response to MECP Information Request, GFL Stoney Creek Regional Facility

Dear Tamara Posadowski

1. Background

GFL Environmental Inc. (GFL) owns and operates the Stoney Creek Regional Facility (SCRF) located at 65 Green Mountain Road West in Stoney Creek (Site). GFL has been working to address concerns raised by various stakeholders (i.e., general public, City of Hamilton, MECP) regarding odours emanating from the Site.

On behalf of GFL, GHD has prepared this document to outline ongoing odour monitoring and mitigation efforts at the Site. This document has been prepared in response to an information request from the MECP dated September 18, 2023 (via email). Specifically, this document provides details regarding the following items:

- Additional actions that will be taken by GFL to further mitigate odours from the Site, including the exposed leachate and leachate pond.
- Technical details of the Site leachate monitoring program and additional monitoring conducted since the leachate issues commenced.
- Details on products evaluated to help mitigate odours and timeline for implementation.
- Evaluation of the effectiveness of the current leachate treatment system, including sample analysis of the system inlet and outlet and identification of potential modifications.
- Comprehensive communications plan, including weekly electronic community updates and monthly in-person updates.
- Timeline to eliminate exposed leachate, including identification of current leachate levels, plans for reducing levels, objectives, and milestones.

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2. Odour Mitigation Actions

2.1 Leachate Discharge

It is understood that the odours are primarily associated with the leachate from the landfill. Continuous pumping and disposal to eliminate the exposed leachate in the active landfill cells is the primary focus for reducing the associated odours.

Leachate accumulates on the base liner system and is collected via the leachate collection system. Currently, GFL has the ability to collect leachate from three areas:

- Interim Leachate Pumping Station (ILPS) located in the southeast buffer zone.
- Permanent Leachate Pumping Station located at the low point of the base liner system in the southeast area of the landfill.
- Within the active landfill cell in the northeast portion of the Site.

The collected leachate is then discharged off-Site either through a direct connection to the City of Hamilton sanitary sewer under Mistywood Drive or loaded into tanker trucks for haulage to off-Site disposal location(s). The current leachate collection and disposal network is shown in Figure 1.

Figure 2.1 Leachate Collection and Disposal Network

2.1.1 Discharge to Sanitary Sewer

Collected leachate destined for discharge to the sanitary sewer is first processed through the Leachate Treatment System (refer to Section 2.2 for additional details), then sent to the leachate lagoon in the West Landfill where it is mixed with groundwater and leachate from the West Landfill and aerated prior to discharge

to the sanitary sewer. It is noted that the aeration system in the leachate lagoon is not currently in operation since aeration currently occurs at the ILPS.

Between July 1 and September 19:

- Discharge to the sanitary sewer occurred on 45 separate days.
- The pumping system was shut down on 36 separate days and no leachate was discharged to the sanitary sewer.
- The pumping system has been in continuous operation since August 18.
- An average of 638,940 litres or leachate were discharged each of those days.
- A total of 28,752,318 litres of leachate have been discharged via the sanitary sewer.

Daily leachate pumping rates and volumes discharged to the sanitary sewer between July 1 and September 19 are presented in Attachment 1.

2.1.2 Hauling for Off-Site Disposal

The haulage of leachate by tanker truck for off-Site disposal has been ongoing since August 4. Between August 4 and September 19.

- Tanker trucks have been actively used on 25 separate days.
- The capacities of the tanker trucks have ranged between 30,000 litres and 38,000 litres.
- An average of 8 tanker truck loads are hauled off-Site on active days.
- An average of 214,370 litres of leachate were hauled off-Site each of those days.
- A total of 5,359,250 litres of leachate have been hauled off-Site.

Daily leachate volumes hauled off-Site via tanker truck between August 4 and September 19 are presented in Attachment 1. The haulage of leachate by tanker truck for off-Site disposal is expected to continue until there is no longer any exposed leachate in the active waste cells and the leachate can be effectively managed via the ILPS for discharge to the sanitary sewer.

2.1.3 Pumping Rate

Current leachate pumping rates range between 71 to 255 gallons per minute (GPM). As noted above, the pump has been shutoff completely on a number of occasions since July 1. These shutdowns were due to many factors, including maintenance/repairs, system adjustments/upgrades, and as a result of discussions with the MECP and City of Hamilton. Initially, leachate was pumped at the long-term average rate of 255 GPM, however this led to a reduction in the performance of the leachate treatment system. The average leachate pumping rate since August 18 was 100 GPM. The rate was reduced while the leachate treatment system modifications discussed in Section 2.2.2 were implemented and adjusted.

Pumping has primarily been undertaken from a temporary location in the active landfill cell at the north end of the Site. A new pump has been installed at the ILPS and GFL is preparing to relocate pumping to the ILPS in the interim. With the adjustments to the leachate treatment system, it is expected that the discharge rate will be increased.

2.2 Leachate Treatment System

2.2.1 Existing Leachate Collection and Treatment System

The Site operates a leachate collection and treatment system. The collection system is installed beneath the landfilled waste, above a double liner system. Leachate is collected on the leachate collection blanket and

drains inward toward a sump at the Permanent Leachate Pumping Station location in the southeast corner of the Site.

Collected leachate is pumped to the ILPS in the southeast corner of the landfill. Hydrogen peroxide is added to the leachate within the ILPS for chemical treatment. The leachate is then gravity fed into the leachate forcemain, which conveys the leachate from the southeast corner to the northwest corner of the Active East Landfill. Impacted groundwater is collected from beneath the landfill is pumped from manhole M4 and added into the leachate forcemain prior to discharge to the leachate lagoon in the Closed West Landfill. The leachate and impacted groundwater mixture is aerated within the leachate lagoon and discharged via an overflow weir to the sanitary sewer.

2.2.2 Leachate Treatment System Modifications

Upon identification of odour concerns, the effectiveness of the leachate treatment system was evaluated, including potential modifications. This section identifies the modifications to the leachate treatment system that were implemented to address the odour concerns.

The chemical treatment was modified via replacement of the type of chemical. Hydrogen peroxide was replaced with ferric chloride, including bench testing to evaluate effectiveness and dosage, as described in Section 2.3.2. GFL continues to review the effectiveness of treatment with ferric chloride, while simultaneously considering the potential for use of alternate chemical treatment options. GFL continues to evaluate the effectiveness of treatment and adjusts the chemical dosage to optimize treatment.

GFL has also conducted surface application of chemical treatment media to the exposed leachate on the leachate blanket with the intent of mitigating odour production at the source.

Figure 2 Ferric Chloride Tote

During initial trials with ferric chloride, GFL and GHD identified that insufficient mixing and retention times were being achieved within the ILPS. A weir box was installed within the leachate mixing chamber so that the system can work as a continuous stirred tank reactor (CSTR) to provide adequate mixing and retention time.

Figure 3 Weir Box

In addition to installation of the weir box, a coarse bubble aerator was installed within the ILPS to provide mixing and aeration of the leachate. GFL and GHD continue to evaluate the effectiveness of the leachate treatment system and make adjustments to the aeration rate to optimize leachate treatment.

Figure 4 Coarse Bubble Aerator

During bench testing with ferric chloride, it was noted that the reaction produced an off-gas that contained some odour. To mitigate the odour within the off-gas, a biofilter was installed to treat the off-gas prior to release to the atmosphere. The biofilter comprises wood media to host biological activity for gas treatment. Piping was installed to capture the gas from the ILPS for passage through the biofilter container. GFL is also evaluating installation of an injection port on the ILPS outlet pipe for injection of hydrogen peroxide downstream of the ferric chloride treatment.

Figure 5 Biofilter

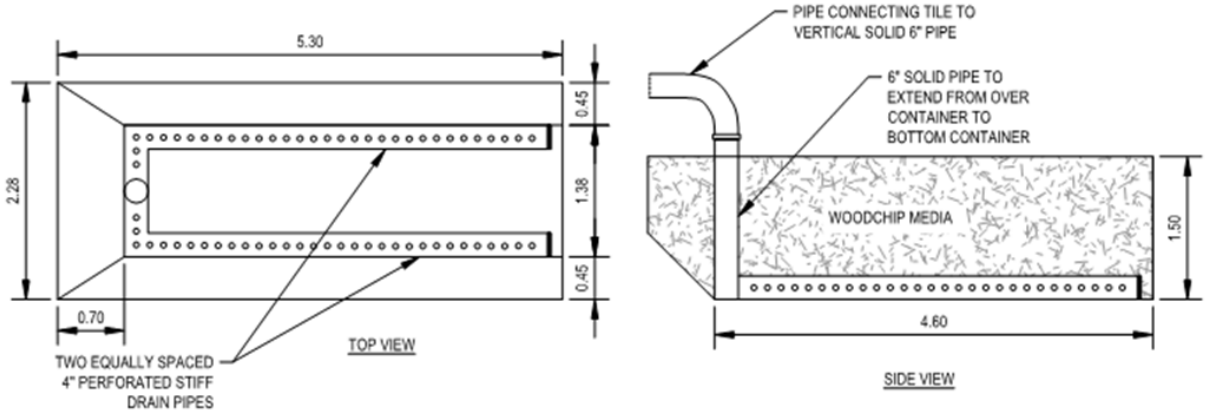

Figure 6 Biofilter Schematic

2.3 Leachate Monitoring

2.3.1 Routine Leachate Monitoring

2.3.1.1 Procedure

1. Flow reading is recorded.
2. Water Level is measured at the vertical pumping station. Critical Levels for pump operation:
    - Interim Leachate Pumping Station = 20.66 m below top of casing
    - Permanent Leachate Pumping Station = 22.60 m below top of casing
3. The Environmental Technicians enter and calculate the data in the appropriate electronic spreadsheets.

2.3.1.2 Quality Monitoring

1. Samples are collected at the collection point of the pumping station and sent to the lab for testing for the requirements detailed in accordance with ECA A181008.
2. Analytical results from all samples are returned to the Environmental staff.
3. The analytical results are recorded on spreadsheets for review by the Environmental Staff.
4. A copy of all analytical results is sent to the hydrogeological consultants.
5. The hydrogeological consultant summarizes the analytical results for inclusion in the Annual Report.

2.3.1.3 Quantity Monitoring

1. Flow is monitored by the Environmental Technicians. Flow measurements are downloaded from the data logger and temporarily stored in the computer.
2. Samples are collected at the sewer discharge point for requirements detailed in accordance with the Discharge Permit.
3. The flow data is complied on an electronic file.
4. The flow and analytical results are forwarded to the City of Hamilton on a quarterly basis.

The sewer discharge of leachate is monitored for flow and water quality in accordance with the Sewer Permits, which ensures compliance with the Sewer Use By-laws. GFL monitoring data is provided in Attachment 2.

2.3.2 Supplemental Leachate Monitoring

Leachate monitoring is completed in accordance with the Site ECA, on a quarterly basis. Historical data indicates there is no significant change in leachate characteristics. Raw leachate remains alkaline with pH level above 8. Both organic and inorganic parameters were typically within the range of historical averages.

GFL and GHD conducted bench testing to evaluate alternate chemical options for treatment, to address the recent observed reduction in effectiveness of the existing treatment system (i.e., odour concerns). Hydrogen peroxide was historically the primary treatment chemical used within the ILPS. Ferric chloride was identified as a potentially viable alternate chemical treatment, based on leachate quality.

Multiple bench tests were conducted to identify the effectiveness of ferric chloride versus hydrogen peroxide. The bench tests used the following treatment media: ferric chloride; a ferric chloride and impacted groundwater mixture (40% leachate, 60% groundwater); hydrogen peroxide; and raw leachate (control). Bench testing also evaluated the dosage required to effectively treat the leachate, including mixing with impacted groundwater.

As noted above, an off gas was observed when using ferric chloride. Odours generated from ferric chloride were observed to have reduced impact with appropriate dosage and mixing with impacted groundwater. Based on the bench test results, treatment with ferric chloride commenced on a trial basis to observe effectiveness at large-scale implementation.

Figure 7 Bench Testing

2.4 Odour Monitoring

GFL conducts ongoing monitoring activities at the Site, including the following:

- Monitoring of weather trends and wind direction
- Site and perimeter olfactory observation (i.e., physical observation) for potential odour generation and migration
- Traveling throughout community for olfactory monitoring for odours off-Site

The MECP conducts additional monitoring, including physical observation and collection of air samples for laboratory analysis.

GHD will be conducting odour and air monitoring activities, including direct monitoring of odours around the Site and collection of air samples for laboratory analysis. This monitoring program will commence the week of September 25, 2023.

2.5 Odour Mitigation

In response to odour concerns, GFL and GHD have evaluated numerous alternative products and odour mitigation systems. Evaluation has included discussion with and Site visits from suppliers, product testing, and procurement and implementation of odour mitigation products. Evaluated products include:

- Misting Systems
- Solid De-Odourizers and Neutralizers
- Foam Surfactants
- Adaptive Pond Covers

GFL and GHD have engaged multiple suppliers for the above technologies, including review of technical information, requests for quotations, hosting of Site visits, procurement, and implementation. This section provides a brief description of the evaluated technologies and suppliers. Attachment 3 provides a listing of technologies evaluated, supplying companies, contact information, and product information provided by the suppliers.

2.5.1 Misting Systems

Misting systems comprise odour control dispersion devices that emit odour neutralizing vapours. The odour control media is supplied as a liquid concentrate that is diluted, vapourized, and dispersed to neutralize odours by reacting with the contaminants in the air.

GFL evaluated misting systems supplied by Ecolo Toronto and Odor-No-More Inc. (ONM), each with their own proprietary liquid concentrate (Attachments 3A and 3B, respectively). Ecolo Toronto performed a Site visit and provided equipment for testing purposes.

GFL has ordered and implemented multiple misting systems from Ecolo Toronto. The initial misting equipment was supplied with XStreme Vapor Solution 8015 odour neutralizer on August3rd, 2023 and implemented immediately for use as required.

Figure 8 Misting System

2.5.2 Solid De-Odourizers and Neutralizers

Solid de-odourizers/neutralizers are solid or granular products that are applied directly to surfaces. These products can neutralize odours, produce scents when in contact with liquids, and absorb liquids. GFL evaluated solid application products from Bektra Corp., including Bektra Bin Balls (Attachment 3C). Bektra visited the Site and provided a sample. GFL has not pursued use of solid de-odourizers at this time, and is currently focusing on use of misting systems and foam surfactants.

Figure 9 Odour Neutralizer

2.5.3 Foam Surfactants

Foam surfactants comprise concentrated liquid odour control media that is mixed with water and spread in foam form to cover and neutralize odours that are generated on surfaces. The foam products provide temporary mitigation of odours and require re-application in accordance with manufacturer recommendations.

GFL evaluated foam surfactants supplied by Atmos Technologies, Bektra Corp., and ONM. Product information for these suppliers is provided in Attachments 3D, 3E, and 3F, respectively. Quotations were obtained for the concentrate solutions and proprietary spreading equipment from Atmos Technologies.

GFL is in the process of finalizing procurement with Atmos Technologies to supply their Atmos Shield 645 foam and appropriate spreading equipment to Site for application over the exposed leachate on the leachate blanket. Delivery of the product is anticipated the week of September 25, 2023. GFL will begin application of the foam surfactant upon receipt of the product and training from Atmos Technologies.

2.5.4 Adaptive Pond Covers

Adaptive pond covers are available in several forms. GFL and GHD evaluated the use of the Hexa-Cover® Floating Cover system. This system comprises specially designed polypropylene cover segments that are poured out of bags onto the surface of a pond. These segments auto-install and float to adjoin to each other to provide a barrier that inhibits evaporation of water, release of emissions/odours, and organic growth.

North American suppliers were difficult to identify, but GFL and GHD located a supplier in Tennessee, Southeastern Tank, and obtained product information (Attachment 3G) and a quotation for supply. The intent was that the Hexa-Cover® Floating Cover system could be used on the leachate blanket and/or the leachate lagoon as required. At this time, GFL has not proceeded to procurement. GFL is pursuing foam surfactant procurement in the immediate term, noting covering of the leachate lagoon could potentially result in odour releases occurring downstream of the discharge to the sanitary sewer, rather than at the lagoon itself.

3. Evaluation of Existing Leachate Treatment System

GFL is continually evaluating the leachate treatment process as part of the site operations and is working with GHD to develop a design for a leachate treatment facility as part of the site progression for the long-term final build.

The following sections explain the existing evaluation of the system and procedures, and the proposed leachate treatment facility.

3.1 Existing Interim Leachate Treatment System

GFL continually evaluates potential modifications to the leachate treatment system, including considerations for immediate and medium-term modifications, and long-term solutions, as follows:

Long-Term Solution: GFL and GHD are in the preliminary stages of design for a new leachate treatment system that will replace the existing leachate treatment system.

Medium-Term Modifications: GFL continues to evaluate alternate chemical treatment media for use at Site, as required based on the observed effectiveness of the leachate treatment, leachate composition, and odour control considerations. GFL revised the chemical treatment and installed a weir box and aerator within the ILPS. A biofilter was also installed to collect off-gas from the chemical reaction and treat the off-gas to reduce the potential for odours at the ILPS.

Immediate modifications are implemented as required based on odour generation, elevated leachate levels, public complaints, or other contributing factors. Immediate modifications include the following:

- Adjustments to pumping rates, aeration rate, or chemical rates to optimize leachate treatment and minimize odour production
- Continued pumping of leachate to draw down leachate levels on the leachate blanket

- Chemical/product treatment of exposed leachate on the leachate blanket and pond to mitigate odour production
- Evaluation of products for odour mitigation

3.2 Proposed Long-Term Leachate Treatment System

As part of the Site progression, GFL will be implementing a final long-term leachate treatment system and decommissioning the interim leachate treatment process.

As previously mentioned, the design is currently in the preliminary stages and in the process of beginning the full design. The long-term leachate treatment plant will include a leachate aeration tank, pipe flocculator to add chemicals such as acid, coagulant, and polymer, a dissolved air flotation (DAF) unit to separate solids with the help of micro-bubbles, and a final effluent mixing tank with an active oxidizer such as ozone or peroxide. Effluent will be discharged to City of Hamilton sanitary sewer network. The building will be under negative pressure and all foul air will be collected and treated via an odour control system prior to discharge to atmosphere. A draft process flow diagram (PFD) of the long-term leachate treatment system is provided in Attachment 4.

The long-term leachate treatment system will use a new sanitary sewer connection located on Mud Street. Following commissioning of the new leachate treatment system, flow to the leachate lagoon will cease and the leachate lagoon will be decommissioned. As the lagoon is open to the atmosphere, direct discharge to the sanitary sewer and decommissioning of the lagoon will remove a potential source for emissions.

The pre-design approval of the long-term treatment facility will require pre-consultation with the MECP and the City, which is anticipated to occur in November 2023. The design process is anticipated to be completed by the end of December 2023, followed by application for an ECA Amendment for MECP review. The MECP review process is understood to generally require one year for reviews of this magnitude. This will be a critical step to be accomplished in a timely fashion to expedite the final design, procurement, and construction.

4. Communications Plan

4.1 Overview

The goal of the communications plan is to provide timely and transparent information to the Stoney Creek community regarding measures taken to mitigate the odour issues occurring at the Site and provide the opportunity to answer questions regarding the odour issues at the Site.

The Communications Plan, described further below, entails:

- Weekly Online Community Updates;
- Monthly Virtual Community Update Meetings; and
- CLC Quarterly Online Meetings.

The Weekly Online Community Updates and Monthly Virtual Community Update Meetings will continue until the odour issues have been deemed resolved by GFL in consultation with the Ministry of the Environment, Conservation and Parks.

4.2 Description

4.2.1 Weekly Online Community Update

As requested by the Ministry, Community Updates will be posted on the SCRF website on a weekly basis (**https://gflstoneycreek.com/**). Updates will be published on Thursdays by end of day. Updates will include a description of the activities GFL has performed in the previous week to address the odour issues. In addition, updates may be posted throughout the week, if appropriate.

4.2.2 Monthly Virtual Community Update Meeting

As requested by the Ministry, monthly community update meetings will be held virtually. The meetings will be held at the end of every month via Zoom. The Community Update Meetings will provide an opportunity for GFL to provide an update to the community on activities related to mitigation of the odour issues and respond to questions from residents. Residents will be encouraged to submit questions in advance. The Community Update Meetings will be advertised on the SCRF website, by email to community members who have provided their email address to GFL, and by email to Community Liaison Committee members.

4.2.3 CLC Quarterly Virtual meetings

In accordance with the Terms of Reference in Schedule G of the Environmental Compliance Approval No. A181008 (ECA), GFL maintains a CLC. In addition to the weekly and monthly updates requested by the Ministry, GFL will continue to provide updates to the CLC. The mandate of the CLC is to provide a forum for public concerns to be raised and to serve for the dissemination, review, and exchange of information and monitoring results relevant to Site operations. In accordance with the ECA, GFL reports on complaints received in the previous quarter. Meeting minutes from the quarterly CLC meetings are published in PDF format to the CLC website (**https://gflclc.org/meetings**)**.**

5. Timelines

The table below summarizes the action items noted above and provides a timeline for their implementation.

Table 1 Anticipated Implementation Timelines

Item	Action	Timeline
Leachate Discharge	• Continue to discharge leachate to sanitary sewer. Increase flow as much as possible in consideration of pumping operations, leachate treatment system, and odour monitoring and mitigation activities. • Continue to discharge leachate using tanker trucks and hauling to alternate disposal location(s). • Adjust pumping locations (i.e., Interim Leachate Pumping Station, Permanent Leachate Pumping Station, Active Landfill Cells) as required to maximize leachate discharge. • Eliminate exposed leachate in the active landfill cells in the north of the site.	• Adjustment of pumping location will commence September 21, 2023. • Exposed leachate in active waste cells to be removed by October 6, 2023.

Item	Action	Timeline
Interim Leachate Treatment System	• Addition of chemical(s) and evaluation of alternate chemicals • Retention time adjustments • Mixing rate adjustments • Addition of post-treatment injection port for additional chemical injection –	• Adjustments ongoing • Injection port installation scheduled for September 21, 2023
Leachate Monitoring	• Sampling • Bench trials –	• Monitoring ongoing • Bench trials as required
Odour Monitoring	• Site odour monitoring and sampling (GHD) • On-site and off-site monitoring (GFL – site observations, monitoring through community) • Documentation of complaints and resulting actions • Review of MECP monitoring data	• Monitoring ongoing • Additional air monitoring and sampling commencing September 22, 2023 • Documentation, follow-up, and review ongoing as required
Odour Mitigation	• Continue operation of deodorizer units around site. Monitor performance and adjust system accordingly (i.e., number/location of units, dosing rate). • Conduct bench trials with Bioballs and apply to exposed leachate in equalization pond and active landfill cells. • Apply foam to equalization pond and active landfill cells. • Cover exposed leachate in active landfill cells with waste.	• Misting system operation ongoing • Foam application scheduled to commence week of September 25, 2023 • Additional bench trials to be completed as required • Waste placement ongoing
Long-Term Leachate Treatment System	• Complete preliminary design. • Arrange pre-consultation meeting with MECP and City of Hamilton. • Initiate permitting and approvals. • Proceed to detailed design and procurement. • System construction, commissioning, and operation.	• Pre-consultation (MECP and City) – November 2023 • Preliminary design and ECA application – End of December 2023 • MECP and City review – TBD at pre-consultation • Construction and commissioning dependent upon approvals
Communications	• Respond to community inquiries by phone/email as they arise. • Issue weekly community updates.	• First weekly community update to be issued Thursday 28th, and every Thursday thereafter

Item	Action	Timeline
	• Issue monthly community updates. • Continue to conduct quarterly CLC meetings.	• First monthly community update to be issued Monday October 30th, and end of each month thereafter • Next CLC meeting – December 4th

6. Closing

We trust that the above information adequately addresses the current concerns regarding odours from the Site. GFL remains committed to working with all stakeholders to resolve the odour issue as quickly as possible and will continue to keep the community informed of mitigation activities and address questions and concerns as they arise.

Regards

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Attachments

Attachment 1

Daily Leachate Pumping Rates and Volumes

Date	Pumping Rate GPM	Daily Total Litres Pumping Station	Daily Total Litres Trucked Off-Site	Grand Daily Total Litres
1-Jul	0.00	0	0	0
2-Jul	0.00	0	0	0
3-Jul	0.00	0	0	0
4-Jul	255.00	1,380,768	0	1,380,768
5-Jul	255.00	1,386,445	0	1,386,445
6-Jul	255.00	1,418,618	0	1,418,618
7-Jul	255.00	414,079	0	414,079
8-Jul	0.00	0	0	0
9-Jul	0.00	0	0	0
10-Jul	255.00	1,331,942	0	1,331,942
11-Jul	255.00	1,390,231	0	1,390,231
12-Jul	255.00	458,742	0	458,742
13-Jul	0.00	0	0	0
14-Jul	0.00	0	0	0
15-Jul	0.00	0	0	0
16-Jul	0.00	0	0	0
17-Jul	255.00	1,266,082	0	1,266,082
18-Jul	255.00	527,629	0	527,629
19-Jul	0.00	0	0	0
20-Jul	0.00	0	0	0
21-Jul	0.00	0	0	0
22-Jul	0.00	0	0	0
23-Jul	0.00	0	0	0
24-Jul	0.00	0	0	0
25-Jul	0.00	0	0	0
26-Jul	255.00	1,155,560	0	1,155,560
27-Jul	255.00	848,597	0	848,597
28-Jul	255.00	463,284	0	463,284
29-Jul	0.00	0	0	0
30-Jul	0.00	0	0	0
31-Jul	0.00	0	0	0
1-Aug	0.00	0	0	0
2-Aug	0.00	0	0	0
3-Aug	0.00	0	0	0
4-Aug	0.00	0	87,000	87,000
5-Aug	0.00	0	0	0
6-Aug	0.00	0	0	0
7-Aug	0.00	0	0	0
8-Aug	0.00	0	130,840	130,840
9-Aug	0.00	0	135,190	135,190
10-Aug	0.00	0	351,740	351,740
11-Aug	0.00	0	171,880	171,880
12-Aug	0.00	0	0	0
13-Aug	0.00	0	0	0
14-Aug	0.00	0	358,630	358,630
15-Aug	0.00	0	199,340	199,340
16-Aug	0.00	0	201,850	201,850
17-Aug	0.00	0	167,610	167,610
18-Aug	147.00	216,994	133,060	350,054
19-Aug	155.00	422,406	0	422,406
20-Aug	150.00	408,780	0	408,780
21-Aug	150.00	476,910	38,860	515,770
22-Aug	150.00	374,715	0	374,715
23-Aug	150.00	357,683	0	357,683
24-Aug	165.00	374,715	0	374,715
25-Aug	150.00	476,910	0	476,910
26-Aug	166.00	452,383	0	452,383
27-Aug	143.00	389,704	0	389,704
28-Aug	150.00	613,170	0	613,170
29-Aug	150.00	579,105	0	579,105
30-Aug	110.00	599,544	205,060	804,604
31-Aug	127.00	692,201	208,450	900,651
1-Sep	113.00	615,895	175,060	790,955
2-Sep	121.00	659,498	0	659,498
3-Sep	136.00	741,254	0	741,254
4-Sep	131.00	714,002	0	714,002
5-Sep	129.00	703,102	288,160	991,262
6-Sep	111.00	615,289	221,320	836,609
7-Sep	80.00	436,032	289,110	725,142
8-Sep	71.00	386,978	322,650	709,628
9-Sep	72.00	392,429	0	392,429
10-Sep	75.00	408,780	0	408,780
11-Sep	77.00	419,681	291,940	711,621
12-Sep	76.00	414,230	288,990	703,220
13-Sep	73.00	397,879	146,590	544,469
14-Sep	88 to 107	563,115	218,720	781,835
15-Sep	107.00	583,193	178,380	761,573
16-Sep	102.00	555,941	0	555,941
17-Sep	100.00	545,040	0	545,040
18-Sep	107.00	583,193	294,300	877,493
19-Sep	99.00	539,590	254,520	794,110
Subtotals Litres		28,752,318	5,359,250	
Grand Total Litres		**34,111,568**		

Attachment 2

GFL Monitoring Data

GFL Environmental
MISA ANALYTICAL TEST RESULTS
INORGANICS

PARAMETER	E.Q.Leachate 12-Mar-18 mg/L	E.Q.Leachate 7-Jun-18 mg/L	E.Q.Leachate 11-Sep-18 mg/L	E.Q.Leachate 15-Nov-18 mg/L	E.Q.Leachate 7-Mar-19 mg/L	E.Q.Leachate 6-Jun-19 mg/L	E.Q.Leachate 10-Sep-19 mg/L	E.Q.Leachate 11-Nov-19 mg/L	E.Q.Leachate 2-Mar-20 mg/L	E.Q.Leachate 4-Jun-20 mg/L
Alkalinity	2600	2300	3000	2700	2800	2600	3400	2800	3000	3200
Flouride	3	2.6	3.2	2.1	2.5	3.2	2.5	2.1	2.6	3.6
Bromide	67	<20	75	60	66	55	81	89	64	79
Phosphate	0.93	<1.0	0.34	0.42	0.54	0.6	3.6	0.71	0.6	0.95
pH	8.45	8.68	8.03	8.18	8.11	8.21	8.26	8.01	8.04	8.24
Nitrite (N02-N)	<0.20	<0.10	<0.20	<0.10	<0.10	<0.05	0.029	<0.10	<0.10	<0.005
Nitrate (N03-N)	<0.20	<1.0	<2.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<0.05
Total Kjeldahl Nitrogen (TKN)	160	160	200	170	170	170	260	200	190	220
Total Organic Carbon (TOC)	390	970	700	400	410	390	660	340	400	420
Total Phosphorus (Total P)	2.2	2.6	3.7	1.6	1.9	2.8	3.6	3.5	3.5	2.8
Specific Conductivity (umhos/cm)	13000	12000	15000	13000	14000	12000	17000	14000	13000	14000
Total Suspended Solids (TSS)	<10	14	39	13	<10	17	12	24	14	16
Cadmium (Cd)	<0.00050	<0.00050	<0.0010	<0.00010	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00045
Cobalt (Co)	0.0039	0.0039	0.0075	0.0055	0.0051	0.0034	0.0057	0.0055	0.0039	<0.025
Chromium (Cr)	0.027	<0.025	<0.050	0.024	<0.025	<0.025	<0.050	<0.025	0.015	<0.025
Copper (Cu)	0.027	0.0052	<0.010	0.0087	0.019	<0.0050	<0.010	0.0079	0.0040	<0.0045
Iron (Fe)	1.1	0.76	1.5	0.99	1.7	0.56	<1.0	1.5	0.66	0.57
Potassium (K)	1100	1000	1400	1200	1300	1100	1700	1500	1200	1400
Magnesium (Mg)	57	70	55	98	89	64	110	80	82	63
Manganese (Mn)	0.11	0.14	0.098	0.093	0.16	0.087	0.097	0.089	0.11	0.12
Molybdenum (Mo)	0.37	0.6	2.2	0.44	0.39	0.35	0.64	0.25	0.59	0.46
Sodium (Na)	1800	2000	2400	1900	2000	1700	2300	1700	1800	2300
Nickel (Ni)	0.15	0.17	0.27	0.16	0.18	0.16	0.26	0.18	0.18	0.19
Lead (Pb)	0.012	0.0028	0.0061	0.0063	0.015	0.0063	<0.005	0.0056	0.0057	0.016
Silicon (Si)	12	13	17	19	15	13	17	17	17	15
Strontium (Sr)	5.2	4.5	3.1	4.6	6.1	3.7	3.2	3.1	4.2	3.6
Titanium (Ti)	0.085	0.058	0.066	0.077	0.047	0.048	<0.05	0.032	0.029	0.035
Vanadium (V)	0.087	0.085	0.099	0.068	0.072	0.068	0.057	0.039	0.054	0.084
Zinc (Zn)	0.025	<0.025	<0.050	0.0096	<0.025	<0.025	<0.050	<0.025	0.0066	<0.025
Chloride (Cl-)	2400	2200	3000	2300	2700	2200	3300	2600	2400	3400
Biochemical Oxygen Demand (BOD (5))	280	470	820	700	340	390	540	200	340	340
OTHER PARAMETERS										
Ammonia (NH3 - N)	150	160	210	160	170	150	250	190	170	190
Phenols-4AAP	2.5	0.71	2.8	1.3	1.1	0.81	2.4	0.66	1.1	0.87
Aluminum (Al)	0.14	0.12	0.10	0.13	0.067	0.073	<0.050	0.054	0.037	0.048
Boron (B)	3.2	3.1	4.8	3.6	3.9	3.5	5.4	3.3	2.9	4.1
Barium (Ba)	0.21	0.17	0.19	0.25	0.21	0.16	0.19	0.20	0.20	0.17
Beryllium (Be)	<0.0025	<0.0025	<0.0050	<0.0005	<0.0025	<0.0025	<0.0025	<0.0025	<0.00050	<0.0020
Calcium (Ca)	44	52	25	84	83	49	66	61	74	50
Sulfate (SO4)	220	180	400	580	460	40	370	510	240	98

Explanation of Terms:
ug/L - Micrograms per litre (parts per billion)
mg/L - Milligrams per litre (parts per million)
ND - Not Detected
< - Less than
> - Greater than

GFL Environmental
MISA ANALYTICAL TEST RESULTS
INORGANICS

PARAMETER	E.Q.Leachate 1-Sep-20 mg/L	E.Q.Leachate 2-Dec-20 mg/L	E.Q.Leachate 3-Mar-21 mg/L	E.Q.Leachate 11-Jun-21 mg/L	E.Q.Leachate 20-Sep-21 mg/L	E.Q.Leachate 10-Nov-21 mg/L	E.Q.Leachate 14-Mar-22 mg/L	E.Q.Leachate 3-Jun-22 mg/L	E.Q.Leachate 13-Sep-22 mg/L	E.Q.Leachate 19-Dec-22 mg/L	E.Q.Leachate 8-Mar-23 mg/L	E.Q.Leachate 22-Jun-23 mg/L	E.Q.Leachate 8-Sep-23 mg/L
Alkalinity	3100	3200	3200	2800	3000	2800	2600	2900	3800	2500	2700	2600	2500
Flouride	3.5	3.5	3.0	2.6	3.7	3.0	3.0	2.9	3.0	2.4	2.4	2.7	2.8
Bromide	82	59	72	62	81	48	62	56	84	59	75(2)	59	59
Phosphate	1.2	1.5	0.45	1.2	1.5	1.2	0.96	0.63	0.5	1.2	0.88	1	0.3
pH	8.29	8.26	8.28	8.20	8.26	8.32	8.21	8.43	8.10	8.21	8.06	8.00	8.05
Nitrite (N02-N)	<0.10	0.055	<0.05	<0.05	<0.05	<0.05	0.011	<0.010	<0.50	<0.10	<0.050	<0.10	<0.050
Nitrate (N03-N)	<1.0	<0.05	<0.05	<0.05	<0.05	<0.50	<0.10	<0.10	<5.0	<1.0	<0.50	<1.0	<0.50
Total Kjeldahl Nitrogen (TKN)	220	230	200	230	350	170	180	170	290	190	230	190	99
Total Organic Carbon (TOC)	470	490	390	370	490	290	330	290	480	260	320	340	340
Total Phosphorus (Total P)	3.1	3.7	2.7	4.0	4.8	2.6	2.9	2.8	5.1	5.3	2.7	3	2.4
Specific Conductivity (umhos/cm)	14000	16000	14000	15000	15000	12000	12000	12000	18000	14000	16000	14000	12000
Total Suspended Solids (TSS)	21	12	18	10	14	<10	15	12	13	21	14	17	94
Cadmium (Cd)	<0.00045	<0.00045	<0.00009	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00090	<0.00045	<0.00045
Cobalt (Co)	0.0044	0.0049	0.0042	0.0039	0.0047	0.0040	0.0034	0.0032	0.0048	0.0039	<0.0050	0.0039	0.0059
Chromium (Cr)	<0.025	<0.025	0.018	<0.025	<0.025	<0.025	<0.025	<0.025	0.027	0.027	<0.050	<0.025	0.03
Copper (Cu)	<0.0045	<0.0045	0.0052	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	0.008	0.01	0.0048	0.0075
Iron (Fe)	0.79	0.72	1.2	<0.50	0.58	<0.50	<0.50	<0.50	0.81	1.2	<1.0	4	5.4
Potassium (K)	1200	1500	1300	1500	1400	1100	1000	950	1600	1300	1500	1000	940
Magnesium (Mg)	82	73	74	72	65	69	68	64	64	83	110	97	130
Manganese (Mn)	0.23	0.16	0.13	0.12	0.14	0.11	0.13	0.084	0.098	0.14	0.21	0.3	0.78
Molybdenum (Mo)	0.40	0.43	0.29	0.31	0.31	0.20	0.27	0.33	0.59	0.26	0.21	0.35	0.059
Sodium (Na)	2100	2400	2000	2100	2100	1600	1700	1600	2600	2000	2300	1900	1800
Nickel (Ni)	0.17	0.19	0.15	0.17	0.17	0.13	0.14	0.15	0.21	0.19	0.15	0.19	0.24
Lead (Pb)	0.0034	0.0036	0.005	<0.0025	0.0050	0.0049	0.0056	0.0028	0.0026	0.0076	0.032	0.016	0.009
Silicon (Si)	15	16	16	17	15	14	13	14	17	17	18	16	14
Strontium (Sr)	3.4	3.1	4.3	3.9	6.2	5.2	3.7	3.9	3.1	3.0	4.7	3.4	3.9
Titanium (Ti)	0.045	0.045	0.028	0.033	0.041	0.028	0.031	<0.025	0.032	0.028	<0.050	0.026	0.078
Vanadium (V)	0.082	0.089	0.067	0.072	0.083	0.052	0.063	0.055	0.086	0.049	0.062	0.082	0.15
Zinc (Zn)	<0.025	<0.025	0.0053	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.24	<0.050	<0.025	<0.025
Chloride (Cl-)	2900	3500	2600	2800	3100	2200	2300	2300	3400	2800	2900	2400	2100
Biochemical Oxygen Demand (BOD (5))	470	460	290	180	400	110	410	190	350	86	210	400	250
OTHER PARAMETERS													
Ammonia (NH3 - N)	200	220	190	200	230	160	170	150	240	160	230(1)	170	73
Phenols-4AAP	1.2	1.2	0.93	0.47	1.1	0.53	1.0	0.98	0.99	0.22	0.73	0.72	0.7
Aluminum (Al)	0.048	0.037	0.032	0.029	0.044	0.044	0.042	0.029	0.047	0.2	<0.049	0.04	0.12
Boron (B)	3.8	3.4	3.8	3.5	3.5	3.4	3.3	3.7	4.2	2.7	3.9	3.7	3.5
Barium (Ba)	0.15	0.14	0.18	0.18	0.23	0.20	0.16	0.16	0.2	0.17	0.26	0.19	0.19
Beryllium (Be)	<0.0020	<0.0020	<0.00040	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0040	<0.0020	<0.0020
Calcium (Ca)	79	56	46	29	43	48	46	44	25	78	75	82	77
Sulfate (SO4)	230	240	210	59	120	180	230	190	100	580	890(2)	590	500

Explanation of Terms:
ug/L - Micrograms per litre (parts per billion)
mg/L - Milligrams per litre (parts per million)
ND - Not Detected
< - Less than
> - Greater than

GFL Environmental
MISA ANALYTICAL TEST RESULTS
ORGANICS

PARAMETERS	E.Q.Leachate 12-Mar-18 ug/L	E.Q.Leachate 7-Jun-18 ug/L	E.Q.Leachate 11-Sep-18 ug/L	E.Q.Leachate 15-Nov-18 ug/L	E.Q.Leachate 7-Mar-19 ug/L	E.Q.Leachate 6-Jun-19 ug/L	E.Q.Leachate 10-Sep-19 ug/L	E.Q.Leachate 11-Nov-19 ug/L	E.Q.Leachate 2-Mar-20 ug/L	E.Q.Leachate 4-Jun-20 ug/L	E.Q.Leachate 1-Sep-20 ug/L	E.Q.Leachate 2-Dec-20 ug/L	E.Q.Leachate 3-Mar-21 ug/L	E.Q.Leachate 11-Jun-21 ug/L	E.Q.Leachate 20-Sep-21 ug/L	E.Q.Leachate 10-Nov-21 ug/L	E.Q.Leachate 14-Mar-22 ug/L	E.Q.Leachate 3-Jun-22 ug/L	E.Q.Leachate 13-Sep-22 ug/L	E.Q.Leachate 19-Dec-22 ug/L	E.Q.Leachate 8-Mar-23 ug/L	E.Q.Leachate 22-Jun-23 ug/L	E.Q.Leachate 8-Sep-23 ug/L
Group #16 - Volatile Organics																								
1,1,2,2 - Tetrachloroethane	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<4.0	<10	<10	<10	<10
1,1,2 - Trichloroethane	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<4.0	<10	<10	<10	<10
1,1 - Dichloroethane	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<2.0	<5.0	<5.0	<5.0	<5.0
1,1 - Dichloroethylene	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<2.0	<5.0	<5.0	<5.0	<5.0
1,2 - Dichlorobenzene	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<4.0	<10	<10	<10	<10
1,2 - Dichloroethane	<40	<100	<10	<10	<10	<10	<10	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<4.9	<10	<10	<10	<10
1,2 - Dichloropropane	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<10	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<2.0	<5.0	<5.0	<5.0	<5.0
1,3 - Dichlorobenzene	<40	<100	<10	<10	<10	<10	<20	<10	<20	<5.0	<20	<10	<10	<20	<10	<10	<4.0	<20	<4.0	<10	<10	<10	<10
1,4 Dichlorobenzene	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<4.0	<10	<10	<10	<10
Bromodichloromethane	<20	<50	<5.0	<5.0	<5.0	<5.0	<20	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	<100	<250	<25	<25	<25	<25	<50	<25	<50	<25	<50	<25	<25	<50	<25	<25	<10	<50	<5.0	<25	<25	<25	<25
Bromoform	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<10	<10	<10	<10	<10
Carbon Tetrachloride	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<1.9	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<2.0	<2.0	<5.0	<5.0	<5.0
Chloroform	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<2.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	<100	<250	<25	<25	<25	<25	<50	<25	<50	<25	<50	<25	<25	<50	<25	<25	<10	<50	<5.0	<25	<25	<25	<25
CIS - 1,3 - Dichloropropene	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<3.0	<10	<10	<10	<10
Dibromochloromethane	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<5.0	<10	<10	<10	<10
Ethylene Dibromide	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<1.9	<10	<10	<10	<10
Methylene Chloride	<100	<250	<25	<10	<25	<25	<50	<25	<50	<25	<50	<25	<25	<50	<25	<25	<10	<50	<20	<25	<25	<25	<25
Tetrachloroethylene	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<2.0	<5.0	<5.0	<5.0	<5.0
Trans - 1,2 - Dichloroethylene	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0
Trans - 1,3 - Dichloropropene	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<4.0	<10	<10	<10	<10
Trichloroethylene	<20	<50	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<2.0	<10	<2.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<5.0	<10	<10	<10	<10
Vinyl Chloride	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<2.0	<10	<10	<10	<10
																							<5.0
Group #17 - Non-halogenated Volatiles																							
Benzene	<20	<50	15	9.7	10	13	11	9.4	10	11	14	13	13	14	12	9.5	8.4	14	9.2	<5.0	8	11	<5.0
Ethylbenzene	27	<50	37	26	24	26	33	26	29	24	29	38	29	34	26	20	18	32	30	5.4	27	27	<5.0
Styrene	<40	<100	<10	<10	<10	<10	<20	<10	<20	<10	<20	<10	<10	<20	<10	<10	<4.0	<20	<4.0	<10	<10	<10	<10
Toluene	230	210	340	200	190	150	300	180	190	190	250	300	210	270	190	120	100	170	210	25	160	140	<10
O-Xylene	21	<50	32	25	22	23	30	24	23	19	24	28	23	28	20	14	14	24	25	<5.0	21	21	<5.0
M-Xylene + P-Xylene	47	<50	63	49	43	43	57	46	44	37	48	65	45	54	40	29	27	45	45	8.1	40	40	<5.0
Xylenes (Total)	68	<50	95	73	65	66	86	70	66	56	72	94	68	81	61	43	42	69	70	8.1	61	61	<5.0
Group #18 - Water Soluble Volatiltes																							
Acrolein	<2000	<5000	<500	<500	<500	<500	<1000	<500	<1000	<500	<1000	<500	<500	<1000	<500	<500	<200	<1000	<1000	<500	<500	<500	<500
Acrylonitrile	<1000	<2500	<250	<250	<250	<250	<500	<250	<500	<250	<500	<250	<250	<500	<250	<250	<100	<500	<500	<250	<250	<250	<250
Group #19 - Base Neutral Extractables																							
Acenaphthene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Acenaphthylene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Anthracene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Benz(a)anthracene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Benzo(a)pyrene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Benzo(b)fluoranthene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Benzo(g,h,i)perylene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Benzo(k)fluoranthene	<20	<20	<40	<50	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Biphenyl	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
Camphene	<100	<100	<200	<100	<100	<50	<100	<50	<8.0	<50	<40	<40	<10	<40	<10	<100	<20	<20	<20	<10	<4.0	<10	<100
1 - Chloronaphthalene	<100	<100	<200	<100	<100	<50	<100	<50	<8.0	<50	<40	<40	<10	<40	<10	<100	<20	<20	<20	<10	<4.0	<10	<100
2 - Chloronaphthalene	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
Chrysene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Dibenz(a,h)anthracene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Fluoranthene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Fluorene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Indeno(1,2,3 - CD)pyrene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Indole	<100	<100	<200	<100	<100	<50	<100	<50	<8.0	<50	<40	<40	<10	<40	<13	<100	<20	<20	<20	<10	<4.0	<10	<100
1 - Methylnaphthalene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	2.1	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	1.4	<2.0	<20
2 - Methylnaphthalene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	1.7	<2.0	<20
Naphthalene	<20	<20	<40	<25	<20	<10	28	37	15	<20	20	<24	21	<18	<16	23	<25	<20	<28(1)	<4.0 (1)	21	22	<20
5 - Nitroacenaphthene	<100	<100	<200	<100	<100	<50	<100	<50	<8.0	<50	<40	<40	<10	<40	<10	<100	<20	<20	<20	<10	<4.0	<10	<100
Perylene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Phenanthrene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Pyrene	<20	<20	<40	<20	<20	<10	<20	<10	<1.6	<10	<8.0	<8.0	<2.0	<8.0	<2.0	<20	<4.0	<4.0	<4.0	<2.0	<0.80	<2.0	<20
Benzyl Butyl Phthalate	<50	<200	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
BIS(2-Ethylhexyl)Phthalate	<200	<200	<400	<200	<200	<100	<200	<100	<16	<100	<80	<80	<20	<80	<20	<200	<40	<40	<40	<20	<8.0	<20	<200
DI-N-Butyl Phthalate	<200	<200	<400	<200	<200	<100	<200	<100	<16	<100	<80	<80	<20	<80	<20	<200	<40	<40	<40	<20	<8.0	<20	<200
DI-N-Octyl Phthalate	<80	<80	<160	<80	<80	<40	<80	<40	<6.4	<40	<32	<32	<8.0	<32	<8.0	<80	<16	<16	<16	<8.0	<3.2	<8.0	<80
4 - Bromophenyl Phenyl Ether	<30	<30	<100	<30	<30	<15	<30	<15	<2.4	<15	<12	<12	<3.0	<12	<3.0	<30	<6.0	<6.0	<6.0	<3.0	<1.2	<3.0	<30

Explanation of Terms:
ug/L - Micrograms per litre (parts per billion)
mg/L - Milligrams per litre (parts per million)
ND - Not Detected
< - Less than
> - Greater than

GFL Environmental
MISA ANALYTICAL TEST RESULTS
ORGANICS

PARAMETERS	E.Q.Leachate 12-Mar-18 ug/L	E.Q.Leachate 7-Jun-18 ug/L	E.Q.Leachate 11-Sep-18 ug/L	E.Q.Leachate 15-Nov-18 ug/L	E.Q.Leachate 7-Mar-19 ug/L	E.Q.Leachate 6-Jun-19 ug/L	E.Q.Leachate 10-Sep-19 ug/L	E.Q.Leachate 11-Nov-19 ug/L	E.Q.Leachate 2-Mar-20 ug/L	E.Q.Leachate 4-Jun-20 ug/L	E.Q.Leachate 1-Sep-20 ug/L	E.Q.Leachate 2-Dec-20 ug/L	E.Q.Leachate 3-Mar-21 ug/L	E.Q.Leachate 11-Jun-21 ug/L	E.Q.Leachate 20-Sep-21 ug/L	E.Q.Leachate 10-Nov-21 ug/L	E.Q.Leachate 14-Mar-22 ug/L	E.Q.Leachate 3-Jun-22 ug/L	E.Q.Leachate 13-Sep-22 ug/L	E.Q.Leachate 19-Dec-22 ug/L	E.Q.Leachate 8-Mar-23 ug/L	E.Q.Leachate 22-Jun-23 ug/L	E.Q.Leachate 8-Sep-23 ug/L
4 - Chlorophenyl Phenyl Ether	<50	<50	<100	<50	<50	<25	<50	<25	<2.4	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
BIS(2 - Chloroisopropyl)Ether	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
BIS(2 - Chloroethyl) Ether	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
Diphenyl Ether	<30	<30	<60	<30	<30	<15	<30	<15	<2.4	<15	<12	<12	<3.0	<12	<5.0	<30	8.8	<6.0	6.5	<3.0	5.2	<5.0	<30
2,4 Dinitrotoluene	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<12	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
2,6 Dinitrotoluene	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<25	<5.0	<12	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
BIS(2 - Chloroethoxy)methane	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
Diphenylamine & N-Nitrosodpa	<100	<100	<200	<100	<100	<50	<100	<50	<8.0	<50	<40	<40	<10	<40	<10	<100	<20	<20	<20	<10	<4.0	<10	<100
N-Nitrosodi-N-Propylamine	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
Group #20 - Acid Extractables																							
2,3,4,5 - Tetrachlorophenol	<40	<40	<80	<40	<40	<20	<40	<20	<3.2	<20	<16	<16	<4.0	<16	<4.0	<40	<8.0	<8.0	<8.0	<4.0	<1.6	<4.0	<40
2,3,4,6 - Tetrachlorophenol	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
2,3,5,6 - Tetrachlorophenol	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
2,3,4 - Trichlorophenol	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
2,3,5 - Trichlorophenol	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
2,4,5 Trichlorophenol	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
2,4,6 Trichlorophenol	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<5.0	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
2,4 - Dimethylphenol	<50	<50	110	52	75	38	65	79	43	59	66	87	<5.0	57	58	<50	48	28	70	11	<2.0	80	<50
2,4 - Dinitrophenol	<200	<250	<400	<200	<250	<100	<200	<100	<16	<100	<80	<80	<50	<80	<20	<200	<40	<40	<40	<20	<8.0	<20	<500
2,6 - Dichlorophenol	<50	<50	<100	<50	<50	<25	<50	<25	<4.0	<25	<20	<20	<5.0	<20	<20	<50	<10	<10	<10	<5.0	<2.0	<5.0	<50
2,4 - Dichlorophenol	<30	<30	<60	<30	<30	<15	<30	<15	<2.4	<15	<12	<12	<3.0	<12	<3.0	<30	<6.0	<6.0	<6.0	<3.0	<1.2	<3.0	<30
4,6 Dinitro-2-methylphenol	<200	<250	<400	<200	<200	<100	<200	<100	<16	<100	<80	<80	<20	<80	<20	<200	<40	<40	<40	<20	<8.0	<20	<200
2 - Chlorophenol	<30	<30	<60	<30	<30	<15	<30	<15	<2.4	<15	<12	<12	<3.0	<12	<3.0	<30	<6.0	<6.0	<6.0	<3.0	<1.2	<3.0	<30
4 - Chloro - 3 Methylphenol	<50	<50	<100	<50	<50	<30	<50	<25	<4.0	<30	31	<36	<5.0	<40	<50	<50	43	21	35	<5.0	<2.0	<5.0	<50
4 - Nitrophenol	<140	<140	<280	<140	<140	<70	<140	<70	<11	<70	<56	<56	<14	<56	<14	<140	<28	<28	<28	<14	<5.6	<14	<140
M-Cresol & P. Cresol	140	170	420	220	170	160	400	94	180	230	230	220	110	140	240	64	230	130	220	17	95	130	160
O-Cresol	<50	<50	<100	<50	<50	<25	<50	<25	28	31	29	37	22	26	26	<50	35	18	37	12	18	16	<50
Pentachlorophenol	<100	<100	<200	<100	<100	<50	<100	<50	<8.0	<50	<40	<40	<10	<40	<10	<100	<20	<20	<20	<10	<4.0	<10	<100
Phenol	190	200	810	390	300	190	640	140	310	230	1200	310	180	60	240	100	360	170	160	<5.0	98	130	210
Group #23 - Neutral Chlorinated Compounds																							
Hexachloroethane	<0.50	<0.10	<0.10	<0.10	<0.50	<0.10	<0.50	<0.50	<0.10	<0.030	<0.10	<0.10	<0.010	<0.010	<0.10	<0.10	<0.10	<0.025	<0.10	<1.0	<0.1	<0.1	<0.1
1,2,4 - Trichlorobenzene	<0.50	<0.10	<0.10	<0.10	<0.50	<0.10	<0.50	<0.50	<0.10	<0.030	<0.10	<0.10	<0.040	<0.010	<0.10	<0.10	<0.10	<0.045	<0.10	<1.0	<0.1	<0.1	<0.1
1,2,3 - Trichlorobenzene	<0.50	<0.10	<0.10	<0.10	<0.50	<0.10	<0.50	<0.50	<0.10	<0.030	<0.10	<0.10	<0.040	<0.010	<0.10	<0.10	<0.10	0.042	<0.10	<1.0	<0.1	<0.1	<0.1
Hexachlorobutadiene	<0.45	<0.090	<0.090	<0.090	<0.45	<0.090	<0.45	<0.45	<0.25	<0.030	<0.25	<0.25	<0.0090	<0.090	<0.10	<0.090	<0.090	<0.025	<0.090	<0.90	<0.090	<0.090	<0.090
2,4,5 - Trichlorotoluene	<0.50	<0.10	<0.10	<0.10	<0.50	<0.10	<0.50	<0.50	<0.10	<0.030	<0.10	<0.10	<0.040	<0.10	<0.10	<0.10	<0.10	<0.025	<0.10	<1.0	<0.1	<0.1	<0.1
1,2,3,5 - Tetrachlorobenzene	<0.50	<0.10	<0.10	<0.10	<0.50	<0.10	<0.50	<0.50	<0.10	<0.030	<0.10	<0.10	<0.040	<0.10	<0.10	<0.10	<0.10	<0.025	<0.10	<1.0	<0.1	<0.1	<0.1
1,2,4,5 - Tetrachlorobenzene	<0.50	<0.10	<0.10	<0.10	<0.50	<0.10	<0.50	<0.50	<0.10	<0.030	<0.10	<0.10	<0.040	<0.10	<0.10	<0.10	<0.10	<0.025	<0.10	<1.0	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	<1.3	<0.25	<0.25	<0.25	<1.3	<0.25	<1.3	<1.3	<0.25	<0.15	<0.25	<0.25	<0.025	<0.25	<0.025	<0.25	<0.25	<0.055	<0.25	<2.5	<0.25	<0.25	<0.25
1,2,3,4 - Tetrachlorobenzene	<0.50	<0.10	<0.10	<0.10	<0.50	<0.10	<0.50	<0.50	<0.10	<0.030	<0.10	<0.10	<0.040	<0.10	<0.10	<0.10	<0.10	<0.025	<0.10	<1.0	<0.1	<0.1	<0.1
Pentachlorobenzene	<0.25	<0.50	<0.050	<0.050	<0.25	<0.050	<0.25	<0.25	<0.050	<0.030	<0.050	<0.050	<0.040	<0.050	<0.0050	<0.050	<0.050	<0.025	<0.050	<0.50	<0.050	<0.050	<0.050
Hexachlorobenzene	<0.25	<0.10	<0.10	<0.20	<0.25	<0.050	<0.050	<0.25	<0.050	<0.030	<0.040	<0.050	<0.040	<0.10	<0.0050	<0.050	<0.20	<0.025	<0.050	<1.0	<0.050	<0.050	<0.050
Octachlorostyrene	<0.25	<0.50	<0.050	<0.050	<0.25	<0.050	<0.25	<0.25	<0.050	<0.030	<0.050	<0.050	<0.040	<0.10	<0.0050	<0.050	<0.050	<0.025	<0.050	<0.50	<0.50	<0.50	<0.50
Group #25																							
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oil and Grease	61	86	52	22	49	48	26	61	36	49	70	74	67	87	69	39	51	14	15	21	12	7	19
Oil and Grease- Animal and vegetable	54	79	51	20	48	47	25	54	33	40	60	72	51	84	57	31	37	13	13	16	10	5	16
Oil and Grease- Mineral and Synthetic	6	8	2	2	<1	<1	<1	7	3	8	10	2	15	3	13	9	13	1	2	5	1	2	3
Group #26 - Fatty and Resin Acids																							
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Palmitoleic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.010	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Palmitic Acid	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.030	<0.030	0.0096	<0.030	<0.030	0.019	<0.030	0.045	<0.03	<0.03	0.053	<0.03	<0.09	<0.03	<0.03	PENDING
Linoleic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0053	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Linolenic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Oleic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0035	<0.01	<0.10	<0.01	<0.03	<0.01	<0.01	PENDING
Pimaric Acid	<0.0030	0.003	0.0053	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0054	<0.0030	<0.0048	0.0044	0.0043	0.0034	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Sandracopimaric Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Isopimaric Acid	<0.0030	<0.0030	0.0033	<0.0030	<0.0030	<0.0030	0.0038	<0.0030	<0.0030	0.0046	0.0041	<0.0034	<0.0030	0.0043	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Palustric-Levopimaric Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0034	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Dehydroabietic Acid	0.10	0.10	0.15	0.09	0.16	0.084	0.17	0.56	0.11	0.017	0.16	0.14	0.12	0.16	0.093	0.14	0.25	0.16	0.099	0.034	0.11	0.14	PENDING
Abietic Acid	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0058	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Neoabietic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0050	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
9,10 - Dichlorostearic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.012	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.016	<0.0091	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
14 - Chlorodehydroabietic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
12 - Chlorodehydroabietic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Dichlorodehydroabietic Acid	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.01	PENDING
Group #27	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
PCBs	<0.50	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<3	<0.5	<0.5	<0.5	<0.5	<3	<3	<0.05	<0.5	<0.5	<0.05	<0.05	<0.05	<0.5	<0.5

Explanation of Terms:
ug/L - Micrograms per litre (parts per billion)
mg/L - Milligrams per litre (parts per million)
ND - Not Detected
< - Less than
> - Greater than

GFL - STONEY CREEK REGIONAL FACILITY MONTHLY ANALYTICAL TEST RESULTS SANITARY SEWER DISCHARGE POINT	RESULTS 27-Jan-20	RESULTS 25-Feb-20	RESULTS 23-Mar-20	RESULTS 23-Apr-20	RESULTS 14-May-20	RESULTS 29-Jun-20	RESULTS 29-Jul-20	RESULTS 28-Aug-20	RESULTS 25-Sep-20	RESULTS 28-Oct-20	RESULTS 27-Nov-20	RESULTS 26-Jan-21	RESULTS 25-Feb-21	RESULTS 31-Mar-21	RESULTS 29-Apr-21
Calculated Parameters	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Animal/Vegetable Oil and Grease	1.8	1.4	1.1	7.5	1.6	3.1	8.9	4.3	4.6	2.5	3.0	3.3	2.6	2.4	4.8
Inorganics	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Biochemical Oxygen Demand BOD (5)	22	17	15	100	40	32	110	68	140	65	38	63	38	28	57
Total Kjeldahl Nitrogen (TKN)	33	48	25	91	64	65	100	130	130	91	60	75	79	61	79
pH	7.77	7.8	7.79	7.87	7.71	7.99	7.62	7.83	7.72	7.81	7.59	7.54	7.97	7.79	7.9
Total Suspended Solids (TSS)	18	24	14	26	41	100	79	120	130	51	26	30	24	19	31
Sulfate (SO4)	620	740	700	680	720	760	850	790	920	870	940	800	800	720	790
Chloride (Cl-)	680	970	610	1400	1100	1200	1900	2000	2200	1500	1300	1300	1500	1100	1500
Petroleum Hydrocarbons	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Oil & Grease	1.8	1.4	1.1	10	2.1	3.1	8.9	4.3	6.0	3.8	5.2	3.3	3.7	3.4	6.4
Total Oil & Grease Mineral/Synthetic	<0.50	<0.50	<0.50	2.80	0.50	<0.50	<0.50	<0.50	1.4	1.3	2.2	<0.50	1.1	1.0	1.6
Metals	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Aluminum (Al)	0.21	0.36	0.15	0.072	0.081	0.026	0.06	0.045	0.04	0.053	0.15	0.44	0.06	0.078	0.035
Total Antimony (Sb)	0.0012	0.0018	0.0016	0.0052	0.0029	0.0024	0.0038	0.0036	0.0057	0.0028	0.004	0.0022	<0.0025	0.0017	0.0024
Total Arsenic (As)	0.0087	0.014	0.0087	0.047	0.028	0.023	0.039	0.043	0.053	0.027	0.023	0.02	0.017	0.017	0.025
Total Bismuth (Bi)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010
Total Cadmium (Cd)	<0.00010	<0.00010	<0.00010	<0.00050	<0.00010	<0.000090	<0.00045	<0.00090	<0.00045	<0.00045	<0.000090	<0.000090	<0.00045	<0.000090	<0.000090
Total Chromium (Cr)	<0.0050	<0.0050	<0.0050	0.0074	0.0052	<0.0050	0.0089	0.011	0.012	<0.025	0.0053	0.0071	<0.025	0.0051	0.0068
Total Cobalt (Co)	0.0014	0.0016	0.0011	0.0018	0.0013	0.0012	0.0022	0.0028	0.0031	<0.0025	0.0016	0.0021	<0.0025	0.0016	0.0018
Total Copper (Cu)	0.0027	0.003	0.0024	0.0026	0.002	0.002	0.0015	0.0019	0.0017	<0.0045	0.0026	0.0026	<0.0045	0.0012	<0.00090
Total Iron (Fe)	0.58	0.68	0.48	0.35	0.37	0.12	0.42	0.37	0.4	<0.50	0.8	1.2	<0.50	0.32	0.26
Total Lead (Pb)	0.0029	0.0031	0.0038	0.0034	0.0042	0.0017	0.0028	0.0021	0.0018	0.0056	0.0094	0.0098	<0.0025	0.0028	0.0018
Total Manganese (Mn)	0.19	0.17	0.21	0.14	0.12	0.042	0.16	0.11	0.14	0.16	0.27	0.25	0.20	0.15	0.12
Total Molybdenum (Mo)	0.049	0.08	0.048	0.23	0.13	0.11	0.22	0.21	0.27	0.11	0.13	0.092	0.075	0.077	0.1
Total Nickel (Ni)	0.029	0.045	0.022	0.078	0.051	0.048	0.088	0.098	0.11	0.061	0.046	0.049	0.048	0.049	0.07
Total Phosphorus (P)	0.38	0.66	0.34	1.5	0.82	1.2	2.3	2.3	2.9	1.6	1.2	1.4	1.3	0.96	1.3
Total Selenium (Se)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0022	0.0026	0.0029	<0.010	<0.0020	<0.0020	<0.010	<0.0020	<0.0020
Total Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.000090	<0.000090	<0.000090	<0.000090	<0.00045	<0.000090	<0.000090	<0.00045	<0.000090	0.0
Total Tin (Sn)	0.0067	0.01	0.0068	0.032	0.019	0.014	0.03	0.043	0.055	0.026	0.018	0.021	0.019	0.018	0.024
Total Titanium (Ti)	0.019	0.016	0.0084	0.013	0.012	0.0063	0.018	0.019	0.023	<0.025	0.015	0.023	<0.025	0.012	0.012
Total Vanadium (V)	0.0086	0.011	0.0067	0.027	0.018	0.015	0.037	0.044	0.051	0.023	0.019	0.024	0.019	0.017	0.022
Total Zinc (Zn)	0.039	0.019	0.53	0.022	0.038	0.028	0.018	0.0095	0.0074	0.027	0.08	0.044	<0.025	0.022	0.015
Volatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	<10	<10	<10	33	<10	<10	17	<10	<10	<10	<10	<10	<10	<10	<10
p+m-Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
o-Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

GFL - STONEY CREEK REGIONAL FACILITY MONTHLY ANALYTICAL TEST RESULTS SANITARY SEWER DISCHARGE POINT	RESULTS 17-May-21	RESULTS 13-Jun-21	RESULTS 16-Jul-21	RESULTS 18-Aug-21	RESULTS 14-Sep-21	RESULTS 15-Oct-21	RESULTS 10-Nov-21	RESULTS 16-Dec-21	RESULTS 26-Jan-22	RESULTS 23-Feb-22	RESULTS 14-Mar-22	RESULTS 13-Apr-22	RESULTS 10-May-22	RESULTS 1-Jun-22	RESULTS 19-Jul-22
Calculated Parameters			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L
Total Animal/Vegetable Oil and Grease	3.4	<0.50	<0.50	0.8	<0.50	2.5	5.2	2.8	1.1	<0.05	1.3	1.2	5.1	5.1	<0.50
Inorganics			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L
Biochemical Oxygen Demand BOD (5)	35	36	<2	26	6	46	34	36	10	3	12	44	47	48	27
Total Kjeldahl Nitrogen (TKN)	70	51	3.9	64	1.7	75	71	66	35	8	75	79	79	92	58
pH	7.63	8	7.33	8.01	7.81	7.77	7.75	7.78	7.79	7.9	7.68	7.58	7.61	7.79	8.09
Total Suspended Solids (TSS)	150	64	<10	66	23	28	17	45	<10	21	37	25	44	51	65
Sulfate (SO4)	820	880	910	870	760	640	580	710	840	430	600	780	680	730	790
Chloride (Cl-)	1400	1400	560	1600	530	1300	1100	1200	760	260	950	1200	1200	1500	1300
Petroleum Hydrocarbons			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L
Total Oil & Grease	3.4	1.4	<0.50	1.9	<0.50	2.5	5.8	3.8	1.1	<0.05	3.0	2.1	6.0	7.1	<0.50
Total Oil & Grease Mineral/Synthetic	<0.50	1.0	<0.50	1.1	<0.50	<0.50	0.6	1.0	<0.50	<0.05	1.7	0.9	0.9	2.0	<0.50
Metals			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L
Total Aluminum (Al)	0.026	0.019	0.039	0.44	0.26	0.12	0.083	0.2	0.073	0.48	0.33	0.078	0.10	0.069	0.13
Total Antimony (Sb)	0.002	0.0019	<0.00050	0.0026	0.00071	0.0038	0.0023	<0.02	0.001	0.00065	0.0035	0.0042	0.0049	0.0071	0.0032
Total Arsenic (As)	0.021	0.02	<0.0010	0.028	0.0017	0.026	0.023	0.03	0.0069	0.0011	0.024	0.021	0.032	0.045	0.02
Total Bismuth (Bi)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010
Total Cadmium (Cd)	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.00045	<0.000090	<0.002	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.00045	<0.000090
Total Chromium (Cr)	<0.0050	<0.0050	<0.0050	0.005	<0.0050	<0.025	0.0061	<0.01	<0.0050	<0.0050	0.0062	0.0060	0.0065	<0.025	<0.0050
Total Cobalt (Co)	0.0014	0.0012	0.00051	0.0022	0.00071	<0.0025	0.0022	0.015	0.0009	0.00071	0.0018	0.0021	0.0017	<0.0025	0.0011
Total Copper (Cu)	0.0019	<0.00090	0.0012	0.0017	0.002	0.0047	0.0025	<0.01	<0.00090	0.0029	0.0025	0.0080	0.0016	<0.0045	0.0013
Total Iron (Fe)	0.24	0.11	0.26	1	0.49	0.53	0.34	0.45	0.21	0.88	0.69	0.38	0.31	<0.50	0.35
Total Lead (Pb)	0.002	0.001	0.0018	0.001	0.0016	0.0071	0.0075	<0.01	0.002	0.0041	0.0046	0.0045	0.0025	<0.0025	0.0028
Total Manganese (Mn)	0.079	0.039	0.44	0.074	0.18	0.27	0.27	0.2	0.31	0.15	0.19	0.13	0.12	0.091	0.13
Total Molybdenum (Mo)	0.08	0.067	0.0055	0.24	0.039	0.083	0.086	0.14	0.04	0.015	0.11	0.15	0.17	0.17	0.13
Total Nickel (Ni)	0.057	0.046	0.0046	0.068	0.0073	0.063	0.056	0.071	0.018	0.0053	0.052	0.065	0.068	0.077	0.047
Total Phosphorus (P)	1.6	1	0.1	1.6	<0.10	1.3	1	1.2	0.28	0.15	0.83	1.3	1.3	1.5	0.78
Total Selenium (Se)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.010	<0.0020	<0.02	<0.0020	<0.0020	<0.0020	0.0021	0.0020	<0.010	<0.0020
Total Silver (Ag)	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.00045	<0.000090	<0.01	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.00045	<0.000090
Total Tin (Sn)	0.018	0.013	<0.0010	0.017	0.0012	0.027	0.023	0.02	0.0044	<0.0010	0.024	0.022	0.026	0.025	0.012
Total Titanium (Ti)	0.01	0.0051	<0.0050	0.019	0.0100	<0.025	0.015	0.014	<0.0050	0.017	0.021	0.011	0.017	<0.025	0.011
Total Vanadium (V)	0.017	0.012	0.00064	0.019	0.0013	0.023	0.021	0.028	0.0057	0.0028	0.023	0.024	0.028	0.028	0.017
Total Zinc (Zn)	0.019	0.0088	0.036	0.0081	0.019	0.037	0.036	0.023	0.029	0.041	0.042	0.037	0.037	<0.025	0.018
Volatile Organics			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	<10	<10	<10	<10	<10	<10	<10	12	<10	<10	<10	10	11	<10	<10
p+m-Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
o-Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

GFL - STONEY CREEK REGIONAL FACILITY MONTHLY ANALYTICAL TEST RESULTS SANITARY SEWER DISCHARGE POINT	RESULTS 17-Aug-22	RESULTS 12-Sep-22	RESULTS 19-Oct-22	RESULTS 23-Nov-22	RESULTS 6-Dec-22	RESULTS 4-Jan-23	RESULTS 8-Feb-23	RESULTS 8-Mar-23	RESULTS 11-Apr-23	RESULTS 11-May-23	RESULTS 14-Jun-23	RESULTS 12-Jul-23	RESULTS 24-Aug-23
Calculated Parameters	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Animal/Vegetable Oil and Grease	6.1	1.5	2.0	<0.50	<0.50	0.8	5.6	3.0	3.2	4.6	4.2	9.9	1.2
Inorganics	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Biochemical Oxygen Demand BOD (5)	76	32	32	9	5	10	120	18	89	32	46	210	80
Total Kjeldahl Nitrogen (TKN)	180	98	170	48	32	14	130	54	73	39	90	110	26
pH	8.02	8.28	7.9	8.1	7.95	7.9	7.8	7.71	7.55	7.81	8	7.82	7.7
Total Suspended Solids (TSS)	87	84	81	37	37	16	29	26	15	21	34	26	16
Sulfate (SO4)	760	790	650	1000	1000	1000	1100	910	1100	860	880	990	780
Chloride (Cl-)	2700	1800	2200	1300	1200	780	1700	1000	940	710	1100	1600	650
Petroleum Hydrocarbons	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Oil & Grease	7.0	1.5	3.5	<0.5	<0.5	0.8	6.2	4.3	5	5.4	7.1	13	1.2
Total Oil & Grease Mineral/Synthetic	0.9	<0.50	1.5	<0.5	<0.5	<0.5	0.6	1.3	1.8	0.8	2.9	2.7	<0.50
Metals	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Aluminum (Al)	0.13	0.21	0.12	0.5	0.82	0.19	0.27	0.38	0.078	0.064	0.098	0.061	0.047
Total Antimony (Sb)	0.0084	0.0052	0.0042	<0.02	0.0015	0.0011	0.0065	0.0025	0.0043	0.0036	0.01	0.024	0.0011
Total Arsenic (As)	0.051	0.035	0.032	0.01	0.0051	0.002	0.041	0.013	0.033	0.028	0.068	0.14	0.007
Total Bismuth (Bi)	<0.0010	<0.0010	<0.0050	<0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Cadmium (Cd)	<0.000090	<0.000090	<0.00045	<0.002	<0.000090	<0.000090	0.00033	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090
Total Chromium (Cr)	0.01	0.0053	<0.025	<0.01	<0.0050	<0.0050	0.0095	<0.0050	0.006	<0.0050	0.0059	0.01	0.009
Total Cobalt (Co)	0.0028	0.002	0.0027	<0.002	0.00098	0.00092	0.0032	0.0014	0.0032	0.0011	0.0014	0.0024	0.0019
Total Copper (Cu)	0.0018	0.0016	<0.0045	<0.01	0.0022	0.0017	0.0081	0.0027	0.0075	0.0023	0.0018	0.0036	0.0026
Total Iron (Fe)	0.53	0.55	0.58	0.89	0.86	0.41	1.1	0.69	0.43	0.26	0.31	0.36	2.7
Total Lead (Pb)	0.002	0.0017	<0.0025	<0.01	0.0027	0.0035	0.038	0.0055	0.012	0.0024	0.0036	0.0068	0.0024
Total Manganese (Mn)	0.036	0.049	0.046	0.074	0.086	0.3	0.33	0.2	0.23	0.17	0.16	0.2	0.51
Total Molybdenum (Mo)	0.42	0.34	0.26	0.079	0.064	0.034	0.15	0.052	0.1	0.069	0.15	0.25	0.027
Total Nickel (Ni)	0.13	0.084	0.12	0.034	0.022	0.0089	0.08	0.031	0.064	0.035	0.064	0.11	0.048
Total Phosphorus (P)	2.6	1.3	2.4	0.38	0.19	0.051	2.2	0.46	0.72	0.51	0.79	1.5	0.3
Total Selenium (Se)	0.0032	<0.0020	<0.010	<0.02	<0.0020	<0.0020	0.0025	<0.0020	<0.0020	<0.0020	<0.0020	0.0028	<0.0020
Total Silver (Ag)	<0.000090	<0.000090	<0.00045	<0.01	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090
Total Tin (Sn)	0.031	0.014	0.02	<0.02	0.0021	0.001	0.021	0.0082	0.018	0.0094	0.021	0.048	0.0036
Total Titanium (Ti)	0.025	0.0140	<0.025	0.0130	0.0270	0.0080	0.0240	0.0160	0.013	0.0075	0.0130	0.017	0.0140
Total Vanadium (V)	0.053	0.026	0.037	0.013	0.0062	0.003	0.036	0.014	0.024	0.017	0.029	0.048	0.021
Total Zinc (Zn)	0.009	0.0054	<0.025	0.021	0.02	0.036	0.035	0.037	0.046	0.022	0.0077	0.024	0.021
Volatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	<10	<0.20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	<10	<0.20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	<10	<0.20	<10	<10	<10	<10	22	<10	12	<10	<10	24	<10
p+m-Xylene	<10	<0.20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
o-Xylene	<10	<0.20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	<10	<0.20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Attachment 3

Odour Mitigation Product Information

Company	Contact	Technology	Product	Attachment
Ecolo Toronto 4545 Eastgate Parkway, Unit 2, Mississauga, ON L4W 3W6	Nick Darwish O: 905-625-4533 ext. 22 **ndarwish@ecolotoronto.com**	Misting System	XStreme Vapor Solution 8015	3A
Odor-No-More Inc. 14921 Chestnut St, Westminster CA 92683	Dane Espinoza 714-369-5991 **de@odornomore.com**	Misting System	CupriDyne Concentrate Iodine	3B
Bektra Corp. 220 Bayview Drive, Unit 6-7, Barrie, ON L4N 4Y8	Michael Beckley O: 705-734-2422 C: 705-817-7017 **mike@bektra.com**	Solid De-odourizer	Bektra Bin Balls	3C
Atmos Technologies 216 Garfield Ave, West Chester, PA 19380	Gregg Campbell 919-593-8538 **gcampbell@atmos-technologies.com**	Foam Surfactant	Atmos Shield 645 Atmos Soil Equivalent Foam AC-667 SE	3D
Bektra Corp. 220 Bayview Drive, Unit 6-7, Barrie, ON L4N 4Y8	Michael Beckley O: 705-734-2422 C: 705-817-7017 **mike@bektra.com**	Foam Surfactant	Bektra Bio-Key 880I	3E
Odor-No-More Inc. 14921 Chestnut St, Westminster CA 92683	Dane Espinoza 714-369-5991 **de@odornomore.com**	Liquid Surfactant	CupriDyne Clean Powder Iodine	3F
Southeastern Tank 60 Vesta Road, Lebanon, TN 37090	Marc Nichols 615-653-0529 **marc@setank.com**	Adaptive Pond Cover	Hexa-Cover 114	3G

Waterless Vapor Odor Control Cannon

AirStreme™

AOC-E150-TV

The AirStreme™ AOC-E150-TV is a self-contained odor control cannon that emits waterfree odor neutralizing solutions in the form of vapor. The feature rich oscillating vapor cannons are built for stand-alone odor control operation and can be used to replace much larger water-based odor control systems.With these vapor cannons, there will be no need to worry about water supply or winterization issues.

The AOC-E150-TV Vapor Cannon uses XStreme™ Solutions, which are powerful odor neutralizers similar to Ecolo’s AirSolution™ line but contain 0% water and are highly concentrated. The waterless XStreme™ Vapor Solutions are designed to function in below-freezing temperatures to combat odor complaints all year round. Unlike masking agents, it works through the process of odor counteraction by reacting with malodorous molecules to form new, larger molecules with a lower vapor pressure which become undetectable.

Ordering Information:

Product Code:	10-AOC-E150-TV
Current Composition:	12 Amps
Electrical Composition:	220 VAC - 1Ph - 60Hz
Power Cable Length:	10 ft / 3 m
Fan Starter:	Direct
Emergency Stop:	Yes
Control Panel Buttons:	• Vapor START/STOP • Fan START/STOP • Oscillate • Manual Turn

Product Specifications:

	Net	Shipping*
Weight:	570 lbs / 258 kg	904 lbs / 410 kg
Length:	44” / 1.12 m	48” / 1.22 m
Width:	44” / 1.12 m	48” / 1.22 m
Height:	84” / 2.13 m	90” / 2.28 m
Elevation, HAND:	-20º to 60º	
Programming:	Event cycle with 24/7	
Base:	36” x 36” with fork truck pockets	
Construction:	• Control panels - stainless steel • Chassis - hot dipped galvanized steel	

* Shipping weight (904lbs./410kg.) includes vinyl cover + 1 case (16L) of vapor solution

WATERLESS ODOR TREATMENT

OSCILLATING MOTION

INDEPENDENT MULTI-ZONE OPERATION

BELOW-FREEZING COMPATABILITY

PLUG-AND-PLAY

Applicable Areas:

ECOLO TORONTO
ODOUR MANAGEMENT SOLUTIONS

Waterless Vapor Odor Control Cannon

AirStreme™

AOC-E150-TV

Note:

The data contained herein is furnished for informational purposes only. It is the user’s responsibility to determine suitability for their purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. Ecolo makes no representations, expressed or implied, either in fact or by operation of law, statute or otherwise.

Ecolo specifically disclaims, except for the company standard 1-year warranty on the equipment (including parts) and 90 days warranty on the XStreme vapor heads, all warranties, whether written or oral, expressed or implied, including any warranties as to quality, merchantability or fitness for a particular purpose, arising from the sale or use of Ecolo’s products. Ecolo specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.

We recommend that each prospective user test the proposed application before repetitive use, using this data as a guide. This product may be covered by one or more Canadian, American, or foreign patents or patent applications.

Ordering Information:

XStreme™ Vapor Solutions:

#8015	#8023	#8012	#8014
50-XST-8015-P4-4000 4 x 4L (Case)	50-XST-8023-P4-4000 4 x 4L (Case)	50-XST-8012-P4-4000 4 x 4L (Case)	50-XST-8014-P4-4000 4 x 4L (Case)
50-XST-8015-C20 20L (Pail)	50-XST-8023-C20 20L (Pail)	50-XST-8012-C20 20L (Pail)	50-XST-8014-C20 20L (Pail)
50-XST-8015-181KG 200L (Drum)	50-XST-8023-181KG 200L (Drum)		

Conversions:

cm / 2.54 = inch kg x 2.2 = lbs

* AirStreme is a trademark owned by Ecolo Odor Control Technologies Inc.

The Dispersion of the Solution — The Process of Odor Neutralization — The Formation of New Molecules

Ecolo Toronto

Email: info@ecolotoronto.com

ECOLO ODOUR MANAGEMENT SOLUTIONS TORONTO

AirSolution and Chemical Reactions

Most sites with problematic odors require solutions that will permanently neutralize the odors and not be confused with perfumes or masking agents. Successful treatment is measured by a lack of odor, less complaints, or occasionally detection of a pleasant note in the air.

Technology behind AirSolution and XStreme Solution

AirSolution and XStreme odour neutralizers uses Two-Aldehyde technology, which blends two classes of aldehydes to permanently and significantly neutralize the unpleasant odors. The patented two aldehyde technology permanently reacts with these common malodors to produce either a new odorless compound that is heavier and less volatile, or a modified reaction compound that smells much more pleasant but is quickly volatilized. Two Aldehyde technology has proven very effective against sulfur compounds (rotten egg), organic acids such as capric acid, caproic acid and valeric acid (perspiration, cheesy and vomit odors) and various amines generated in the breakdown of proteins (decay and urine odor). Many malodor molecules are sulfur compounds, or primary or secondary amines and are chemically reactive with the aldehydes of AirSolution or XStreme Solution.

Examples of naturally occurring aldehydes and ketones include vanillin (from Vanilla bean), cinnamaldehyde (from cinnamon bark), benzaldehyde (from bitter almond), camphor, (R)-carvone (spearmint oil), (S)-carvone (caraway seed oil), Z-jasmone (scent of jasmine). Ecolo Odour Neutralizing products are composed of a blend of plant extracted materials in a format appropriate for the application. These materials vary from highly complex mixtures (essential oils), to single chemicals. Below is a list of the most important materials incorporated in AirSolution.

Essential Oils
Camphor Oil
Cinnamon Leaf Oil
Cedarwood Oil
Cornmint Oil
Eucalyptus Oil
Lemon Oil
Lime Oil
Orange Oil
Peppermint Oil
Pine Oil
Rosemary Oil
Spearmint Oil

Single Chemicals
Amyl Acetate
Aldehyde C12
Cinnamic Aldehyde
Citral
Cirtronellal
Coumarin
Ethyl Acetate
Eugenol
Geraniol
Methyl Salicylate

Every AirSolution and XStreme Solution has its specific formula that has been designed to eliminate some particular odor. Therefore, the difference between AirSolution varieties is in specific materials required in the formula and their individual concentration.

Method of Application

This permanent neutralization of odors is aided by the method of AirSolution application; high pressure misting, fogging, or vaporization allows the product to achieve intimate contact with the odorous air to effectively contact the odorous molecules. This is generally the most efficient and economical method of neutralization. The reaction occurs nearly instantly when the prepared and misted solution contacts the odorous air stream. If the solution were to require 10 seconds of contact time to completely mix with the air from an odorous site in a 20km/h wind (6m/s), the reaction would be complete within 60 meters of the installed distribution method.

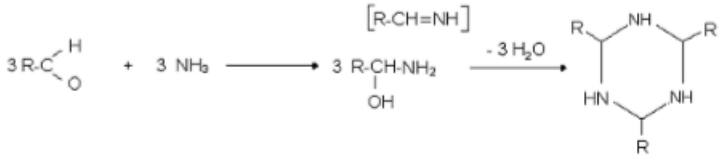
In some cases, direct addition to waste water may be recommended. This method can be useful in scrubber applications and are associated with complete utilization of the product as it is metered in as required. This is useful when a scrubber stack is the point source releasing the odors. The Two-Aldehyde technology has been tested in many field applications against a variety of odors when being finely dispersed by air or when added directly to the waste.

Chemical Equations:

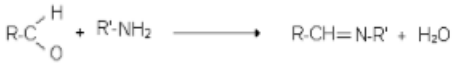
AirSolution will be presented with a wide array of odors. Rarely will only one offensive odor be present in an air stream, so the complexity of the formulation helps combat real world odors.

Reaction of an aldehyde with:

- Ammonia (in gas phase)

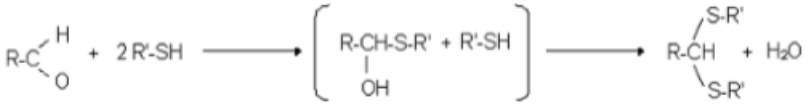


- A primary amine



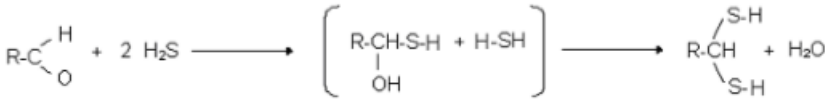
- A secondary amine

- A mercaptan



(Thioacetal)

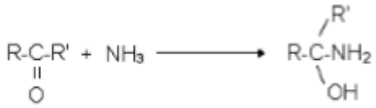
- Hydrogen sulfide



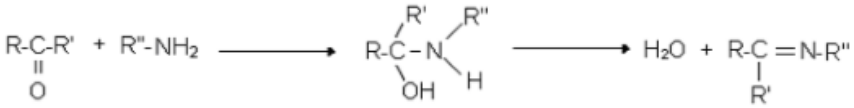
(Thioacetal)

The reaction of a ketone with:

- Ammonia

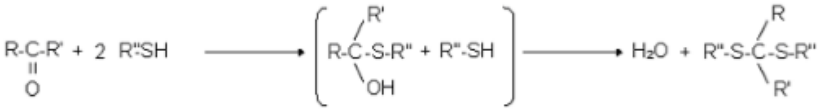


- A primary amine



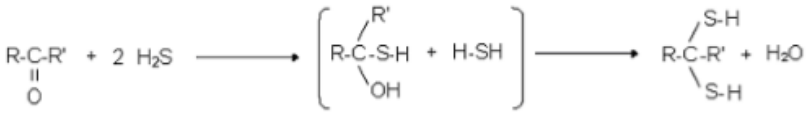
- A secondary amine

- A mercaptan



(Thioacetal)

- Hydrogen sulfide



(Thioacetal)

The end products are generally larger and heavier, with the change resulting in a new molecule without the original odor characteristics. The product is safe, biodegradable and environmentally sound. The permanent removal of the odors from the air stream significant improves the quality of air

ECOLO TORONTO ODOUR MANAGEMENT SOLUTIONS

SAFETY DATA SHEET

8015

XStreme Vapor Solution Concentrates

Material: **XStreme Vapor Solution 8015**
Revision Date: August 5, 2022

1. IDENTIFICATION

Product Identification:
Product Name: **XStreme Vapor Solution Series Concentrate**
Synonyms: None
Chemical Family: Mixture
Application / Use: Deodorizer
Supplied By: Ecolo Odor Control Systems Toronto
4540 Eastgate Parkway, Unit 2
Mississauga, ON L4W 3W6
Prepared By: Technical Services
Telephone number of preparer: (905) 625-4533
24-Hour Emergency Telephone Number : CANUTEC 613-996-6666

2. HAZARDS IDENTIFICATION

The product is not classified.
Information pertaining to special dangers for human and environment:
Adverse physicochemical effects:
Adverse human health effects and symptoms:
Eye Contact: May irritate eyes**.**
Skin Contact: May cause minimal skin irritation in sensitive individuals
Ingestion: May cause indigestion
Adverse environmental effects: There is no known ecological information for this product
Other adverse hazards: There is no additional information for this product.

Label Elements

Hazard Statements:

H315 + H320 May cause skin and eye irritation if direct contact with liquid

Precautionary Statements

P264 Wash contaminated skin thoroughly after handling
P280 Wear protective gloves/eye protection
P302 + P352 If on skin: Wash with plenty of water
P305 + P351 + P338 If in eyes: Rinse cautiously with water for serval minutes. Remove contact lenses.
P321 Specific treatment (see medical advice on this label)
P333 + P313 If skin irritation or rash occurs: Seek medical advice/attention

P337 + P313 If eye irritation persists: Seek medical advice/attention
P370 + P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish
P403 Store in well-ventilated place
P501 Dispose of contents/container in accordance with local regulations

Contains

(R)-p-mentha-1,8-diene, 2-methoxy-4-prop-2-enylphenol, (E)-3-phenylprop-2-enal, 2-oxabicyclo (2,2,2)octane, 1,3,3-trimethyl, citral, 3,7-dimethyloct-6-enal

This product does not contain any substances classified as PBT or vPvB

3. COMPOSITION / INFORMATION ON INGREDIENTS

Mixtures

Isopentyl acetate CAS number: 123-92-2	10-30%
benzaldehyde CAS number: 100-52-7	5-10%
bicyclo(2,2,1) heptan-2-ol, 1,7,7-trimethyl-exo CAS number: 125-12-2	5-7%
(R)-p-mentha-1,8-diene CAS number: 5989-27-5	5-10%
2-(2-[4-(1,1,3,3-tetramethylbutyl)phenoxy]ethoxy)ethanol CAS number: 9036-19-5	1-5%
3-cyclohexene-1-methanol,a,a,4-trimethyl CAS number: 98-55-5	1-5%
2-methoxy-4-prop-2-enylphenol CAS number: 123-92-2	10-30%
(E)-3-phenylprop-2-enal CAS number: 104-55-2	1-5%
methyl 2-hydroxybenzoate CAS number: 119-36-8	1-5%
2-oxabicyclo (2,2,2)octane, 1,3,3-trimethyl CAS number: 470-82-6	1-5%

pentyl 2-hydroxybenzoate CAS number: 2050-08-0	1-5%
chromen-2-one CAS number: 91-64-5	<1%
citral CAS number: 5392-40-5	<1%
1,3-benzodioxole-5-carbaldehyde CAS number: 120-57-0	<1%
4,6,6-trimethylbicyclo[3,1,1]hept-3-ene CAS number: 80-56-8	<1%
(2E)-3,7-dimethylocta-2,6-dien-1-ol CAS number: 106-24-1	<1%
3,7-dimethyloct-6-enal CAS number: 106-23-0	<1%
4-isopropylidene-1-methylcyclohexene CAS number: 586-62-9	<1%
3-methylbutan-1-ol CAS number: 123-51-3	<1%
ethyl acetate CAS number: 141-78-6	<1%

4. FIRST AID MEASURES

General Information: Immediate medical attention is not required
Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing. Remove contact lenses and rinse eyes with water.
Skin Contact: Remove contaminated clothing and launder before reuse. Wash contaminated skin with mild soap and water for 15 minutes. Get medical attention if irritation persists.
Inhalation: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and get immediate medical attention.
Ingestion: Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs
Notes to Physician: Treat symptomatically

Hazards: Contact with eyes, skin and though inhalation
Treatment: No specific antidote. Treatment based on sound judgment of physician and individual Reactions of patient.

5. FIRE FIGHTING MEASURES

Flammable Properties: Fire or intense heat may cause violent rupture of packages
Suitable Extinguishing Media: CO2, Dry Chemical, Universal - Type foam.
Unsuitable Extinguishing Media: Not available
Hazardous Decomposition Materials (under fire conditions): CO2, CO
Specific Hazards Arising from the Chemical: Thermal decomposition can lead to release of irritating gases and vapors
Autoignition Temperature: Not applicable
Flammable Limits in Air (%): Not Available**.**
Special Exposure Hazards: Combustible Liquid
Special Protective Equipment: In any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIIOSH (approved or equivalent) and full protective gear
NFPA Ratings for This Product Are:
HEALTH 0, FLAMMABILITY 2, INSTABILITY 0, PERSONAL PROTECTION: "B" .
HMIS Ratings for This Product Are:
HEALTH 0, FLAMMABILITY 2, PHYSICAL HAZARD 0, PERSONAL PROTECTION: Safety Glasses and Gloves

Protective actions during firefighting

Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. If a leak or spill has not ignited, use water spray to disperse vapours and protect men stopping the leak. Avoid discharge to the aquatic environment.

Special protective equipment for firefighters

Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Firefighter's clothing that provides a basic level of protection during chemical incidents is defined by the Canada Occupational Health and Safety Regulations, by provincial guidelines on occupational health and safety or by NFPA standards if applicable.

6. ACCIDENTAL RELEASE MEASURES

WARNING: Combustible. Eliminate all ignition sources
Personal Precautionary Measures: Wear appropriate protective equipment. Avoid contact with spilled or leaked material.
Environmental Precautionary Measures (Large Spills): Evacuate hazard area of unprotected personnel. Wear appropriate respirator and protective clothing. Shut off source of leak if it is safe to do so. Prevent entry into sewers or streams, dike if needed. Larger amounts may be collected with a sorbent material and place in an appropriate waste disposal container.
Procedure for Clean Up (Small spills): Wipe up small spills with an absorbent cloth or paper toweling. Mop up with plenty of soapy water, dilute with running water. May be treated with an absorbent material and placed in a tightly sealed container for proper disposal.

7. HANDLING AND STORAGE

Handling:

Advice on safe handling: Avoid contact with eyes and skin. Use with adequate ventilation. Avoid breathing vapour.
Protective measures:
Technical Measures:
Measures to prevent aerosol and dust generation: not applicable
Measures required to protect the environment: Keep containers tightly closed when not in use.
Specific requirements or handling rules: Wear gloves and goggles or glasses while mixing or pouring.
Precautions against fire and explosion: Avoid excessive heat, sparks, open flame or smoking near product. Rinse empty containers before disposal to prevent vapour build up. If container is to be reused, keep tightly closed and do not rinse.
Further information: wash/wipe the outside of containers and skin thoroughly after handling.

Storage:

Technical measures and storage conditions: Store tightly closed container. Keep away from heat, sparks, open flame, direct sunlight and all incompatibles.
Packaging materials: Store in original containers
Requirements for storage rooms and vessels: Cool, dry area recommended
Suggestions for storage assembly: No Further Recommendations
Storage class: Not Available
Further information on storage conditions: Local Ventilation Sufficient if well ventilated
Specific uses (for end products): Deodorization

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limit values: **Occupational exposure limits:**
Biological limit values: Not available
DNEL and PNEC-value(s) as applicable: Not available
Exposure Controls: **Occupational exposure controls:** Not available
Technical measures to prevent exposure: General ventilation.
Personal protection equipment:
Respiratory Protection: General Ventilation
Hand protection: Rubber Gloves
Eye protection: Safety goggles or glasses recommended in case of splashing
Skin protection: Rubber Gloves. Minimize skin contact. Wash with soap and water before eating, drinking, smoking or using the toilet
Other Personal Protection Data: Eye wash kit should be available.

Hygiene measures

Wash hands thoroughly after handling. Wash at the end of each work shift and before eating, smoking, and using the toilet. Do not eat, drink or smoke when using this product.

Respiratory protection

Avoid excessive inhalation of concentrated gas. Ensure all respiratory protective equipment is suitable for its intended use and is NIOSH approved. R95 Particulate filtering or equivalent facepieces Respirators should comply with any relevant provincial regulation and/or provincial guidelines applicable to health and safety at work. Half mask and quarter mask respirators with replaceable filter cartridges should comply with the Canadian regulation on health and safety at work, SOR/86-304, Part XII (12.7) and any relevant provincial regulation relating to health and safety at work. Using an R95 approved particulate respirator is recommended.

Environmental exposure controls:

Water (incl. sewage plant): Not applicable
Air: Not applicable
Soil: Not applicable

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Clear pale yellow to dark yellow
Odour:	Characteristic
Odour Threshold	No information available
pH:	Not applicable
Melting point/range (°C):	Not Available
Boiling point/range (°C):	>100 °C
Flash point (°C):	>80°C Closed cup
Evaporation Rate	<1 (butyl acetate =1)
Flammability (solid, gas):	Not Applicable
Upper/lower flammability or explosive limits	No information available
Explosive properties:	Not Available
Oxidizing properties:	Not Available.
Auto-Ignition temperature (°C):	Not Available
Vapor pressure (°C):	Not Available

Decomposition Temperature	Not Available
Relative density (g/cm3):	0.925-0.945 @ 20 C
Water solubility (20°C in g/l):	Insoluble.
Partition coefficient n-Octanol/Water (log Po/w):	Not Available
Viscosity, dynamic (mPa s):	Kinematic viscosity <20.5 mm2/s
Vapor density:	>1
Evaporation rate:	<1
Dust explosion hazard:	Not Applicable
Explosion limits:	Not Applicable
Substance groups relevant properties:	Not Available

Other information (where applicable like surface tension, miscibility, fat solubility, conductivity, gas group, etc): Not Available

% Volatile by Volume:.	Not Available

10. STABILITY AND REACTIVITY

Reactivity: There is no known reactivity hazards associated with this product

Chemical Stability: Stable at normal ambient temperatures and when used as recommended. Stable under the prescribed storage conditions.

Hazardous Polymerization: This product presents no significant reactivity hazard. Hazardous polymerization will not occur.

Conditions to Avoid: Keep away from heat, sparks and flame. Avoid hot work and sources of ignition on or near empty containers.

Materials to Avoid: No specific material or group of materials is likely to react with the product to produce a hazardous situation.

Hazardous Decomposition Products: Does not decompose when used and stored as recommended. Thermal decomposition or combustion productions may include the following substances. Harmful gases or vapours.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Ingestion: If ingested, may cause nausea.

Skin Corrosion/Irritation: Irritating. Wash skin if splashed

Respiratory sensitization : Based on available data the classification criteria are not met.

Serious Eye damage/irritation: Based on available data the classification criteria are not met.

Skin Sensitisation: May cause skin sensitisation or allergic reactions in sensitive individuals.

Germ Cell mutagenicity: Based on available data the classification criteria are not met.

Repeated Dose Toxicity (sub-acute to chronic): Not available

Acute Test of Product:
Acute toxicity Oral: LD50: >2,000 mg/kg (calculated, oral/rat)

Acute Dermal LD50: LD50>5,000 mg/kg

Acute Inhalation LC50: >2 mg/l. 8/H (rat) Vapour

Carcinogenicity Comment: Based on available data the classification criteria are not met.

IARC Carcinogenicity: Based on available data the classification criteria are not met.

Reproductive Toxicity/Teratogenicity/Embryotoxicity/Mutagenicity: Based on available data the classification criteria are not met.

Specific target organ toxicity -single exposure
STOT-single exposure: Not classified as a specific target organ toxicant after a single exposure

Specific target organ toxicity – repeated exposure
STOT- repeated exposure: Not classified as a specific target organ toxicant after repeated exposure

Aspiration hazard: Based on available data the classification criteria are not met.

Inhalation: No specific symptoms known

Ingestion: May cause sensitive or allergic reactions in sensitive individuals. Redness. Irritating to skin

Eye contact: May cause temporary eye irritation

Route of exposure: Ingestion, Inhalation, Skin and or eye contact

Target organs: No specific target organs known

General information: The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

12. ECOLOGICAL INFORMATION

Aquatic toxicity Information: Not Available

Soil toxicity Information: Not available

Air toxicity Information: Not available

Mobility **Known or predicted distribution to environmental compartments:**
Surface tension: Not available
Adsorption/Desorption **Soil-water:** Not available
Water-air: Not Available
Soil-air: Not Available

Persistence and degradability
Abiotic Degradation(in sea-water, fresh-water, air, soil): Not Available.

Physical-and photo-chemical elimination (ozonolysis, oxidation, photo-oxidation, de-chlorination, photo-mineralisation): Not Available.

Biodegradation: All data not available.

Bioaccumulative potential
Partition coefficient n-octanol /water (log KO/W): Not Available.
Bioconcentration factor (BCF): All data not available
Longterm-Ecotoxicity: Not Available

Results of PBT assessment: Not available

Other adverse effects (ozone depletion, photochemical ozone creation, endocrine disruption, global warming, etc): Will not deplete the ozone layer. Other data Not Available

Further ecological information (as applicable): No additional remark

13. DISPOSAL CONSIDERATIONS

Waste management measures (as applicable):

Can be incinerated, when in compliance with local regulations. Can be landfilled when in compliance with local regulations.

Appropriate disposal of packaging: Empty containers should be rinsed with hot water a minimum of three times and recycled or disposed of through an approved waste management facility.

Additional information (including any national or regional provisions): Not Available

14. TRANSPORT INFORMATION

ICAO/IATA Not regulated as a hazardous material or dangerous good for transportation.

IMO/IMDG Not regulated as a hazardous material or dangerous good for transportation.

RID/ADR Not regulated as a hazardous material or dangerous good for transportation.

Marine Pollutant: Not a pollutant

15. REGULATORY INFORMATION

Chemical Safety Assessment : Not Available
Canada: D2B. Possible irritation to eyes
WHMIS Classification:
CPR: Compliance: This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all the information required by the CPR.
Hazard symbols and hazard statements for labelling: No special labelling required
R-Phrases:

R36: Irritating to eyes.

S-Phrases:

S2: Keep out of the reach of children
S3/7/9: Keep container tightly closed in a cool, well-ventilated place.
S16: Keep away from sources of ignition - No smoking.
S24/25: Avoid contact with skin and eyes.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37/39: Wear suitable gloves and eye/face protection.

Special provisions concerning the labelling of certain preparations: Not available
Authorization and/or restrictions on use: Not available
Other EU regulations: Not available
Information according 1999/13/EC about limitation of emissions of volatile organic compounds (VOC-guideline): Not available
National regulation Information: Not available

16. OTHER INFORMATION

NOTICE TO READER:
Disclaimer:

ECOLO TORONTO ODOUR MANAGEMENT SOLUTIONS

SAFETY DATA SHEET

8015

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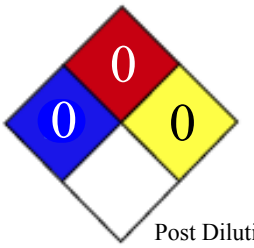
Training instructions (as applicable): Not applicable
Recommended restrictions on use (as applicable): Not applicable
*****END OF SDS*****



Product Specifications

2014

CupriDyne® Clean Industrial Odor Eliminator Concentrate

Description: Concentrated Odor Eliminator utilizing a proprietary blend of micronutrients that is highly effective against all organically derived odors.

Intended Use: In and around animal housing, dumps, trash receptacles, industrial sludge and waters.

Product Features:
Eliminates odor in minutes vs. hours
Eco-friendly and non-toxic, when diluted
Utilizes micronutrients for odor control

Limitations: Requires dilution. Do not use in concentrated form.

Key Components:
Iodine
Cuprous Iodide
Sulfamic Acid
Potassium Bicarbonate
Water

Mixing Instructions: Apply appropriately diluted product following Instructions for Use.

Application Instructions: For best results clean all debri and organic matter from all surfaces to be treated first. Apply to the air and all hard surfaces in a fine mist above and on all affected areas. Safe for human and animal contact in diluted form.

Instructions for Use: Dilute per label instructions and apply to affected area through misting, pressurized sprayer or other spraying mechanism and allow to sit. Do not rinse . Test on inconspicuous area of surface to be treated first.

Mechanism of Action: Oxidation of organic compounds. Most odorous compounds are oxidized to Hydrogen and Oxygen (including sulfurs and ammonia).

Storage: Store in cool, dry place

Compliances: None

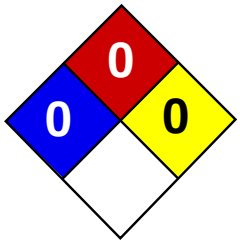
Precautions: Refer to appropriate MSDS (material safety data sheet). For technical assistance call (949) 643-9540

Odor No More, Inc. 14921 Chestnut St. Westminster, CA 92683 Phone (949)643-9540 Fax (949) 315-3621

Warranty: Odor No More® will replace any defective material. Because the storage, handling and application of this material are beyond our control, we can accept no liability for the results obtained.

Disclaimer: All information on this data sheet is based on laboratory testing and practical use by third parties. Odor-No-More® makes no representations or warranties of any kind concerning this data.

Odor-No-More®
www.OdorNoMore.com



Health	0
Fire	0
Reactivity	0
Personal Protection	B

Safety Data Sheet
Iodine Solution, 0.025N SDS

Section 1: Chemical Product and Company Identification

Product Name: CupriDyne®
Concentrate Iodine (Requires Dilution)

CAS#: Mixture.

RTECS: Not applicable.

TSCA: TSCA 8(b) inventory: Iodine; Cuprous Iodide
Sulfamic Acid: Potassium Bicarbonate; Water

CI#: Not applicable.

nonym: Free Iodine Solution

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Odor No More, Inc.
14921 Chestnut St.
Westminster, CA 92683

US Sales: **1-888-400-2863**
International Sales: **1-888-400-2863**

Order Online: info@odornomore.com

24HR Emergency Telephone, call:
1-949-295-3622
For non-emergency assistance, call: 1-888-400-2863

Section 2: Hazards Identification

Potential Acute Health Effects: DIlute
Non-hazardous in case of skin contact, of eye contact, of ingestion, of inhalation.

Potential Chronic Health Effects: Dilute
Non-hazardous in case of skin contact, of eye contact, of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not Avaiable

Section 3: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Iodine	7553-56-2	0.025
Cuprous Iodide	7681-65-4	0.01
Sulfamic Acid	5329-14-6	< 1
Potassium Bicarbonate	298-14-6	< 1
Water	7732-18-5	>98

Toxicological Data on Ingredients: Iodine: ORAL (LD50): Acute: 14000 mg/kg [Rat]

Section 4: First Aid Measures

Eye Contact: Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not breathe excess gas/fumes/ vapour/spray. Avoid contact with skin. Wear suitable protective clothing. If you feel unwell, seek medical attention and show the label when possible.

Storage:
No specific storage is required. Use shelves or cabinets sturdy enough to bear the weight of the chemicals. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection: Safety glasses. Lab coat. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
Iodine CEIL: 0.1 (ppm) from ACGIH (TLV) CEIL: 1 (mg/m3) from OSHA Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: Not applicable.

Color: Clear/Slight yellow tint

pH (1% soln/water): 5.5-6.5

Boiling Point: The lowest known value is 100°C (212°F) (Water).

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: Weighted average: 1.01 (Water = 1)

Vapor Pressure: The highest known value is 17.535 mm of Hg (@ 20°C) (Water).

Vapor Density: The highest known value is 0.62 (Air = 1) (Water).

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, acetone.

Solubility:
Easily soluble in cold water, hot water. Soluble in diethyl ether. Partially soluble in methanol, acetone.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Slightly reactive to reactive with oxidizing agents, combustible materials, organic materials, metals, acids.

Corrosivity:
Slightly corrosive to corrosive in presence of aluminum, of zinc, of copper. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not Available

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
DEVELOPMENTAL TOXICITY: Not Available

Other Toxic Effects on Humans: Non-hazardous in case of skin contact, of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not Available

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous degradation products are not likely.

Toxicity of the Products of Biodegradation: Not available.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Iodine;
Massachusetts RTK: Iodine, TSCA 8(b) inventory: Iodine; Water

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):

DSCL (EEC):
This product is not classified according to the EU regulations.

HMIS (U.S.A.): No SIgnificant Health Risk.

Health Hazard: 0

Fire Hazard: 0

Reactivity: 0

Personal Protection: b

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 0

Reactivity: 0

Specific hazard: 0

Protective Equipment:
Gloves. Lab coat. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 05/28/2015 4:00 AM UPDATED: 03/21/2019

Disclaimer:

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bektra™

Performance Advantages

- Light weight
- Free- flowing
- Excellent dimensional strength
- True odor neutralization
- Anti-slip features
- Easy clean-up
- Long lasting scent release

WINTER MINT

BEKTRA BIN BALLS Wintermint

Granular Odor Neutralizer

Bektra Bin Balls are industry unique spheres of post consumer mineral offering
Triple Action Performance:
1. Spheres infused with true odor neutralizing technology
2. Scent release formula activates on contact with liquids
3. Absorption of liquids without clumping
Unlike conventional clay granular product that is not only heavy and becomes greasy, or hard as brick to clean up, the free-flowing balls maintain dimensional strength making clean up a breeze. The sphere porosity and strength provide absorption with anti-slip features and a consistent release of odor neutralizing compounds for long lasting results against the toughest odors.

SPECIFICATIONS:

Appearance: White spheres of porous mineral
Odor: Pleasant key notes
Stability: 1 year at ambient temperature

DIRECTION FOR USE:

Bektra Bin Balls are free flowing and non-clumping granules designed for easy application on any surface. Sprinkle freely over areas to combat nuisance malodors and dispose into waste containers as required. For routine use in trash and recycling bins, pour Bin Balls into the bottom before filling with trash and repeat as necessary. Used as directed, Bin Balls are non-polluting, non-hazardous and safe for use around people, pets and plants.

PACKAGING:

BBS101-0016	4x4L	(4x1.3 gal bottle)	5kg.	(11 lbs.)
BBS101-0020	20L	(5.3 gal carton)	5.3kg.	(12 lbs.)
BBS101-0110	110L	(30 gal drum)	22kg.	(48 lbs.)
BBS101-0200	200L	(53 gal drum)	53kg.	(117 lbs.)

STORAGE & HANDLING:

Keep out of reach of children. Use scoop to sprinkle over areas of use - do not use bare hands. Keep container closed when not in use. Do not store in areas of high temperature or direct sunlight.

COMMON AREA OF USE:

Trash room floors
Bins & compactors
Transfer stations
Agra-food processing yards
Material recovery facilities

bektra.com

220 Bayview Drive, Unit 7
Barrie, ON L4N 4Y8
705-734-2422

ATMOS

Alternative Daily Cover for Odor & VOC Control

ATMOS

Pioneering Environmental Solutions

FEATURES

- Biodegradable
- Non-hazardous
- Non-combustible
- No ambient temperature limits
- Consumes no valuable airspace
- Withstands moderate rainfall
- Maintains integrity up to 72 hours
- No leachate interference
- No clean-up necessary
- Easy to use
- Scavengers cannot see or smell the trash

FROM INDUSTRY LEADING TECHNOLOGY TO ON-SITE SERVICE, ATMOS' FOAM TECHNOLOGY IS THE MOST ADVANCED AND COST EFFECTIVE ALTERNATIVE DAILY COVER AND ODOR CONTROL SOLUTION

Atmos Cover ADC

Atmos Technologies' Alternative Daily Cover is a highly engineered system of aqueous foam and application equipment that effectively meets the performance criteria of Subtitle D. The cover material, Atmos Cover ADC, is a non-hardening protein based foam that can be adjusted to last from overnight to over a weekend.

Atmos Cover ADC forms a barrier between the waste and the atmosphere to provide both an immediate and effective barrier to minimize odors, VOC's, disease vectors and blowing litter. It can also be applied directly to liquid surfaces such as lagoons and retention ponds.

Pneumatic Foam Unit (PFU) 2500

Big, Quick & Powerful

The self-propelled unit is ideal for sites where quick coverage of large areas is important. The PFU 2500 is self-contained and designed to meet the rugged demands of solid waste landfills and environmental remediation sites. The Atmos Cover ADC is applied by our 12 foot wide, rear-mounted, bi-directional spray bars, hose reels, or front monitor system. A climate controlled safety cab provides the operator with superior safety and comfort while applying the cover. The Atmos ADC system is built for a quick, one-person operation.

The unit includes diesel driven hydraulics, air compressor, rubber tracks and drive assemblies, pump, hoses, solution storage tank, freeze protection and our proprietary foam-generating technology. This unit is designed to operate with Atmos' Bulk Storage & Dilution System (BSD).

ATMOS

Pioneering Environmental Solutions

17 Campus Boulevard, Suite 100, Newtown Square, PA 19073

Phone: 610-436-4314 atmos-technologies.com

FEATURES

Durable, rubber tracks

CAT ® C-7 Engine
Maintenance free

SPECIFICATIONS

Solution Tank
2500 Gallons

Coverage Rate
400-800 Sq. Ft./Min.

Size
Length: 29'6"
Width: 8'6"W
Height: 10'9"H

Weight
40,000 Lbs

Application
Spray bars, hose reel, monitor nozzle

Freeze Protection
120 VAC or 230 VAC, 30A, single phase

Atmos Cover ADC
The Best Solution for Odor and VOC Control

The Turn Key Solution
The Atmos setup includes foam concentrate, application equipment, bulk storage, mixing center training and a full maintenance program.

Cost Effective
No capital investment and no rental fees for equipment. Overall cost lower than other ADCs.

Zero Lost Airspace
Improves the value of the landfill by extended the useful life and maximizes the return on investment

Superior Coverage
The foam layer provides superior performance versus other products. The multi-directional spray bars ensure no gaps or shadowing for odors to escape.

Quick & Easy to Use
Atmos Cover ADC can be applied effectively by a single trained employee; simple daily setup and no clean-up is required

Apply in All Temperatures
Improves site operations even under the harshest, cold weather conditions. Withstands snow, moderate rainfall, extreme temperatures, and wind.

Atmos Cover performs as a soil equivalent cover

CONTROL FOUL ODORS
Atmos Cover ADC forms a complete barrier to odors. The foam forms an impenetrable barrier around the working face .

CONTROL BLOWING LITTER
Atmos Cover ADC is holds down the waste to prevent blowing trash.

CONTROL FIRE HAZARDS
Atmos Cover ADC is non-combustible. Sites often write it into their fire prevention plan. Our combustibility testing is available upon request.

CONTROL DISEASE VECTORS
Atmos Cover ADC forms a barrier that prevents odors or visual attraction. Vectors will not land on, peck at or move into the foam covered area.

CONTROL SCAVENGERS
Atmos Cover ADC prevents scavengers' sight or smell of the trash

Technical Data Sheet

ATMOS

Atmos Shield 645

The Odor Control Foam

Atmos Shield 645 foam concentrate produces a thick, long lasting foam barrier for immediate suppression of dust, odors, and volatile organic compounds (VOCs). Atmos Shield 645 provides superior emissions control for a period of up to 24 hours. It has been specified for use at Superfund and other hazardous waste sites across the United States and Canada. The product is designed for use exclusively in Atmos Technologies' Pneumatic Foam Units.

Features

Zero PFOS / PFAS
Biodegradable
Non-Hazardous
Non-Reactive
Use at any ambient temperature

Benefits

Immediate setup & control of VOCs
Requires only water dilution
Vary duration with dilution level
No clean-up
Will not add to soil volume

Applications

Primary applications for Atmos Shield 645 is for control of odors, VOCs, and dust during active excavation and for overnight coverage of contaminated soils at hazardous waste sites. Wintergreen or vanilla can be added to customize the scent.

The product can also be applied on liquid surfaces, such as lagoons and retention ponds.

ATMOS
Pioneering Environmental Solutions

17 Campus Boulevard, Suite 100
Newtown Square, PA 19073 Phone:
610-436-4314
atmos-technologies.com

ATMOS

SAFETY DATA SHEET

SOIL EQUIVALENT FOAM AC-667 SE

Section 1. Identification

GHS product identifier : SOIL EQUIVALENT FOAM AC667SE

Chemical name : Proprietary Surfactant.

Other means of identification : Aqueous anionic surfactant mixture.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Aqueous Surfactant. Spray application for VOC and Odor control.

Area of application : Industrial applications.

Supplier/Manufacturer : Atmos Technologies, Inc.
17 Campus Blvd., Suite 100
Newtown Square, PA 19073
Phone: 1-800-733-3626 or
610-436-4314

E-mail : info@atmos-technologies.com
Website: www.atmos-technologies.com

Emergency telephone number (with hours of operation) : CHEMTREC 800 424 9300

Section 2. Hazards identification

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture : Not classified.

GHS label elements

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Proprietary Surfactant.

Other means of identification : Aqueous anionic surfactant mixture.

CAS number/other identifiers

CAS number : Not available.

Product code : Not available.

Ingredient name	Other names	%	CAS number
Proprietary Surfactant.	-	100	-

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
sulfur oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 6. Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Clear viscous liquid.]

Color : Translucent. White.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : Not available.

Boiling point : 99°C (210.2°F)

Flash point : Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not applicable.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 3.3 kPa (25 mm Hg) [room temperature]

Vapor density : Not available.

Relative density : 1.01 to 1.06

Solubility : Easily soluble in the following materials: cold water and hot water.

Solubility in water : Easily soluble.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Keep away from heat.

Incompatible materials : No specific data.

Hazardous decomposition products : Low levels of sulfur oxides on exposure to high temperatures (concentrate).

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Conclusion/Summary : Not expected.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Section 11. Toxicological information

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

United States

Section 12. Ecological information

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be rinsed and recycled. If recycling is not an option, dispose of waste containers according to local regulations. Empty containers or liners may retain some product residues, which should be rinsed before disposal. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Additional information	-	-	-

Special precautions for user : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **United States inventory (TSCA 8b)**: Not determined.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Not applicable.

Composition/information on ingredients

No products were found.

SARA 313

Not applicable.

State regulations

Massachusetts : This material is not listed.

New York : This material is not listed.

New Jersey : This material is not listed.

Pennsylvania : This material is not listed.

California Prop. 65

None of the components are listed.

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

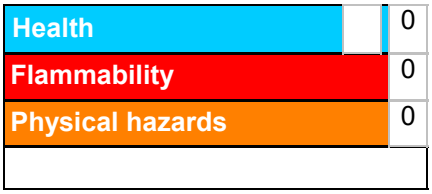
UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

United States

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
Not classified.	

History

Date of issue/Date of revision : 11/23/2020

Date of previous issue : No previous validation

Version : 1

Prepared by : IHS

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Section 16. Other information

References : HCS (U.S.A.)- Hazard Communication Standard
International transport regulations

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Technical Data Sheet

ATMOS

PNEUMATIC FOAM UNIT 400/25

Atmos Technologies completely self-contained and portable foam generating system designed to withstand the rugged demands and harsh elements found at remediation sites. Quick start-up time means that emission control is available when you need it. Recommended for small to medium size remediation projects, dredging operations and hazardous waste sites.

Can be towed around site with a pick-up truck. Foam is applied using a hand-line.

System includes air compressor, pump, hoses, nozzles, solution storage tank and proprietary foam generating technology. Unit has freeze protection for outdoor storage year-round.

Features

- Simple to operate
- No clean-up necessary
- Durable, rugged construction
- Can be filled and placed aside until needed

Specifications

- Solution Storage Tank.....400 Gallons
- Coverage Rate.....270 Sq. Ft./Min. @3" depth
- Coverage Area per fill.....2,000 - 6,000 Sq. Ft.
- Size.....16'8" L x 8'6" W x 7'8" H
- Dry Weight.....6,880 Pounds
- Hose.....200 Feet of 1-1/2" Diameter
- Products.....All Long Duration and Soil Equivalent Foam Products
- Freeze Protection System.....120V or 230V, 30 amp, single phase

ATMOS
Pioneering Environmental Solutions

17 Campus Boulevard, Suite 100
Newtown Square, PA 19073
Phone: 610-436-4314
atmos-technologies.com

bektra™

Performance Advantages

Bio-Key 880I combines Bektra’s newest odor inhibiting technologies in a formula maximizing at source neutralization and long term effectiveness.

COMMON AREA OF USE:

Grit and screenings
Settling ponds
Dewatered sludge
Leachate

BIO-KEY 880I Water Mint

Injectable Odor Neutralizer

Bio-Key 880I is an injectable odor neutralizing concentrate that actively neutralizes existing offensive odors and contains natural bio-stimulants and probiotics to deactivate odor producing mechanisms. The patented, non-aldehyde, odor elimination technology has been optimized for reducing amines, terpenes and thiols for a broad range of wastewater applications from grit and screening and wastewater settling ponds to biosolids.

SPECIFICATIONS:

Appearance: Thin brown liquid, some settling may occur
Odor: Slight with product specific key notes
Flash Point (CC): Not applicable
Freezing Point (°C): 0°C / 32°F

DIRECTION FOR USE:

Bio-Key 880I is injected directly into the wastewater or sludge. Recommended at 10 - 60 ppm for wastewater, 20 - 100 ppm for dewatered sludge.

PACKAGING:

BKT880I-0020	20L	(5.3 gal pail)	22kg.	(48 lbs.)
BKT880I-0200	200L	(53 gal drums)	216kg.	(476 lbs.)
BKT880I-1000	1000L	(264 gal tote)	1076kg.	(2370 lbs.)

STORAGE & HANDLING:

Keep out of reach of children. Product is intended for industrial use only. Keep container closed when not in use. Wear protective goggles and gloves when transferring or handling product. Protect from freezing. Do not store in areas of high temperature or direct sunlight.

bektra.com

220 Bayview Drive, Unit 7
Barrie, ON L4N 4Y8
705-734-2422

SAFETY DATA SHEET

Bio-Key Injection Blend Odor Control

1. Identification

1.1 Product identifier

Product Name	Bio-Key Injection Blend Odor Control, all varieties
Product Code	BKI 880 Water Mint

1.2 Recommended use of the chemical and restrictions on use

Recommended for:	Wastewater Odor Control
Not recommended:	In food areas of food processing facilities

1.3 Details of the supplier of the safety data sheet

Manufacturer	Bektra Corp 220 Bayview Drive, Unit 7 Barrie, ON L4N 4Y8
Information	705-734-2422
24 Hour Emergency Telephone Number	CANUTEC 613-996-6666

2. Hazard Identification

Classification of the substance or mixture

Health hazards: Skin Irrit. 4 - H315 Eye Irrit. 4 - H320

Label elements

Signal word: Warning

Hazard statements: H316+H320 Causes mild skin and eye irritation.

Precautionary statements:
P233 Keep container tightly closed.
P264 Wash hands thoroughly after handling.
P265 Do not touch eyes.
P280 Wear protective gloves/eye protection.
P302+P352 IF ON SKIN: Wash with plenty of water.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
P403+P235 Store in a well-ventilated place. Keep cool.
P501 Dispose of contents/ container in accordance with local regulations.

Other hazards: This product does not contain any substances classified as PBT or vPvB.

SAFETY DATA SHEET

Bio-Key Injection Blend Odor Control

3. Composition/information on ingredients

Mixtures

Chemical Name	CAS number	Concentration (% w/w)
Plant extracts	N/A	10-30 %
Alcohols, C11-14-Iso-, C13-Rich, Ethoxylated	78330-21-9	<1 %
2,4-Hexadienoic Acid, Potassium Salt	590-00-1	<1%

The specific chemical identities of some ingredients in this mixture are considered to be trade secrets and are withheld in accordance with the provisions of 1910.1200 of the Code of Federal Regulations.

4. First-aid measures

Description of first aid measures

General information	Get medical attention if any discomfort continues. Show this Safety Data Sheet to medical personnel.
Inhalation	Provide fresh air. Call a physician if symptoms develop of persist.
Ingestion	Rinse mouth thoroughly with water. Give a few small glasses of water or milk to drink. Do not induce vomiting unless under the direction of medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.
Skin contact	Wash skin thoroughly with soap and water. If skin irritation occurs: get medical advice/attention. Take off contaminated clothing and wash before reuse.
Eye contact	Rinse with water. Remove contact lenses if present and easy to do so. Continue rinsing for at least 15 minutes. Consult an ophthalmologist if necessary.
Protection of first aiders	No special measures required.
Most important symptoms and effects, both acute and delayed	There are no known typical symptoms or effects.

5. Fire-fighting measures

5.1 Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2). No special requirements
5.2 Special risks of the material/mixture	No special risks
5.3 Information about fire fighting	The extinguishing agent should be chosen according to the primary cause of fire. No unusual fire or explosion hazards noted.

6. Accidental release measures

6.1 Personal precautions, protective equipment	Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. For personal protection, see section 8 of the SDS

SAFETY DATA SHEET

Bio-Key Injection Blend Odor Control

and emergency procedures	
6.2 Measures for environmental protection	Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains or water courses. Rinsing spills into municipal wastewater treatment systems is appropriate.
6.3 Procedure to stop spillage and measures for cleaning	Never return spills to original containers for re-use. Large spills: stop the flow of material, if this is without risk. Dike the spilled material where possible. Absorb in vermiculite, dry sand or earth and place into containers if rinsing into municipal wastewater treatment systems is not possible.

7. Handling and storage

7.1 Notes for safe handling	Do not taste or swallow. Avoid contact with the skin, eyes, and clothing. Wear adequate personal protection and observe good industrial hygiene practices. When using, do not eat, drink, or smoke. Wash hands thoroughly after handling. Avoid release to the environment.
7.2 Notes for safe storage	Keep container closed between uses and protected from extremes in heat and cold.
7.3 Specific end use	No specific instructions

8. Exposure Controls/personal protection

8.1 Parameters to be controlled: no exposure limits noted for ingredients.

8.2 Limitation and controlling of the exposition

Personal Protective equipment


Respiratory protection	No specific recommendations.
Eye/face protection	Wear safety glasses with side shields to protect against eye contact.
Hand protection	Wear suitable protective gloves in order to minimize skin contact.
Other skin and body protection	Wear appropriate clothing to prevent repeated or prolonged skin contact.
Hygiene measures	Wash hands thoroughly after handling. Wash at the end of each work shift and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

SAFETY DATA SHEET

Bio-Key Injection Blend Odor Control

Appearance	Water-thin liquid
Color	brown
Odor	Characteristic
Odor threshold	No information available
pH	4-5
Melting point	Not applicable
Initial boiling point and range	212F (100C)
Flash point	>201F (>93 C) closed cup
Evaporation rate	Not applicable
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits	No information available.
Vapor pressure	No information available.
Vapor density	Not applicable
Specific Gravity @25C	~1.01
Solubility(ies)	Complete in water
Partition coefficient	No information available
Auto-ignition temperature	No information available
Decomposition Temperature	No information available

10. Stability and Reactivity

Reactivity	This product is non-reactive under normal conditions of use, storage, and transport.
Stability	This product is stable under normal conditions of use, storage, and transport.
Possibility of hazardous reactions	When handled and stored as directed, no dangerous reactions occur
Conditions to avoid	Protect from freezing and excessive heat. Do not dilute prior to use.
Materials to avoid	Strong oxidizing agents.
Hazardous decomposition products	Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include the following substances: sulfur dioxide and oxides of sulfur

SAFETY DATA SHEET

Bio-Key Injection Blend Odor Control

11. Toxicological Information

Information on likely routes of exposure:

Inhalation	No adverse effects due to inhalation are expected
Skin contact	May cause skin irritation
Eye contact	May cause eye irritation
Ingestion	May be irritating, cause indigestion and diarrhea if swallowed. Expected to be a low ingestion hazard.
Information on toxicological effects:	
Skin corrosion/irritation	May cause skin irritation
Serious eye damage/eye irritation	May cause eye irritation
Respiratory or skin sensitization:	
Respiratory sensitization	Not available
Skin sensitization	Not expected to cause skin sensitization
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic
Carcinogenicity	This product is not considered to be a carcinogen by IARC,ACGIH, NTP, or OSHA.
Reproductive Toxicity	Not applicable
Specific target organ toxicity – single exposure	Not applicable
Specific target organ toxicity – repeated exposure	Not applicable
Aspiration hazard	Not applicable

12. Ecological Information

Ecotoxicity	Not applicable
Persistence and degradability	Readily biodegradable
Bioaccumulative potential	Not applicable
Partition coefficient	No information available.
Mobility in soil	No data available
Other adverse effects	None known.

13. Disposal considerations

General information

Disposal methods	Dispose of contents/container in accordance with local/regional/national/ international regulations. Triple rinse empty containers and take them to an approved waste handling site for recycling or disposal.

SAFETY DATA SHEET

Bio-Key Injection Blend Odor Control

14. Transport information	
UN Number	Not regulated
Proper UN shipping name	Not regulated
Transport hazard classes	Not regulated
Packing group	Not regulated
Environmental Hazards	Not relevant

15. Regulatory information

This product is not hazardous as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200

Canada – DSL/NDSL: All the ingredients are listed or exempt.

US – All ingredients are listed on the Toxic Substances Control Act (TSCA) Inventory

16. Other information

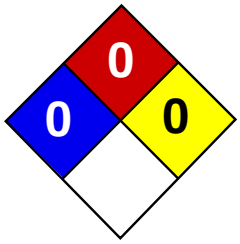
Revision comments SDS Review

Revision date 2023-04-07

Revision 1

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy themselves as to the suitability of such information for their own particular use.

Odor-No-More®
www.OdorNoMore.com



Health	0
Fire	0
Reactivity	0
Personal Protection	B

Safety Data Sheet
Iodine Powder, 0.00005 - 0.00025N SDS

Section 1: Chemical Product and Company Identification

Product Name: CupriDyne® Clean
Powder Iodine Chemistry

CAS#: See Section 3

RTECS: Not applicable.

TSCA: TSCA 8(b) inventory: Potassium Iodide
Copper Sulfate, Sulfamic Acid

CI#: Not applicable.

Synonym: Free Iodine Powsr

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Odor No More, Inc.
14921 Chestnut St.
Westminster, CA 92683

US Sales: **1-949-643-9540**
International Sales: **1-949-643-9540**

Order Online: info@odornomore.com

24HR Emergency Telephone, call:
1-949-295-3622
For non-emergency assistance, call: 1-949-643-9540

Section 2: Hazards Identification

Potential Acute Health Effects: DIlute
Non-hazardous in case of skin contact, of eye contact, of ingestion, of inhalation.

Potential Chronic Health Effects: Dilute
Non-hazardous in case of skin contact, of eye contact, of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not Avaiable

Section 3: Composition and Information on Ingredients

Composition:

Ingredient	CAS#	Percent	Hazardous
Copper Sulfate	7758-99-8	<31%	No
Potassium Iodide	7681-11-0	<47%	No
Inert Proprietary Ingredients		<23%	No

Toxicological Data on Ingredients: Iodine: ORAL (LD50): Acute: 14000 mg/kg [Rat]

Section 4: First Aid Measures

Eye Contact: Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not breathe excess gas/fumes/ vapour/spray. Avoid contact with skin. Wear suitable protective clothing. If you feel unwell, seek medical attention and show the label when possible.

Storage:
No specific storage is required. Use shelves or cabinets sturdy enough to bear the weight of the chemicals. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection: Safety glasses. Lab coat. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
Iodine CEIL: 0.1 (ppm) from ACGIH (TLV) CEIL: 1 (mg/m3) from OSHA Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: White and blue powders.

Odor: Not available.

Taste: Not available.

Molecular Weight: Not applicable.

Color: White and Blue

pH (1% soln/water): Not Applicable

Boiling Point: The lowest known value is 100°C (212°F) (Water).

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: Weighted average: Not Applicable

Vapor Pressure: The highest known value is 17.535 mm of Hg (@ 20°C) (Water).

Vapor Density: The highest known value is 0.62 (Air = 1) (Water).

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, acetone.

Solubility:
Easily soluble in cold water, hot water. Soluble in diethyl ether. Partially soluble in methanol, acetone.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Slightly reactive to reactive with oxidizing agents, combustible materials, organic materials, metals, acids.

Corrosivity:
Slightly corrosive to corrosive in presence of aluminum, of zinc, of copper. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not Available

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
DEVELOPMENTAL TOXICITY: Not Available

Other Toxic Effects on Humans: Non-hazardous in case of skin contact, of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not Available

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous degradation products are not likely.

Toxicity of the Products of Biodegradation: Not available.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Iodine;
Massachusetts RTK: Iodine, TSCA 8(b) inventory: Iodine; Water

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):

DSCL (EEC):
This product is not classified according to the EU regulations.

HMIS (U.S.A.): No SIgnificant Health Risk.

Health Hazard: 0

Fire Hazard: 0

Reactivity: 0

Personal Protection: b

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 0

Reactivity: 0

Specific hazard: 0

Protective Equipment:
Gloves. Lab coat. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 05/28/2015 4:00 AM

Disclaimer:

Odor No More, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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HEXA-COVER®

Hexa-Cover A/S • Vilhelmsborgvej 5 • DK-7700 Thisted • TEL + 45 96 17 78 00
www.hexa-cover.com • info@hexa-cover.dk

HEXA-COVER®

The unique and patented Hexa-Cover® Floating Cover is perfect on almost any form of fluid surface and is the ideal solution for controlling such things as:

- *Odor*
- *Heat loss*
- *Evaporation*
- *Emission*
- *UV effect*
- *Organic growth*

Further, the Hexa-Cover® Floating Cover deters unwanted waterfowls from landing on covered waters (what significantly reduces sedimentation, risk of E. coli).

Since its launch in 2004, Hexa-Cover® Floating Cover has been chosen for a vast number of installations globally, making the Hexa-Cover® Floating Cover the market leading solution.

Today Hexa-Cover® Floating Cover is used on almost all forms of basins, lagoons, reservoirs, containers, ponds and tanks.

Hexa-Cover®:
- Is the solid, robust and long lasting solution
- Has no weak spots, no blow- / injection holes
- Has no hollow areas (that eventually will break)
- Withstand rain, snow and frost
- Has no openings (that eventuelly will clog due to sand, debris, algae etc.)

Tested by DLG, Testzentrum, Germany

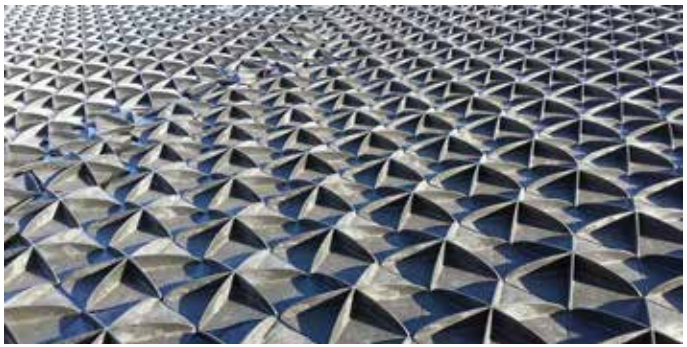
The applications are many and include among others:

Water:
- Wastewater
- Raw - / drinking water
- Cooling- and processwater
- Recovery water
- Irrigation water
- Tailings Ponds
- ILS, PLS, Refino

Industry:
- Leachate
- Decoction
- Chemicals

Oil & Gas:
- Spill-over tanks
- Emergency tanks
- Frac Water tanks
- Boil Feed Water

Agriculture:
- Storage tanks at i.e. Biogas Plants
- Manure and slurry tanks, lagoons etc.

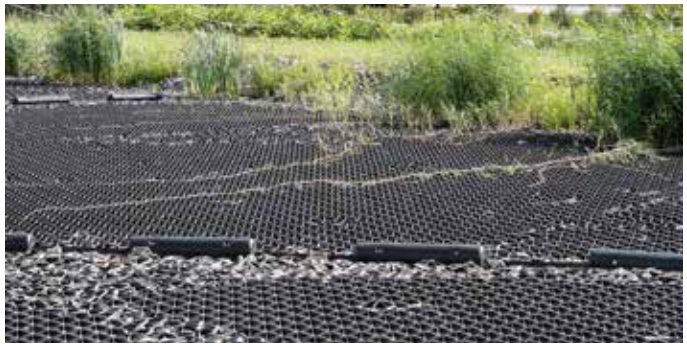


Certified for use with potable water according (AS/NZS 4020:2018)

HEXA-COVER®

Hexa-Cover® Floating Cover ensures;

- Up to 99% coverage of the surface area
- Up to 95% reduction of evaporation
- Up to 96% reduction of emission
- Up to 96% reduction of odor
- Noticeable reduction in organic growth
- Heat loss / heatflux reduced by 74%)



Hexa-Cover® Floating Cover is manufactured of recycled Polypropylene and is the solid and robust solution offering a long lifespan free of maintenance, service and repair.

Hexa-Cover® has no inside water as this *creates risks for cracks meaning the inside water will ecape the elements and enter into the covered fluid, this can potentially pollute / change the balance of the covered fluid.*

Hexa-Cover® Floating Cover - Features & Benefits:

- Ease of installation
- Installation in both full and empty tank
- Automatic distribution on the fluid surface
- Automatic adaption to changes in the level
- Fits to all shapes and geometries
- Easy adaption to changes in surface area
- Unlimited access to the liquid
- Favorable cost
- No running cost
- No repair cost
- No maintenance cost
- Needs no supervision
- Unaffected by rain, snow and frost
- Allows use of aeration
- Favourable price
- 10 years warranty
- 25 years expected lifetime

Hexa-Cover® Floating Cover - in two sizes:

Hexa-Cover® Floating Cover R90	
Diagonal measure	18,0 cm
Height	5,0 cm
Weight	0,120 kg
Weight per m2	5,2 kg
Pcs per m2	43
Big Bag	1,0 x 1,3 x 2,5 m
Surface area	50 m2
Weight	265 kg

Hexa-Cover® Floating Cover R114	
Diagonal measure	22,8 cm
Height	7,0 cm
Weight	0,243 kg
Weight per m2	6,8 kg
Pcs per per m2	28
Big Bag	1,0 x 1,3 x 2,5 m
Surface area	40 m2
Weight	275 kg

Certified for use with potable water according (AS/NZS 4020:2018)

HEXA-COVER®

Hexa-Cover®
Big Bag delivery and installation:

Hexa-Cover®
Big Bag delivery and installation:

Hexa-Cover®
Also installation in empty tank (max 5m drop)

Hexa-Cover®
BULK delivery and installation:

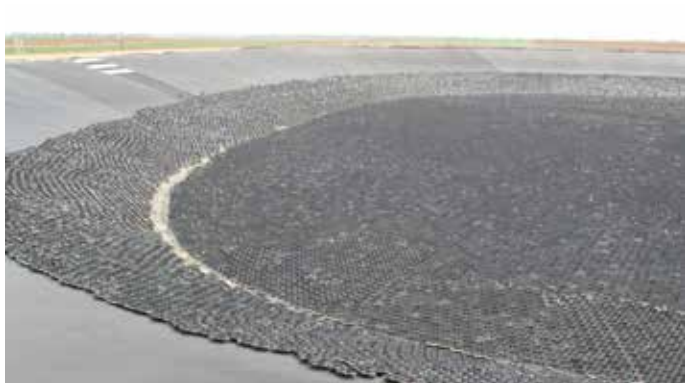
Hexa-Cover®
BULK delivery and installation:

Hexa-Cover®
Automatic adaption to changes in the level

Certified for use with potable water according (AS/NZS 4020:2018)

HEXA-COVER®



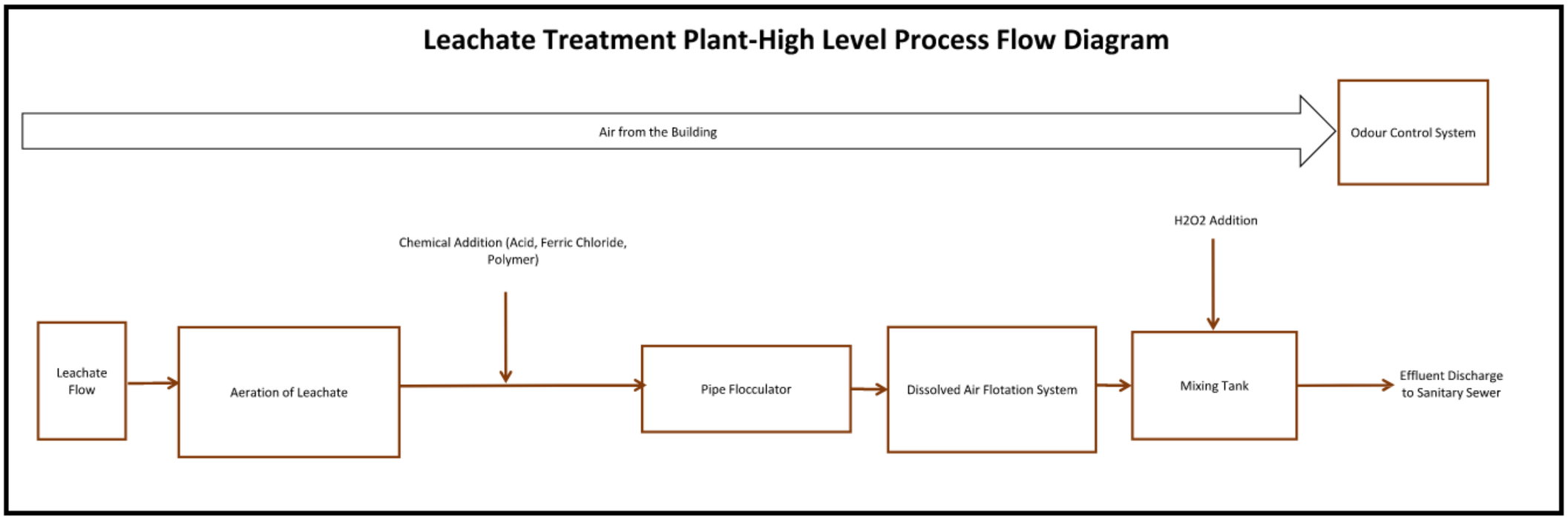
For more information

Hexa-Cover A/S • Vilhelmsborgvej 5 • DK-7700 Thisted• TEL +45 96 17 78 00
www.hexa-cover.com • info@hexa-cover.dk

Certified for use with potable water according (AS/NZS 4020:2018)

Attachment 4

Draft Process Flow Diagram for Long-Term Leachate Treatment System



Process Flow Diagram for Long Term Leachate Treatment Process

455 Phillip Street, Unit 100A Waterloo, Ontario N2L 3X2
Canada
ghd.com

Our ref: 11103232

October 13, 2023

Tamara Posadowski
Ministry of the Environment, Conservation and Parks
Hamilton District Office
119 King St W
Hamilton, ON L8P 4Y7

Response to MECP Information Request Following Review of Odour Mitigation Letter (GHD, September 21, 2023)

Dear, Tamara Posadowski,

This letter has been prepared in response to an additional information request received from the MECP regarding odour mitigation measures being implemented at the GFL Stoney Creek Regional Facility. This letter provides responses to the follow-up questions that were submitted via email on October 5, 2023. To facilitate your review, the MECP’s questions/comments have also been included below in *italics*.

Mitigation Measures

1. *Provide an update on the use of the foam surfactant.*
   a. *What procedures are in place for application?*

      The foam concentrate is stored on-Site in totes. Prior to application, the foam concentrate is mixed with water in a storage tank on a tow-behind pneumatic foam unit (PFU). The PFU is towed to areas of the Site where the foam will be applied. The foam is applied manually using a hose and nozzle.

   b. *How are specific areas being prioritized?*

      Foam is applied directly to the areas with exposed leachate: the leachate collection blanket in the north of the active cell and the leachate lagoon in the west landfill. Foam is applied until all exposed leachate has been covered.

   c. *Does GFL anticipate it will be able to maintain foam coverage on the exposed leachate and treated leachate pond? If not, why?*

      GFL has been able to maintain foam coverage of the exposed leachate. However, the foam dissipates quickly necessitating daily re-application.

   d. *How will GFL assess the efficacy of this mitigation measure? Assessing the volume of complaints over a short period of time may not provide useful information*.

      The efficacy of the foam is routinely monitored by on-site staff as part of daily operations and maintenance activities. Odours are assessed both before and after application of the foam to determine whether adequate mitigation has been achieved.

2. *Feedback provided by GFL to-date indicates limited success with the use of the foam surfactant to mitigate odours. What is the contingency plan or next steps to mitigate odour emissions?*

   Leachate is currently being treated at the Interim Leachate Pumping Station (ILPS) through the addition of ferric chloride and aeration prior to being discharged to the leachate lagoon. A dosing port

→

has also been added to the outlet of the ILPS to add hydrogen peroxide to further treat the leachate. GFL is also preparing to add hydrogen peroxide to the Permanent Leachate Pumping Station to treat the leachate in-situ prior to being pumped to the ILPS.

3. *There are very strong odour emissions coming from the biofilter and these odours are being detected off-site.*
   a. *How is GFL / GHD monitoring and assessing the effectiveness of this unit?*

      The effectiveness of the biofilter is being monitored daily by on-site staff. Hydrogen sulphide readings are being measured using a handheld unit.

   b. *Is it a feasible solution based on GFL / GHDs assessment of its performance to-date?*

      The biofilter has shown some success in mitigating odours, however it is not an effective long-term solution as it is not airtight and cannot adequately treat all of the air being recovered from the ILPS. When the odour load exceeds the capacity of the biofilter there is a possibility of odours escaping. Current chemical dosing levels are being adjusted and additional chemical dosing is being added at other locations to reduce the odour load and optimize system operation.

   c. *Are other options being explored to address odours from this source?*

      The use of a carbon air filtration unit is currently being explored to address odours from this source.

4. *By **November 15, 2023**, GFL shall conduct an odour assessment of the Stoney Creek site. At a minimum, this assessment should provide an odour emissions inventory that details each potential odour source at the site (i.e. exposed leachate, exhausts serving the leachate treatment system, leachate pond, etc.), the odour emission potential, and measures in place to control or minimize odours from each source. This exercise should include an assessment of the efficiency of any pollution control measures (i.e. determine the efficacy of the biofilter).*

   An odour assessment will be conducted at the SCRF by November 15, 2023.

5. *GFL ceased the removal of raw leachate from the site via tanker truck as of September 22, 2023. Ministry staff had requested that GFL seek to increase the volume of trucks removing raw leachate from the site to speed up the draw down of leachate. Removal of leachate by tanker truck for treatment by a licenced receiver needs to commence again as soon as practicable.*
   a. *What progress has been made to get the removal of raw leachate by tanker truck operational again?*

      Additional samples of the raw leachate have been collected and provided to the receiver for further review and testing of hydrogen sulphide levels. Discussions are on-going with the receiving facility to recommend the removal of leachate by tanker truck.

   b. *When does GFL anticipate that this process will recommence?*

      Until loads can be shipped and received in a safe manner, GFL cannot commit to a commencement date.

   c. *GHD indicates in their report that October 6 is the estimated date in which there will no longer be exposed (raw) leachate on-site. How is this estimate impacted given that the ~200,000 litres / day of raw leachate is no longer being removed by tanker truck?*

      With no leachate being removed by tanker truck, the timeline for removing exposed leachate from the liner has been prolonged. With the continued disposal of leachate through the sanitary sewer and the placement of cover materials on the blanket, it is estimated that there will no longer be exposed leachate after October 20, 2023.

Leachate Levels, Current Condition and Progress To-Date

6. *Only quarterly data has been provided in regard to analytical results for raw leachate analysis. Has GFL / GHD conducted any additional analysis of the leachate?*
   a. I*f so, please provide this data to the MECP. City of Hamilton sewer by-law (No. 14-090) includes limits for contaminant discharges to the sanitary system. These limits include sulphide (expressed as H2S) and CBOD. Final effluent data provided does not include these parameters.*

Data collected in accordance with the sewer use agreement with the City of Hamilton for the period of February 2015 through November 2022 is provided as Attachment 1 for your reference. The sewer use by-law did not include sulphide until 2022 and so the data prior to 2022 does not include sulphide analysis. As this sampling is only required annually, there is currently only one result available for sulphide in the sewer discharge data. The sulphide concentration in this sample was 0.046 mg/L (November 2022). BOD results are also included in this dataset.

b. *There does not appear to be any analytical data for H2S, sulphide expressed as H2S or ammonia. Only total sulphate (SO4) data is provided. Has there been no sulphur compound speciation or ammonia analysis?*

Raw leachate or sewer discharge samples were not historically submitted for analysis of sulphide. Sewer discharge samples have not historically been sampled for ammonia. In light of the current concerns regarding leachate-related odours, GFL has commenced sampling for sulphide and ammonia daily in both raw leachate and sewer discharge samples. It is GHD’s opinion that this additional analytical data will help inform decisions concerning the source of odours and options for a suitable remedy.

c. If so, please provide this data.

Refer to Attachment 1.

d. Sulphate concentrations measured in the raw leachate in June and Sept 2023 do not appear to be significantly different from Nov 2018 and Nov 2019. Please have your qualified consultant provide their professional opinion on why the 2018 and 2019 sulphate values are similar but there were no odour concerns at that time.

The reason for the difference in odour concerns between 2018/2019 and 2023 is not known. The additional data collection referenced above is being undertaken for the purpose of diagnosing the source and determining options for a suitable remedy.

*7. What is the current volume of **total** leachate at the site?*

The total volume of leachate at the site is currently estimated to be 93,000,000 L.

a. How are leachate levels measured, and how often are measurements collected?

Leachate levels are measured at the Permanent Leachate Pumping Station (PLPS) at the low point of the landfill as well as two leachate monitors located further upgradient in the landfill. Measurements are collected daily at the PLPS and the leachate monitors.

b. Is there continuous monitoring of leachate levels at this site?

Leachate levels are not continuously monitored but are measured manually on a daily basis as noted above.

8. Have a qualified third provide an acceptable leachate head for the landfill and discuss what measures will be implemented to maintain this level (redundant pumps within the pumping station, etc.).

It is recommended to limit the level of standing leachate on the liner to 0.5 m at any one time to be consistent with the design and operating concept. Pumps are currently installed in both the PLPS and the ILPS, providing redundancy in the system. In addition to the daily monitoring of leachate levels, the application of final cover over a large portion of the exposed waste will significantly reduce leachate generation.

9. Provide an estimate of how long it will take to reduce leachate levels to the target level identified in #8 above. This assessment should include several scenarios including:

a. Calculation based on current pumping rates

Based on the current pumping rate of 100 gpm it will take approximately 171-days of continuous discharge to the sanitary sewer to remove all leachate from the site.

b. Current pumping rates plus projected tanker truck removal volumes

If the removal of leachate by tanker truck can be resumed at a rate of 200,000 L/day, then the timeline presented in a. above will be reduced to 126-days.

c. *Projected pumping rates if the leachate system can achieve its previous pumping rate volumes (~255 GPM)*

If the pumping rate can be increased to 250 gpm it will take approximately 68-days of continuous discharge to the sanitary sewer to remove all leachate from the site.

10. *Provide MECP with weekly updates detailing the volume of leachate at the site, volume removed from the site over the week, and method and location of disposal.*

Weekly updates will be provided with the requested information every Thursday starting October 19, 2023.

11. *By **December 1, 2023**, have a qualified third party generate a leachate assessment report which includes, but is not limited to, the following:*

a. A table summarizing the annual leachate generation and actual volumes removed for the past 5 years. Also provide annual leachate head in the active face over past 5 years.

b. A graphic / chart showing the annual leachate surplus / deficit and assess the cause for the leachate surplus for this period.

c. A review of the predicted leachate generation for the site.

d. *A technical assessment to e*valuate the leachate levels and their potential to:

i. Cause odours (i.e. at what level is it expected that there will be minimal odour generation due to leachate and more normal levels of TRS compounds)

ii. Cause leachate seeps

iii. Reduce the liner service life

iv. *Cause im*pacts to groundwater due to increased leakage

e. A plan that discusses how GFL will reduce the generation of leachate at the site moving forward (for example, increased final cover installation frequency, a revised fill sequencing plan, additional berms to separate clean stormwater from the active face, a revised landfill cover design, etc.). This plan will need to evaluate several options and their benefits, along with a discussion on the current vs proposed operations for each of the options.

A Leachate Assessment Report is currently being prepared and will be submitted by December 1, 2023.

Leachate Treatment

12. *Provide a chart / timeline detailing the dates and additional details pertaining to the changes that were made to the leachate treatment process.*

a. When did GFL switch to using ferric chloride for treating leachate?

GFL switched to using ferric chloride on July 26, 2023.

b. What dosage rates have been used?

Dosage rates have ranged from 11.39 mL/min to 68.33 mL/min. Rates were adjusted based on conditions such as pumping rate, pumping location, and odours.

c. What additional chemicals were used to treat raw leachate (i.e., ferric sulphate) and in what quantities? Was this effective?

GFL used ferrous sulphate to “shock” the exposed leachate on the blanket in three to four areas using one full 1000 L tote in each area. Ferrous sulphate was added to the leachate collection blanket periodically between August 9, 2023 and September 15, 2023. The use of ferrous sulphate ceased after this date as it proved to not be effective at mitigating odours.

d. *The report states that GFL continues to evaluate the effectiveness of the treatment and adjusts the chemical dosage rates to optimize treatment. What are the variables used to assess efficacy and evaluate effectiveness?*

Hydrogen sulphide concentrations and the presence of odours are the main variables used to optimize the leachate treatment system. These are measured at various locations including the leachate pumping source (before treatment), the ILPS (during treatment), and the leachate lagoon (post-treatment). Bench testing of the leachate also assesses the reaction time and hydrogen sulphide levels based on the chemical and dosage being added.

A timeline detailing changes that were made to the leachate treatment process has been provided as Attachment 2.

13. *The report states that the hydrogen peroxide that had been used for years suddenly stopped working. Have your qualified consultant provide their conclusions as to why this likely occurred and include details regarding any changes in leachate chemistry / characteristics at the GFL site.*

Based on analysis of the current and historical leachate chemistry there hasn’t been a significant change in the characteristics. There also have not been any significant changes to the types of waste being received at the SCRF. Discussions with the chemical supplier determined that the hydrogen peroxide that was being added may dissociate at elevated ambient temperatures. As such, the treatment of leachate at the ILPS was switched over to using ferric chloride. In addition, hydrogen peroxide has been re-introduced as part of the leachate treatment both pre- and post-treatment with ferric chloride.

14. *Provide clarification on the dilution of leachate with groundwater.*

a. *Is groundwater only added at the leachate pond or during the treatment process?*

Groundwater is only added at the leachate pond.

b. *What happens when there is no groundwater available, how is the process affected?*

Impacted groundwater is pumped into the leachate lagoon from recovery well M4 in the east landfill. The addition of groundwater only serves to dilute the treated leachate in the lagoon. The treatment of leachate will not be impacted when there is no groundwater available since it is not part of the treatment process. However, the concentration of the leachate being sent to the sanitary sewer will increase without the dilution provided by the addition of groundwater.

c. *Do the leachate pumping volumes being provided include the groundwater that is added to the process? If so, is there a way to distinguish them?*

The leachate pumping volumes provided only reflect the leachate recovered from the east landfill, and do not include added groundwater or leachate from the west landfill. The total leachate/groundwater discharged to the sanitary sewer is tracked separately and measured at the outlet from the leachate lagoon.

15. *We understand that GFL intends to make additional changes to the leachate treatment process. We have scheduled a technical meeting to hear about the changes that are planned. We are requesting that GHD present the recommendations they have provided to GFL, next steps regarding the leachate treatment adjustments and outline the technical assessments that guided this advice. This is intended to be a technical discussion; MECP will have its technical experts participate in the meeting.*

Technical discussion was held between GFL, MECP, and GHD on Friday, October 6.

Communication Strategy

16. *GFL should provide written notification of pending meetings to residents within 3 kilometers from the site. GFL should not solely rely on a website posting and emailing complainants that have provided contact info. Please confirm the method of written notification that GFL intends to use.*

As requested, written notification of pending meetings is being provided to all residents within 3 kilometres of the site via Canada Post unaddressed Admail.

17. *The first virtual meeting is scheduled for Oct 30. Community members should not have to wait another month to share their concerns and receive updates from GFL on the measures in place, progress made, and next steps. The MECP is requesting that the first meeting be held no later than* ***October 18****.*

    As requested, the October meeting has been rescheduled to Wednesday, October 18. Community update meetings have also been scheduled for Thursday, November 16 and Thursday, December 14.

Air Monitoring

18. *The ministry requires additional details regarding the odour and air monitoring proposed in the Sept 21, 2023, report and currently being carried out at the site.*
    a. *What parameters are being monitored?*

       Air sampling and monitoring was conducted during the week of September 25, 2023. Monitoring of speciated TRS and VOCs was conducted at both on-site and off-site locations.

    b. *How frequent will monitoring occur?*

       The proposed monitoring frequency will be detailed in the Air Monitoring Plan currently being prepared in response to Item 20 below.

    c. *Who is carrying out this sampling?*

       GHD completed this sampling.

    d. *How will the monitoring data be communicated to the MECP and the public?*

       A draft report from the September air monitoring and sampling event will be compiled by the week of October 16, 2023. Once finalized, results will be shared directly with the MECP via email, and the public via updates to the GFL SCRF website.

19. *Provide a copy of GFLs procedure document for responding to odour complaints. This should include details of the procedures for odour surveys, data collection, and response procedures to share information with the complainants.*

    GFL’s procedure for responding to odour complaints has been provided in Attachment 3.

20. *By* ***October 20, 2023****, have a qualified third party develop and submit an air monitoring plan to the ministry detailing a proposal for an ambient air monitoring program at GFL. The air monitoring program shall include, but not be limited to:*
    a. *Continuous monitoring for TRS and ammonia.*
    b. *Odour monitoring on-site and in the surrounding community.*

       An Air Monitoring Plan is currently being developed and will be submitted by October 20, 2023.

We trust that the above information adequately addresses the current concerns regarding odours from the Site. GFL remains committed to working with all stakeholders to resolve the odour issue as quickly as possible and will continue to keep the community informed of mitigation activities and address questions and concerns as they arise.

Regards,

Brian Dermody, P.Eng.
Senior Engineer

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Attachments

Attachment 1

WQ Annual City Discharge Permit

GFL - STONEY CREEK REGIONAL FACILTY MONTHLY ANALYTICAL TEST RESULTS HAMILTON SEWER USE BY-LAW (22-103)	Hamilton Sewer Use By-Law	RESULTS 24-Feb-15	RESULTS 24-Mar-15	RESULTS 23-Apr-15	RESULTS 20-May-15	RESULTS 23-Jun-15	RESULTS 28-Jul-15	RESULTS 24-Aug-15	RESULTS 22-Sep-15	RESULTS 30-Oct-15
Calculated Parameters	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Animal/Vegetable Oil and Grease	150	6.3	2.3	4.9	2.6	3	2.3	5.1	1.4	10
Inorganics	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Biochemical Oxygen Demand BOD (5)	300	110	41	37	45	77	65	140	62	52
Fluoride (F-)	10	3.3	1.6	1.9	2.2	2.2	2.9	3.2	2.3	2.1
Total Kjeldahl Nitrogen (TKN)	100.0	190	66	72	83	77	120	120	80	69
pH	6.0-11.0	7.8	7.81	7.4	7.93	7.81	7.67	7.95	7.8	7.81
Phenols-4AAP	1.0	0.85	0.19	0.36	0.028	0.016	0.03	0.04	0.022	0.015
Total Suspended Solids (TSS)	350	35	12	14	39	140	100	100	97	70
Sulfate (SO4)	1500	570	480	700	790	700	710	710	790	780
Sulphide (as H2S)	1									
Cyanide (Total CN-)	2	0.28	0.085	0.13	0.083	0.073	0.15	0.14	0.091	0.11
Chloride (Cl-)	1500	3100	1200	1400	1700	1500	2000	2100	1600	1500
Petroleum Hydrocarbons	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Oil & Grease	150	6.3	2.3	4.9	2.6	3	2.3	5.1	1.4	10
Total Oil & Grease Mineral/Synthetic	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.9
Metals	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Aluminum (Al)	50.0	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Total Antimony (Sb)	5	0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Arsenic (As)	1	0.2	<0.2	0.05	0.06	0.06	0.1	0.1	0.08	0.05
Total Bismuth (Bi)	5.0	0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	0.7	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Chromium (Cr)	5.0	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Cobalt (Co)	5.0	<0.02	<0.02	0.00	0.003	0.003	0.004	0.004	0.003	0.003
Total Copper (Cu)	2.0	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Iron (Fe)	50.0	0.94	0.70	0.1	0.33	0.35	0.58	0.47	0.4	0.62
Total Lead (Pb)	2.0	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Manganese (Mn)	5.0	0.27	0.15	0.17	0.24	0.15	0.16	0.15	0.15	0.29
Mercury (Hg)	0.01	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Total Molybdenum (Mo)	1.0	0.22	0.08	0.071	0.11	0.12	0.2	0.26	0.16	0.13
Total Nickel (Ni)	2.0	0.15	<0.05	0.045	0.059	0.058	0.097	0.12	0.075	0.0059
Total Phosphorus (P)	10.0	3.6	1.1	1.1	1.4	1.8	2.5	3.2	2.3	1.8
Total Selenium (Se)	1.0	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Silver (Ag)	5.0	<0.01	<0.00010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Tin (Sn)	5.0	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Titanium (Ti)	5.0	0.03	0.01	0.008	0.007	0.010	0.015	0.017	0.009	0.011
Total Vanadium (V)	5.0	0.1	0.03	0.034	0.044	0.041	0.067	0.074	0.041	0.039
Total Zinc (Zn)	2.0	<0.01	0.02	0.021	0.011	0.020	0.005	0.005	0.009	0.02
Semivolatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Di-N-butyl phthalate	80	<8	<2	<2	<20	<10	<20	<20	<20	<8
Bis(2-ethylhexyl)phthalate+	280	<8	<2	<2	<20*	<10	<20	<20	<20	<8
3,3'-Dichlorobenzidine	2	<3	<0.8	<0.8	<8**	<4*	<8	<8	<8	<3
Pentachlorophenol	5	<4	<1	<1	<10***	<5	<10	<10	<10	<4
Phenanthrene	none	<0.8	<0.2	<0.2	<2		<2	<2	<2	<0.8
Anthracene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Fluoranthene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Pyrene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Benzo(a)anthracene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8

GFL - STONEY CREEK REGIONAL FACILTY MONTHLY ANALYTICAL TEST RESULTS HAMILTON SEWER USE BY-LAW (22-103)	Hamilton Sewer Use By-Law	RESULTS 24-Feb-15	RESULTS 24-Mar-15	RESULTS 23-Apr-15	RESULTS 20-May-15	RESULTS 23-Jun-15	RESULTS 28-Jul-15	RESULTS 24-Aug-15	RESULTS 22-Sep-15	RESULTS 30-Oct-15
Chrysene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Benzo(b/j)fluoranthene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Benzo(k)fluoranthene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Benzo(a)pyrene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Indeno(1,2,3-cd)pyrene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Dibenz(a,h)anthracene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Benzo(g,h,i)perylene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Dibenzo(a,i)pyrene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Benzo(e)pyrene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Perylene	none	<0.8	<0.2	<0.2	<2	<1	<2	<2	<2	<0.8
Dibenzo(a,j) acridine	none	<2	<0.4	<0.4	<4	<2	<4	<4	<4	<2
7H-Dibenzo(c,g) Carbazole	none	<2	<0.4	<0.4	<4	<2	<4	<4	<4	<2
Calculated Parameters	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total PAHs (18 PAHs)	5	<6	<1	<1	<9.6	<4.8	<9.6	<9.6	<9.6	
Volatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	10	3.2	<2.5	<2	0.36	<2.0	<2.5	<5	0.51	<2.5
Chloroform	40	<1.0	<2.5	<2	<0.20	<2.0	<2.5	<5	<0.50	<2.5
1,2-Dichlorobenzene	50	<2.0	<5.0	<4	<0.50	<4.0	<5.0	<10	<1.0	<5.0
1,4-Dichlorobenzene	80	<2.0	<5.0	<4	<0.50	<4.0	<5.0	<10	<1.0	<5.0
cis-1,2-Dichloroethylene	4000	<1.0	<2.5	<2	<0.50	<2.0	<2.5	<5	<0.50	<2.5
trans-1,3-Dichloropropene	140	<2.0	<5.0	<4	<0.40	<4.0	<5.0	<10	<1.0	<5.0
Ethylbenzene	160	4.3	<2.5	3	1.1	<2.0	<2.5	<5	1.1	<2.5
Methylene Chloride(Dichloromethane)	2000	<5.0	<13	<10	<2.0	<10	<13	<25	<2.5	<13
1,1,2,2-Tetrachloroethane	1400	<2.0	<5.0	<4	<0.50	<4.0	<5.0	<10	<1.0	<5.0
Tetrachloroethylene	1000	<1.0	<2.5	<2	<0.20	<2.0	<2.5	<5	<0.50	<2.5
Toluene	16	94	40	46	3.1	<4.0	<5.0	<10	6.9	<5.0
Trichloroethylene	400	<1.0	<2.5	<2	<0.20	<2.0	<2.5	<5	<0.50	<2.5
p+m-Xylene	1400	10	3.9	4.7	1.9	<2.0	3.1	<5	2.6	<2.5
o-Xylene	1400	5.9	<2.5	2.6	1.4	<2.0	<2.5	<5	1.4	<2.5
Total Xylenes	1400	16	3.9	7.3	3.3	<2.0	3.1	<5	4.1	<2.5
Pesticides & Herbicides	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aldrin	0.2	<0.005	<0.005	<0.005	<0.05	<0.03	<0.005	<0.05		<0.005
Dieldrin	0.2	<0.005	<0.005	<0.005	<0.05	<0.03	<0.007	<0.05		<0.005
a-Chlordane	100	<0.005	<0.005	<0.005	<0.05	<0.03	<0.005	<0.05		<0.005
g-Chlordane	100	<0.005	<0.005	<0.005	<0.05	<0.03	<0.005	<0.05		<0.005
o,p-DDT	0.1	<0.005	<0.005	<0.005	<0.05	<0.03	<0.02	<0.05		<0.005
p,p-DDT	0.1	<0.005	<0.005	<0.005	<0.05	<0.03	<0.02	<0.05		<0.005
Lindane	none	<0.003	<0.003	<0.003	<0.03	<0.02	<0.003	<0.03		
Hexachlorobenzene	0.1	<0.005	<0.005	<0.005	<0.05	<0.03	<0.005	<0.05		<0.005
Mirex	100	<0.005	<0.005	<0.005	<0.05	<0.03	<0.02	<0.05		<0.005
Total Endosulfan	None	<0.005	<0.005	<0.005	<0.05	<0.03		<0.05		<0.005
Heptachlor + Heptachlor epoxide	None	<0.005	<0.005	<0.005	<0.05	<0.03		<0.05		
Total PCB	1	<0.05	<0.05	<0.05	<0.5	<0.3	<0.05	<2	<0.05	<0.05

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Calculated Parameters	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Animal/Vegetable Oil and Grease	150	2.8	5.3	6.4	14	2	5.8	8.4	1.9	14.0
Inorganics	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Biochemical Oxygen Demand BOD (5)	300	39	79	54	130	140	130	160	44	140
Fluoride (F-)	10	2.2	2.3	2.1	2.7	1.8	2.4	2.4	3.0	3.9
Total Kjeldahl Nitrogen (TKN)	100.0	74	98	97	140	77	110	86	120	150
pH	6.0-11.0	7.86	7.77	7.86	7.74	7.59	7.77	7.79	8.42	8.38
Phenols-4AAP	1.0	0.023	0.11	0.079	0.61	0.52	0.56	0.85	0.012	0.2
Total Suspended Solids (TSS)	350	50	40	46	25	16	27	22	170	84
Sulfate (SO4)	1500	840	840	930	740	510	530	870	510	630
Sulphide (as H2S)	1									
Cyanide (Total CN-)	2	0.095	0.12	0.11	0.17	0.12	0.18	0.19	0.092	0.23
Chloride (Cl-)	1500	1400	1700	1700	2100	1100	1300	1800	1700	2500
Petroleum Hydrocarbons	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Oil & Grease	150	2.8	5.3	6.4	14	2	5.8	9.2	1.9	14
Total Oil & Grease Mineral/Synthetic	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50
Metals	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Aluminum (Al)	50.0	0.1	0.2	<0.1	0.1	0.2	0.2	0.1	<0.1	<0.1
Total Antimony (Sb)	5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	0.02
Total Arsenic (As)	1	0.05	0.06	<0.01	0.08	0.04	0.07	0.09	0.1	0.12
Total Bismuth (Bi)	5.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	0.7	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Chromium (Cr)	5.0	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.01	0.01	0.02
Total Cobalt (Co)	5.0	0.003	0.003	<0.002	0.004	0.006	0.004	0.003	0.003	0.006
Total Copper (Cu)	2.0	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Total Iron (Fe)	50.0	0.58	0.7	0.22	0.6	0.98	0.69	1.2	0.46	0.55
Total Lead (Pb)	2.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Manganese (Mn)	5.0	0.33	0.32	0.01	0.22	0.74	0.35	0.32	0.097	0.18
Mercury (Hg)	0.01	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Molybdenum (Mo)	1.0	0.12	0.13	<0.005	0.17	0.1	0.17	0.38	0.23	0.36
Total Nickel (Ni)	2.0	0.063	0.072	<0.005	0.093	0.065	0.081	0.08	0.11	0.16
Total Phosphorus (P)	10.0	1.8	2.2	0.45	3.4	1.3	2.2	2.8	3.7	4.9
Total Selenium (Se)	1.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Silver (Ag)	5.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Tin (Sn)	5.0	<0.02	<0.02	<0.02	<0.02	0.02	0.05	<0.02	0.02	0.04
Total Titanium (Ti)	5.0	0.012	0.016	<0.005	0.024	0.023	0.039	0.018	0.037	0.059
Total Vanadium (V)	5.0	0.034	0.05	<0.005	0.057	0.042	0.059	0.04	0.074	0.11
Total Zinc (Zn)	2.0	0.045	0.046	0.01	0.009	0.052	0.039	0.016	0.015	<0.005
Semivolatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Di-N-butyl phthalate	80	<20	<8	<8	<10	<10	<8	<8	<100	<8
Bis(2-ethylhexyl)phthalate+	280	<20	<8	<8	<10	<10	<8	<8	<100	<8
3,3'-Dichlorobenzidine	2	<8	<3	<3	<4	<4	<3	<3	<40	<3
Pentachlorophenol	5	<10	<4	<4	<5	<5	<4	<4	<50	<4
Phenanthrene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Anthracene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Fluoranthene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Pyrene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Benzo(a)anthracene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8

GFL - STONEY CREEK REGIONAL FACILTY MONTHLY ANALYTICAL TEST RESULTS HAMILTON SEWER USE BY-LAW (22-103)	Hamilton Sewer Use By-Law	RESULTS 25-Nov-15	RESULTS 29-Dec-15	RESULTS 25-Jan-16	RESULTS 24-Feb-16	RESULTS 29-Mar-16	RESULTS 26-Apr-16	RESULTS 8-Jun-16	RESULTS 21-Jul-16	RESULTS 15-Aug-16
Chrysene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Benzo(b/j)fluoranthene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Benzo(k)fluoranthene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Benzo(a)pyrene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Indeno(1,2,3-cd)pyrene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Dibenz(a,h)anthracene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Benzo(g,h,i)perylene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Dibenzo(a,i)pyrene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Benzo(e)pyrene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Perylene	none	<2	<0.8	<0.8	<1	<1	<0.8	<0.8	<10	<0.8
Dibenzo(a,j) acridine	none	<4	<2	<2	<2	<2	<2	<2	<20	<0.8
7H-Dibenzo(c,g) Carbazole	none	<4	<2	<2	<2	<2	<2	<2	<20	<2
Calculated Parameters	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total PAHs (18 PAHs)	5	<9.6	<3.8	<3.8	<4.8	<4.8	<3.8	<3.8	<48	<3.8
Volatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	10	<2	<2.5	<5.0	<5.0	<5	3	<2.5	<2.5	<0.20
Chloroform	40	<2	<2.5	<5.0	<5.0	<5	<2.0	<2.5	<2.5	<0.20
1,2-Dichlorobenzene	50	<4	<5.0	<10	<10	<10	<4.0	<5.0	<5.0	<0.5
1,4-Dichlorobenzene	80	<4	<5.0	<10	<10	<10	<4.0	<5.0	<5.0	<0.5
cis-1,2-Dichloroethylene	4000	<2	<2.5	<5.0	<5.0	<5	<2.0	<2.5	<2.5	<0.5
trans-1,3-Dichloropropene	140	<4	<5.0	<10	<10	<10	<4.0	<5.0	<5.0	<0.40
Ethylbenzene	160	<2	<2.5	<5.0	6	5.1	4.5	<2.5	<2.5	<0.20
Methylene Chloride(Dichloromethane)	2000	<10	<13	<25	<25	<25	<10	<13	<13	<2.0
1,1,2,2-Tetrachloroethane	1400	<4	<5.0	<10	<10	<10	<4.0	<5.0	<5.0	<0.50
Tetrachloroethylene	1000	<2	<2.5	<5.0	<5.0	<5.0	<2.0	<2.5	<2.5	<0.20
Toluene	16	10	<5.0	<10	96	66	55	24	<5.0	<0.20
Trichloroethylene	400	<2	<2.5	<5.0	<5.0	<5	<2.0	<2.5	<2.5	<0.20
p+m-Xylene	1400	2.1	<2.5	<5.0	11	8.8	8.6	3.6	<2.5	<0.20
o-Xylene	1400	<2	<2.5	<5.0	6	<5	4.7	<2.5	<2.5	<0.20
Total Xylenes	1400	2.1	<2.5	<5.0	17	8.8	13	3.6	<2.5	<0.20
Pesticides & Herbicides	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aldrin	0.2	<0.05	<0.05	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.05
Dieldrin	0.2	<0.05	<0.05	<0.005	<0.007	<0.05	<0.005	<0.005	<0.005	<0.05
a-Chlordane	100	<0.05	<0.05	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.05
g-Chlordane	100	<0.05	<0.05	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.05
o,p-DDT	0.1	<0.05	<0.05	<0.007	<0.007	<0.05	<0.005	<0.005	<0.005	<0.05
p,p-DDT	0.1	<0.05	<0.05	<0.02	<0.01	<0.05	<0.005	<0.005	<0.005	<0.05
Lindane	none	<0.03	0.03	0.013	<0.007	<0.05	<0.003	<0.005	<0.005	<0.03
Hexachlorobenzene	0.1	<0.05	<0.05	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.05
Mirex	100	<0.05	<0.05	<0.02	<0.01	<0.05	<0.005	<0.005	<0.005	<0.05
Total Endosulfan	None	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	n/a	n/a
Heptachlor + Heptachlor epoxide	None	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	n/a	n/a
Total PCB	1	<0.05	<0.5	<0.05	<0.2	<0.05	<0.05	<0.05	n/a	n/a

GFL - STONEY CREEK REGIONAL FACILTY MONTHLY ANALYTICAL TEST RESULTS HAMILTON SEWER USE BY-LAW (22-103)	Hamilton Sewer Use By-Law	RESULTS 12-Sep-16	RESULTS 14-Oct-16	RESULTS 28-Nov-16	RESULTS 30-Dec-16	RESULTS 24-Jan-17	RESULTS 23-Feb-17	RESULTS 29-Mar-17	RESULTS 27-Apr-17	RESULTS 30-May-17
Calculated Parameters	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Animal/Vegetable Oil and Grease	150	20.0	4.8	12	5.9	8.8	3.3	14.0	0.9	4.6
Inorganics	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Biochemical Oxygen Demand BOD (5)	300	160	57	31	56	100	44	63	36	56
Fluoride (F-)	10	4.4	4.5	4.5	4.2	2.7	1.9	2.3	1.9	2.0
Total Kjeldahl Nitrogen (TKN)	100.0	160	170	260	220	140	88	110	70	65
pH	6.0-11.0	8.37	8.35	8.32	8.39	8.02	8.01	7.91	7.72	7.99
Phenols-4AAP	1.0	0.074	0.021	1.5	0.12	0.26	0.037	0.092	0.02	0.069
Total Suspended Solids (TSS)	350	76	64	57	53	50	40	62	37	43
Sulfate (SO4)	1500	670	570	570	670	760	780	720	630	650
Sulphide (as H2S)	1									
Cyanide (Total CN-)	2	0.33	0.35	0.51	0.41	0.29	0.14	0.18	0.14	0.13
Chloride (Cl-)	1500	2700	2600	2500	2800	2000	1400	1700	1200	1200
Petroleum Hydrocarbons	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Oil & Grease	150	21	4.8	13	6.6	9.9	3.3	16	6.6	4.6
Total Oil & Grease Mineral/Synthetic	15	0.6	<0.50	1.4	0.7	1.1	<0.50	1.8	0.9	1.9
Metals	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Aluminum (Al)	50.0	<0.1	<1	0.2	<0.1	<0.1	<0.1	<0.1	0.1	0.1
Total Antimony (Sb)	5	<0.02	<0.2	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Arsenic (As)	1	0.12	0.1	0.16	0.14	0.08	0.04	0.05	0.05	0.04
Total Bismuth (Bi)	5.0	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	0.7	<0.002	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Chromium (Cr)	5.0	0.02	<0.1	0.02	0.02	0.02	<0.01	<0.01	0.01	0.01
Total Cobalt (Co)	5.0	0.006	<0.02	0.006	0.006	0.005	0.003	0.003	0.002	0.003
Total Copper (Cu)	2.0	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Total Iron (Fe)	50.0	0.63	0.8	1.2	0.95	0.66	0.46	0.44	0.49	0.53
Total Lead (Pb)	2.0	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Manganese (Mn)	5.0	0.18	0.17	0.22	0.22	0.28	0.15	0.17	0.16	0.23
Mercury (Hg)	0.01	<0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Molybdenum (Mo)	1.0	0.34	0.4	0.45	0.42	0.22	0.15	0.18	0.15	0.21
Total Nickel (Ni)	2.0	0.15	0.16	0.18	0.17	0.11	0.072	0.083	0.064	0.079
Total Phosphorus (P)	10.0	4.4	4.5	5.9	6.6	3	1.9	2.3	1.4	1.6
Total Selenium (Se)	1.0	<0.02	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Silver (Ag)	5.0	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Tin (Sn)	5.0	0.04	<0.2	0.04	0.04	0.03	<0.02	0.02	0.06	0.04
Total Titanium (Ti)	5.0	0.054	0.05	0.056	0.056	0.036	0.018	0.027	0.038	0.05
Total Vanadium (V)	5.0	0.12	0.1	0.11	0.11	0.075	0.045	0.051	0.048	0.055
Total Zinc (Zn)	2.0	<0.005	<0.05	0.01	0.014	0.036	0.047	0.045	0.067	0.044
Semivolatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Di-N-butyl phthalate	80	<20	<8	<8	<20	<2	<8	<2	<2	<8
Bis(2-ethylhexyl)phthalate+	280	<20	<8	<8	<20	<2	<8	<2	<2	<8
3,3'-Dichlorobenzidine	2	<8	<3	<3	<8	<0.8	<3	<0.8	<0.8	<3
Pentachlorophenol	5	<10	<4	<4	<10	<1	<4	<1	<1	<4
Phenanthrene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Anthracene	none	<2	0.9	<0.8	<2	<0.2	<0.8	<0.2	0.6	<0.8
Fluoranthene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Pyrene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Benzo(a)anthracene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8

GFL - STONEY CREEK REGIONAL FACILTY MONTHLY ANALYTICAL TEST RESULTS HAMILTON SEWER USE BY-LAW (22-103)	Hamilton Sewer Use By-Law	RESULTS 12-Sep-16	RESULTS 14-Oct-16	RESULTS 28-Nov-16	RESULTS 30-Dec-16	RESULTS 24-Jan-17	RESULTS 23-Feb-17	RESULTS 29-Mar-17	RESULTS 27-Apr-17	RESULTS 30-May-17
Chrysene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Benzo(b/j)fluoranthene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Benzo(k)fluoranthene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Benzo(a)pyrene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Indeno(1,2,3-cd)pyrene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Dibenz(a,h)anthracene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Benzo(g,h,i)perylene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Dibenzo(a,i)pyrene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Benzo(e)pyrene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Perylene	none	<2	<0.8	<0.8	<2	<0.2	<0.8	<0.2	<0.2	<0.8
Dibenzo(a,j) acridine	none	<4	<0.8	<2	<4	<0.4	<2	<0.4	<0.4	<2
7H-Dibenzo(c,g) Carbazole	none	<4	<2	<2	<4	<0.4	<2	<0.4	<0.4	<2
Calculated Parameters	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total PAHs (18 PAHs)	5	<9.6	<3.8	<3.8	<9.6	<0.96	<3.8	<0.96	<0.96	<3.8
Volatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	10	<2.5	<2.5	<1.0	0.45	<5.0	<5.0	<5.0	<2.5	<10
Chloroform	40	<2.5	<2.5	<1.0	<0.20	<5.0	<5.0	<5.0	<2.5	<10
1,2-Dichlorobenzene	50	<5.0	<5.0	<2.5	<0.50	<10	<10	<10	<5.0	<25
1,4-Dichlorobenzene	80	<5.0	<5.0	<2.5	<0.50	<10	<10	<10	<5.0	<25
cis-1,2-Dichloroethylene	4000	<2.5	<2.5	<2.5	<0.50	<5.0	<5.0	<5.0	<2.5	<25
trans-1,3-Dichloropropene	140	<5.0	<5.0	<2.5	<0.40	<10	<10	<10	<5.0	<20
Ethylbenzene	160	<2.5	<2.5	<1.0	1	<5.0	<5.0	<5.0	<2.5	<10
Methylene Chloride(Dichloromethane)	2000	<13	<13	<10	<2.0	<25	<25	<25	<13	<100
1,1,2,2-Tetrachloroethane	1400	<5.0	<5.0	<2.5	<0.50	<10	<10	<10	<5.0	<25
Tetrachloroethylene	1000	<2.5	<2.5	<1.0	<0.20	<5.0	<5.0	<5.0	<2.5	<10
Toluene	16	<5.0	<5.0	<1.0	11	17	<10	<10	<5.0	<10
Trichloroethylene	400	<2.5	<2.5	<1.0	<0.20	<5.0	<5.0	<5.0	<2.5	<10
p+m-Xylene	1400	<2.5	<2.5	<1.0	1.6	<5.0	<5.0	<5.0	<2.5	<10
o-Xylene	1400	<2.5	<2.5	<1.0	0.86	<5.0	<5.0	<5.0	<2.5	<10
Total Xylenes	1400	<2.5	<2.5	<1.0	2.5	<5.0	<5.0	<5.0	<2.5	<10
Pesticides & Herbicides	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aldrin	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.05	<0.005
Dieldrin	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.007	<0.005	<0.05	<0.005
a-Chlordane	100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.05	<0.005
g-Chlordane	100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.05	<0.005
o,p-DDT	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.007	<0.005	<0.05	<0.005
p,p-DDT	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.005	<0.05	<0.005
Lindane	none	<0.03	<0.03	<0.03	<0.03	<0.03	<0.003	<0.003	<0.03	<0.003
Hexachlorobenzene	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.05	<0.005
Mirex	100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.005	<0.05	<0.005
Total Endosulfan	None	n/a	n/a	<0.05	<0.05	<0.05	<0.007	<0.005	<0.05	<0.005
Heptachlor + Heptachlor epoxide	None	n/a	n/a	<0.05	<0.05	<0.05	<0.007	<0.005	<0.05	<0.005
Total PCB	1	n/a	n/a	<1	<0.5	<0.5	<0.05	<0.05	<0.5	<0.05

GFL - STONEY CREEK REGIONAL FACILTY MONTHLY ANALYTICAL TEST RESULTS HAMILTON SEWER USE BY-LAW (22-103)	Hamilton Sewer Use By-Law	RESULTS 28-Jun-17	RESULTS 25-Jul-17	RESULTS 29-Aug-17	RESULTS 27-Sep-17	RESULTS 24-Oct-17	RESULTS 29-Nov-17	RESULTS 27-Dec-17	RESULTS 31-Jan-18	RESULTS 26-Feb-18
Calculated Parameters	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Animal/Vegetable Oil and Grease	150	12.0	10.0	23.0	6.7	9.7	1.9	3.0	7.8	4.2
Inorganics	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Biochemical Oxygen Demand BOD (5)	300	64	110	130	100	50	47	47	35	16
Fluoride (F-)	10	2.9	2.9	3.1	3.3	2.6	1.7	2.3	1.7	1.2
Total Kjeldahl Nitrogen (TKN)	100.0	120	120	140	160	100	77	110	83	28
pH	6.0-11.0	8.05	8.07	8.14	8.27	8.04	7.81	7.92	7.73	7.96
Phenols-4AAP	1.0	<1.0	0.12	<0.50 (1)	1.7	<0.020	0.49	0.38	1	<0.10 (1)
Total Suspended Solids (TSS)	350	64	43	51	73	120	25	42	31	17
Sulfate (SO4)	1500	770	750	760	790	690	760	830	630	540
Sulphide (as H2S)	1									
Cyanide (Total CN-)	2	0.34	0.27	0.27	0.64	0.19	0.094	0.19	0.19	0.058
Chloride (Cl-)	1500	1900	2000	2400	2500	2000	1400	1900	1500	600
Petroleum Hydrocarbons	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Oil & Grease	150	12	12	26	8.1	11	1.9	3	9.4	4.2
Total Oil & Grease Mineral/Synthetic	15	0.8	1.4	3.2	1.4	1.4	<0.50	<0.50	1.6	<0.50
Metals	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Aluminum (Al)	50.0	0.2	0.2	0.1	0.1	0.5	0.1	<0.1	0.1	<0.1
Total Antimony (Sb)	5	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Arsenic (As)	1	0.09	0.09	0.1	0.12	0.08	0.03	0.06	0.06	0.02
Total Bismuth (Bi)	5.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	0.7	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Chromium (Cr)	5.0	0.02	0.02	0.02	0.02	0.02	<0.01	0.01	0.01	<0.01
Total Cobalt (Co)	5.0	0.004	0.003	0.004	0.005	0.004	0.002	0.003	0.002	<0.002
Total Copper (Cu)	2.0	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Total Iron (Fe)	50.0	0.52	0.44	0.7	0.59	2.9	0.5	0.44	0.61	0.31
Total Lead (Pb)	2.0	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01
Total Manganese (Mn)	5.0	0.18	0.11	0.12	0.11	0.26	0.13	0.085	0.14	0.076
Mercury (Hg)	0.01	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Molybdenum (Mo)	1.0	0.38	0.37	0.43	0.43	0.32	0.16	0.23	0.16	0.049
Total Nickel (Ni)	2.0	0.14	0.13	0.14	0.16	0.13	0.05	0.091	0.073	0.022
Total Phosphorus (P)	10.0	3.1	3.1	4.1	4.4	3.5	1.6	2.1	1.7	0.57
Total Selenium (Se)	1.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Silver (Ag)	5.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Tin (Sn)	5.0	0.05	0.05	0.04	0.06	0.03	<0.02	0.02	0.03	<0.02
Total Titanium (Ti)	5.0	0.074	0.071	0.062	0.063	0.042	0.016	0.022	0.032	0.01
Total Vanadium (V)	5.0	0.085	0.087	0.095	0.1	0.071	0.024	0.044	0.045	0.015
Total Zinc (Zn)	2.0	0.01	<0.005	<0.005	<0.005	0.15	0.024	0.015	0.027	0.033
Semivolatile Organics	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Di-N-butyl phthalate	80	<8	<8	<8	<8	5	<2	<2	<2	<2
Bis(2-ethylhexyl)phthalate+	280	<8	<8	<8	<8	<2	<2	<2	<2	<2
3,3'-Dichlorobenzidine	2	<3	<3	<3	<3	<0.8	<0.8	<0.8	<0.8	<0.8
Pentachlorophenol	5	<4	<4	<4	<4	<1	<1	<2	<1	<1
Phenanthrene	none	<0.8	<0.8	<0.8	<0.8	0.3	<0.2	<0.2	<0.2	<0.2
Anthracene	none	<0.8	<0.8	<0.8	<0.8	0.5	0.4	<0.2	0.3	<0.2
Fluoranthene	none	<0.8	<0.8	<0.8	<0.8	0.3	<0.2	<0.2	<0.2	<0.2
Pyrene	none	<0.8	<0.8	<0.8	<0.8	0.3	<0.2	<0.2	<0.2	<0.2
Benzo(a)anthracene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2

GFL - STONEY CREEK REGIONAL FACILTY MONTHLY ANALYTICAL TEST RESULTS HAMILTON SEWER USE BY-LAW (22-103)	Hamilton Sewer Use By-Law	RESULTS 28-Jun-17	RESULTS 25-Jul-17	RESULTS 29-Aug-17	RESULTS 27-Sep-17	RESULTS 24-Oct-17	RESULTS 29-Nov-17	RESULTS 27-Dec-17	RESULTS 31-Jan-18	RESULTS 26-Feb-18
Chrysene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b/j)fluoranthene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenzo(a,i)pyrene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(e)pyrene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Perylene	none	<0.8	<0.8	<0.8	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenzo(a,j) acridine	none	<2	<2	<2	<2	<0.4	<0.4	<0.4	<0.4	<0.4
7H-Dibenzo(c,g) Carbazole	none	<2	<2	<2	<2	<0.4	<0.4	<0.4	<0.4	<0.4
Calculated Parameters	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total PAHs (18 PAHs)	5	<3.8	<3.8	<3.8	<3.8	1.4	<0.96	<0.96	<0.96	<0.96
Volatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	10	<1.0	<5	<4.0	<10	<0.20	<5.0	<10	2.8	<2.5
Chloroform	40	<1.0	<5	<4.0	<10	<0.20	<5.0	<10	<2.0	<2.5
1,2-Dichlorobenzene	50	<2.5	<10	<10	<25	<0.50	<10	<25	<5.0	<5.0
1,4-Dichlorobenzene	80	<2.5	<10	<10	<25	<0.50	<10	<25	<5.0	<5.0
cis-1,2-Dichloroethylene	4000	<2.5	<5	<10	<25	<0.50	<5.0	<25	<5.0	<2.5
trans-1,3-Dichloropropene	140	<2.0	<10	<8.0	<25	<0.40	<10	<20	<4.0	<5.0
Ethylbenzene	160	1.6	<5	<4.0	<10	0.36	<5.0	<10	3.9	<2.5
Methylene Chloride(Dichloromethane)	2000	<10	<25	<40	<100	<2.0	<25	<100	<20	<13
1,1,2,2-Tetrachloroethane	1400	<2.5	<10	<10	<25	<0.50	<10	<25	<5.0	<5.0
Tetrachloroethylene	1000	<1.0	<5	<4.0	<10	<0.20	<5.0	<10	<2.0	<2.5
Toluene	16	4.6	<10	14	<10	<0.20	22	<10	37	<5.0
Trichloroethylene	400	<1.0	<5	<4.0	<10	<0.20	<5.0	<10	<2.0	<2.5
p+m-Xylene	1400	3.3	<5	<4.0	<10	0.37	<5.0	<10	7.5	<2.5
o-Xylene	1400	1.9	<5	<4.0	<10	0.26	<5.0	<10	4.2	<2.5
Total Xylenes	1400	5.2	<5	<4.0	<10	0.63	<5.0	<10	12	<2.5
Pesticides & Herbicides	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aldrin	0.2	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
Dieldrin	0.2	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
a-Chlordane	100	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
g-Chlordane	100	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
o,p-DDT	0.1	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
p,p-DDT	0.1	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
Lindane	none	<0.03	<0.03	<0.003	<0.03	<0.03	<0.03	<0.03	<0.003	<0.003
Hexachlorobenzene	0.1	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
Mirex	100	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
Total Endosulfan	None	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
Heptachlor + Heptachlor epoxide	None	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005
Total PCB	1	<0.5	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05

GFL - STONEY CREEK REGIONAL FACILTY MONTHLY ANALYTICAL TEST RESULTS HAMILTON SEWER USE BY-LAW (22-103)	Hamilton Sewer Use By-Law	RESULTS 28-Nov-18	RESULTS 22-Oct-19	RESULTS 11-Dec-20	RESULTS 16-Dec-21	RESULTS 23-Nov-22
Calculated Parameters	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Animal/Vegetable Oil and Grease	150	<0.50	6.4	1.5	2.8	<0.50
Inorganics	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Biochemical Oxygen Demand BOD (5)	300	3	96	7	36	9
Fluoride (F-)	10	1.2	1.4	1.2	2.2	1.4
Total Kjeldahl Nitrogen (TKN)	100.0	16	85	21	66	48
pH	6.0-11.0	7.91	7.53	7.8	7.78	8.1
Phenols-4AAP	1.0	0.0034	0.22	0.0031	0.086	0.0057
Total Suspended Solids (TSS)	350	11	55	20	45	37
Sulfate (SO4)	1500	830	900	980	710	1000
Sulphide (as H2S)	1					0.046
Cyanide (Total CN-)	2	0.0065	0.10	0.016	0.091	0.0061
Chloride (Cl-)	1500	520	1500	710	1200	1300
Petroleum Hydrocarbons	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Oil & Grease	150	<0.50	7.7	2.7	3.8	<0.50
Total Oil & Grease Mineral/Synthetic	15	<0.50	1.3	1.2	1	<0.50
Metals	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Aluminum (Al)	50.0	<0.1	<0.1	0.2	0.2	0.5
Total Antimony (Sb)	5	<0.02	<0.02	<0.02	<0.02	<0.02
Total Arsenic (As)	1	<0.01	0.03	<0.01	0.03	0.01
Total Bismuth (Bi)	5.0	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	0.7	<0.002	<0.002	<0.002	<0.002	<0.002
Total Chromium (Cr)	5.0	<0.01	<0.01	<0.01	<0.01	<0.01
Total Cobalt (Co)	5.0	<0.002	0.002	<0.002	0.015	<0.002
Total Copper (Cu)	2.0	<0.01	<0.01	<0.01	<0.01	<0.01
Total Iron (Fe)	50.0	0.34	0.59	0.69	0.45	0.89
Total Lead (Pb)	2.0	<0.01	<0.01	<0.01	<0.01	<0.01
Total Manganese (Mn)	5.0	0.19	0.11	0.36	0.2	0.074
Mercury (Hg)	0.01	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Total Molybdenum (Mo)	1.0	0.019	0.12	0.036	0.14	0.079
Total Nickel (Ni)	2.0	0.008	0.058	0.017	0.071	0.034
Total Phosphorus (P)	10.0	0.24	1.1	0.28	1.2	0.38
Total Selenium (Se)	1.0	<0.02	<0.02	<0.02	<0.02	<0.02
Total Silver (Ag)	5.0	<0.01	<0.01	<0.01	<0.01	<0.01
Total Tin (Sn)	5.0	<0.02	<0.02	<0.02	0.02	<0.02
Total Titanium (Ti)	5.0	<0.005	0.008	0.006	0.014	0.013
Total Vanadium (V)	5.0	0.007	0.018	0.005	0.028	0.013
Total Zinc (Zn)	2.0	0.032	0.022	0.095	0.023	0.021
Semivolatile Organics	ug/L	mg/L	mg/L	ug/L	ug/L	ug/L
Di-N-butyl phthalate	80	<2	<8	<2	<8	<8
Bis(2-ethylhexyl)phthalate+	280	<2	<8	<2	<8	<8
3,3'-Dichlorobenzidine	2	<0.8	<3	<0.8	<3	<3
Pentachlorophenol	5	<1	<4	<1	<4	<4
Phenanthrene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Anthracene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Fluoranthene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Pyrene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Benzo(a)anthracene	none	<0.2	<0.8	<0.2	<0.8	<0.8

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Chrysene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Benzo(b/j)fluoranthene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Benzo(k)fluoranthene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Benzo(a)pyrene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Indeno(1,2,3-cd)pyrene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Dibenz(a,h)anthracene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Benzo(g,h,i)perylene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Dibenzo(a,i)pyrene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Benzo(e)pyrene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Perylene	none	<0.2	<0.8	<0.2	<0.8	<0.8
Dibenzo(a,j) acridine	none	<0.4	<2	<0.4	<2	<2
7H-Dibenzo(c,g) Carbazole	none	<0.4	<2	<0.4	<2	<2
Calculated Parameters	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total PAHs (18 PAHs)	5	<0.96	<3.8	<0.96	<3.8	<3.8
Volatile Organics	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	10	<0.20	<10	<10	<10	<10
Chloroform	40	<0.20	<10	<10	<10	<10
1,2-Dichlorobenzene	50	<0.50	<25	<20	<20	<20
1,4-Dichlorobenzene	80	<0.50	<25	<20	<20	<20
cis-1,2-Dichloroethylene	4000	<0.50	<25	<25	<25	<25
trans-1,3-Dichloropropene	140	<0.40	<20	<20	<20	<20
Ethylbenzene	160	<0.20	<10	<10	<10	<10
Methylene Chloride(Dichloromethane)	2000	<2.0	<100	<100	<100	<100
1,1,2,2-Tetrachloroethane	1400	<0.50	<25	<20	<20	<20
Tetrachloroethylene	1000	<0.20	<10	<10	<10	<10
Toluene	16	<0.20	25	<10	12	<10
Trichloroethylene	400	<0.20	<10	<10	<10	<10
p+m-Xylene	1400	<0.20	<10	<10	<10	<10
o-Xylene	1400	<0.20	<10	<10	<10	<10
Total Xylenes	1400	<0.20	<10	<10	<10	<10
Pesticides & Herbicides	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aldrin	0.2	<0.005	<0.005	<0.005	<0.005	<0.005
Dieldrin	0.2	<0.005	<0.005	<0.005	<0.005	<0.005
a-Chlordane	100	<0.005	<0.005	<0.005	<0.005	<0.005
g-Chlordane	100	<0.005	<0.005	<0.005	<0.005	<0.005
o,p-DDT	0.1	<0.005	<0.005	<0.005	<0.005	<0.005
p,p-DDT	0.1	<0.005	<0.005	<0.005	<0.005	<0.005
Lindane	none	<0.003	<0.003	<0.003	<0.003	
Hexachlorobenzene	0.1	<0.005	<0.005	<0.005	<0.005	<0.005
Mirex	100	<0.005	<0.005	<0.005	<0.005	<0.005
Total Endosulfan	None	<0.005	<0.005	<0.005	<0.005	
Heptachlor + Heptachlor epoxide	None	<0.005	<0.005	<0.005	<0.005	
Total PCB	1	<0.05	<0.05	<0.05	<0.05	<0.05

Attachment 2

LTS Systems Adjustments

GFL Stoney Creek Regional Facility
Modifications to Leachate Treatment System

Date	Pumping Location	FeCl Added	H2O2 Added	Changes	Notes
21-Jul-23	-	no	no	Brought in ferric chloride	-
24-Jul-23	-	no	no	-	Bench testing conducted on FeCl
25-Jul-23	-	no	no	-	Ferric chloride was placed by tile and dosing pump was installed
26-Jul-23	LCB	yes	no	-	Began pumping from the Leachate Collection Blanket (LCB) and drip dosing ferric chloride into the tile.
1-Aug-23	LCB	yes	no	-	It was investigated that the infrastructure was not in place for effective treatment. Recommendation for weir box, bio box, and aeration modification were made.
2-Aug-23	LCB	yes	no	The LCB was shocked with ferric chloride (1 tote)	-
3-Aug-23	LCB	yes	no	-	Weir box was constructed
8-Aug-23	LCB	yes	no	-	Bio box was constructed, but needs wood
9-Aug-23	LCB	yes	no	Crew came in to install modifications. The LCB shocking with ferrous sulphate began on a as needed basis	Installation of weir box, pvc port for dosing into the inlet prior to discharge into the tile, aerator placement
10-Aug-23	LCB	yes	no	-	Wood being added to the bio box
14-Aug-23	LCB	yes	no	Bio box was placed and connected	-
16-Aug-23	LCB	yes	no	Leachate and treatment system initialized. Decreased FeCl dosage from initial	Initial modifications were finished. Decreased FeCl dosage to see how odours would change at the tile. Trial only ran for 40 min
17-Aug-23	LCB	yes	no	Pumping rate was increased	Pumping was done at the end of the day and was shut down.
18-Aug-23	LCB	yes	no	Pumping rate was decreased	Short circuiting was observed and a correction to pumping rate was made. Pump was reinitialized at a lower pump rate to maintain retention time at Interim Leachate Pump Station (ILPS)
23-Aug-23	LCB	yes	no	Increased FeCl dosage	Mild odour was detected around the lagoon increased FeCl dosage around 9:15 am, inspected the pond after dose increase at 9:45 am and no odours were detected. Ministry arrive later and detected odour, additional increase in dosage was applied.
28-Aug-23	LCB	yes	no	Decreased FeCl dosage, decreased pumping rate	It was noticed that when the access hatch at the tile was left open, the lagoon was less odorous. Further modifications were needed to draw the offgasing from the tile to the bio box. Pungent odours detected at Echo Valley. Odour complaints arose. Reduced dosage and pumping rate.
5-Sep-23	LCB	yes	no	Decreased pumping rate	Decreased pumping rate to adjust and prevent treatment short circuiting in the tile. After adjustment was made it was observed that the tile was off gassing the majority of the odours.
7-Sep-23	LCB	yes	no	Placed rubber gasket on tile access hatch, decreased pumping rate, increased FeCl dosage	Further decreased pumping rate to adjust and prevent treatment short circuiting in the tile. Detected rotten egg smell by the pond and sewer house, increased dosage to mitigate odour.
8-Sep-23	LCB	yes	no	Added another off gas line from the tile to the bio box	Bio box showed biological growth. An additional line was provided to create a vacuum pressure in the tile to minimize odour leakage from the tile.
12-Sep-23	LCB	yes	no	increased pumping rate, decreased FeCl dosage	Through investigation the leachate pumping rate was adjusted to provide optimum flow (maximizing flow rate without short circuiting). Ferric chloride dosage was decreased to reduce odours
13-Sep-23	LCB	yes	no	Decreased FeCl dosage, decreased pumping rate	Low levels of H2S was detected at the sewer house. Reduced FeCl to further reduce odours. The tile foamed over and dosage and flow was reduced to reassess and restart, over foaming was most likely linked to over aerating at the time. It was tested to see how much aeration the system can handle before over foaming occurred.
15-Sep-23	LCB	yes	no	The LCB shocking with ferrous sulphate stopped	-
25-Sep-23	LCB	yes	no	Increased flow rate	Bench testing conducted on the leachate from the permanent leachate pumping station. Increased flow rate back to optimal flow.
2-Oct-23	LCB	yes	no	Increased pumping rate, Increased FeCl dosage	Conducted bench test with combinations of ferric chloride with hydrogen peroxide. H2S readings were found at the tile, increased FeCl dosage to address
4-Oct-23	LCB	yes	no	Injection port installed on the discharge side of tile for addition of hydrogen peroxide	Conducted bench test with just hydrogen peroxide and just ferric chloride.
6-Oct-23	LCB	yes	no	Increase FeCl Dosage	H2S readings observed at various points, increased FeCl dosage to address

GFL Stoney Creek Regional Facility
Modifications to Leachate Treatment System

Date	Pumping Location	FeCl Added	H2O2 Added	Changes	Notes
10-Oct-23	PLPS	yes	no	Switched location of leachate pumping from the LCB to the Permanent Leachate Pumping Station (PLPS), decreased FeCl dosage	Switched pumping location as the blanket was generating odours, lowered and maintained FeCl dosage as at this rate it does not produce excessive odours. The blanket began increasing in H2S. The PLPS has a high H2S concentration at the source. Prior to this the H2S was fairly low at the source at the blanket. Secondary fan was turned off so odours increased at the tile and decreased at the bio box, decrease FeCl because the smell was too odorous
11-Oct-23	PLPS	yes	yes, post FeCl	Injection of hydrogen peroxide began	Adding additional treatment to address H2S. Bench test results showed FeCl and H2O2 both reduce H2S concentrations from OR to 0 ppm
13-Oct-23	PLPS	yes	yes, post FeCl	-	A carbon filter air scrubber was brought to site for installation. Prepared the PLPS for pretreatment dosage. Electrical and other infrastructure built to support dosing station.

Attachment 3

GFL Odour Complaint Procedures

GFL – Odour Complaint Investigations and Reporting Procedure

- All complaints received will be assigned a control number and recorded electronically.
- Details of the complaint are forwarded to GFL Management for follow-up.
- GFL Management will ensure that the complaint is investigated and resolved in a timely manner.
- Determine where the odour complaint originates from, typically provided by the complainant.
- Using online meteorological data to establish wind direction, a determination will be made if the odour is being carried from the landfill to the source of the complaint.
- If the investigation is determined that the odour is not caused by the landfill through sufficient evidence, then the information and observations will be recorded, and a formal letter will be sent to the complainant.
- If an occurrence is deemed to be sourced from the landfill, immediate mitigation measures will be taken to deal with the odour issues. The information and observations will be recorded, and a formal letter will be sent to the complainant.
- In addition, copies of complaints and responses will be sent to the Community Liaison Committee, the City and the MECP.
- Complaints will be summarized for inclusion in the Annual Report.

CITY OF HAMILTON

M O T I O N

Public Health Committee: April 29, 2024

MOVED BY MAYOR A. HORWATH……

SECONDED BY COUNCILLOR ……..……

Resolution to declare the City of Hamilton a "No Paid Plasma Zone"

WHEREAS, the City of Hamilton supports voluntary blood and plasma donation and aims to protect our public collection system, recognizing the importance of blood donation as a public good;

WHEREAS, Canada's tainted blood crisis resulted in the loss of approximately 8,000 lives and the subsequent Royal Krever Commission recommended Canada operate a fully voluntary, non-remunerated blood and plasma donation system;

WHEREAS, within Ontario's healthcare system blood donations are viewed as a public resource;

WHEREAS, the integrity of the of the public, voluntary donor system must be protected;

WHEREAS, in Ontario, the Voluntary Blood Donations Act, stipulates that it is against the law for private companies to pay donors and for donors to receive payment for their blood or plasma;

WHEREAS, paid plasma collection schemes are known to target and exploit the most vulnerable members of among communities; and

WHEREAS, this resolution reaffirms the principles of voluntary, non-remunerated blood and plasma donation and aims to protect the integrity of Canada's public blood system and the integrity of blood donors.

THEREFORE, BE IT RESOLVED:

(a) That the City of Hamilton designates itself a "Paid-Plasma Free Zone" and declares that private for-profit blood collection companies are not permitted to operate in the city;

(b) That the City of Hamilton resolves to protect marginalized and vulnerable populations from exploitation resulting from for-profit plasma collection by advertising financial payment for the sale of their blood-plasma; and

(c) That a copy of this resolution be sent to Canadian Blood Services, federal, provincial and territorial Ministers of Health, Grifols pharmaceuticals, and all Ontario Municipalities requesting that they respect the City of Hamilton as a “Paid-Plasma Free Zone” and support only voluntary Blood and plasma collection.