ELLSIN ENVIRONMENTAL LTD.

ERO Proposal 019-3370

ABSTRACT

A request to the Ministry of Environment, Conservation and Parks (MECP) to delay the approval of a proposal (ERO 019-3370) to permit Ellsin Environmental Ltd. to increase processing of waste tires to a commercial scale from their pilot plant. The current ambient air quality monitoring network around the industrial sector is not sufficient to provide adequate background data required for the proposal.

Selva Rasaiah

Submitted to: Environmental Registry of Ontario (ERO)

Submitted by: Selva Rasaiah

Date Submitted: May 03, 2021

Revised: May 04, 2021

The ERO proposal 019-3370 to permit Ellsin Environmental Ltd. to begin a commercial scale operation from its current operations, should not be granted by the MECP at this time. The proposal requires a more thorough evaluation of the ASI AAQM network and the MECP PM 2.5 monitor at Sault College in providing acceptable background data. There have been consistent concerns from the public for over a decade regarding the efficiency of the current air quality network at characterizing particulate levels closer to the industrial sector. Since the removal of the PM 2.5 monitor from the Patrick St. site in 2003, there has been no reliable measured data of the ambient air concentrations of PM 2.5 that could reasonably approximate the background levels in areas closer to the industrial sector.

A fundamental consideration for approval should require that background data be robust and collected from an ambient air quality network that the local MECP can be confident is reliable and accurate in keeping residents safe and protecting the natural environment. On January 21, 2019, a request was made by the local MECP office for the MECP Technical Support to assess the accuracy and reliability of the current AAQM network in Sault Ste Marie. On September 03, 2019, the local ministry provided a response from MECP Technical Support based on that request stating, "Due to limited resources and priority ranking, a definitive date for completion has not been set". In ACLC meetings, it was stated they are in talks to consider adding monitoring devices on the east side of ASI, but it would require the development of a technical standard.

Since emissions are modelled, the current AAQM must be able to more conclusively demonstrate that predicted levels reflect the actual air quality around the industrial sector. Air quality data from ASI's AAQM network accessible to residents living around the industrial sector is limited and does not include an air quality index. An air quality index to advise residents on the overall air quality cannot be provided without a monitor that measures PM 2.5 levels and the additional parameters once provided by the former Patrick St. location (Wm. Merrifield) near the industrial sector.

There is only one monitor in the ASI AAQM network that continuously measures PM 10. Since there is no correlation between the PM 10 levels and PM 2.5 levels, the readings and recommended air quality index provided by the MECP monitor at Sault College, do not provide useful information to residents living near the industrial sector. Due to the higher elevation and distance from the industrial sector, the MECP monitor can not be exclusively used in modelling data and should be compared to another monitor which is at a similar elevation and closer proximity to the area being evaluated such as its former location at Patrick St. (71068). The geographical circumstances of the industrial sector being at a lower elevation favours the accumulation of particulate matter closer to locations where it is being released. Despite a small population under 16,000 people and no heavy industry, the monitors in Sault Michigan have higher average PM 2.5 readings when compared to the MECP monitor at Sault College. In its last year of operation at Patrick St. site, the MECP PM 2.5 monitor recorded the highest number of exceedances compared to the any other year at the new location at Sault College.

In 2019, the MECP convicted Ellsin on multiple offences from 2015 and 2017 including altering the approved extraction methods. By altering the process without MECP consent, the modelled emissions for the pilot plant would be less accurate and the deficiencies in the monitoring network would not have accounted for any discrepancies. Current ambient air quality testing does not regularly account for chemicals specifically related to processes like tire recycling. A 2020 Q2 GHD report for ASI's AAQM network noted the presence and an exceedance of chloroform that could be attributed to Ellsin Environmental operations. The current extraction process may not be sufficient at increased production rates to ensure that the limits are within the predicted modelled emissions. Further real-time air quality data would be required to confirm that the current process is more accurately reflecting the modelled emissions since there were changes in the accepted methodology approved by the MECP. Since the company plans to construct additional commercial facilities in Ontario, it would be important to ensure that emissions are accurately characterized since this proposal will be referenced in the future.

The MECP does not have sufficient data to conclude that background levels in the proposal represent the area around the facility. Since more time is required to develop a technical standard for the steel industry which impacts the assessment and arrangement of the AAQM network, the proposal should be referred to a later date when a technical standard has been developed and the ASI AAQM network has been reassessed by the MECP Technical Support Branch as accurate and reliable.

Why is no one warning us about today's smog?

Okay - it's 10:45 a.m. and Algoma Steel Inc.'s air quality monitoring website says the last time it was updated was at 11 a.m. today. If that doesn't give you cause for concern, read on.

Jun 5, 2008 2:40 PM By: [redacted]

Okay - it's 10:45 a.m. and Algoma Steel Inc.'s air quality monitoring website says the last time it was updated was at 11 a.m. today.

If that doesn't give you cause for concern, read on.

The ASI wesbite also says there were 73 parts per million (ppm) of fine particulate matter (PM10) in the air around its Wallace Terrace monitoring equipment as of 11 a.m.

Anyone with eyes can see it's bad.

Shown is the view at noon from a hazecam located at Lake Superior State University in Sault, Michigan.

Local environmentalist [redacted], who co-authored an air-quality study on the West End last October, says that PM10 levels of just 50 ppm would likely trigger a smog alert.

Air quality conditions in that range can have short-term adverse effects on the human or animal populations, or may cause significant damage to vegetation and property.

The Algoma Public Health website warns that such conditions can put people with respiratory ailments at risk.

But is anyone bothering to advise Saultites so those at risk can take precautionary measures?

Noooooooo.

Based on its monitoring station, conveniently located at Sault College, the Environment Ministry assures us that Sault Ste. Marie's air quality is "good" today.

Yeah, right!

Essar Algoma Steel Inc. is aware of today's high readings and is trying to find the source, says its manager [redacted]

"The PM10 figure on the site is a 24-hour rolling average which is the monitoring standard defined by the ministry," [redacted] at 10:27 a.m. "Our environmental team is in the process of pulling yesterday's detailed data (on an hourly basis), including wind patterns which will give us a better understanding of the reading and potential source."

[redacted] get back to us when she has more information.

[redacted] says that today's mist is probably making things worse.

"With moisture like this, the mist will hold onto the fine particles and carry them back to the ground," he says.

[redacted] isn't surprised by the discrepency in readings between the official government monitoring station at Sault College and the Algoma Steel location.

"A monitoring system up here (on the hill) is not much use to local areas like the West End," he says. "There is a clear need for more localized monitoring."

The Sault College station often registers little or no fine particulate matter while the two Algoma Steel monitors in the West End may measure significantly higher, he says.

Especially on a misty day like today.

The moisture traps fine particles and keeps them down below the hill, he says.

Source: https://www.sootoday.com/local-news/why-is-no-one-warning-us-about-todays-smog-117131

Note: The names of individuals were vetted for the purpose public commenting on ERO proposals

Photo 1: Current Algoma Steel Inc. Ambient Air Quality Network (AAQM)

Photo 2: St. Marys Bowmanville Cement Plant PM Monitoring network (modified Google Image, 2020)

Note: The cement plant has a more comprehensive ambient air quality network surrounding it than the industrial sector in Sault Ste. Marie which includes an integrated steel plant (ASI). It has two continuous PM 10 monitors, and three meteorological stations compared to only one in ASI's AAQM network

ALGOMA STEEL INC.
AMBIENT AIR QUALITY MONITORING NETWORK (AAQM)

WALLACE TERRACE (71090)

Measured Parameters	Sampling Frequency
CONTINUOUS	
Total Reduced Sulphur (TRS) - 24 hr	1 min
Total Reduced Sulphur (TRS) - 10 min	1 min
Particulate Matter (PM10)	1 hr
NON-CONTINUOUS	
Particulate Matter (PM 10)	6th day
Total Suspended Particulate (TSP)	6th day
Total Suspended Particulate (TSP) Metals	6th day
Volatile Organic Compound (VOCs) Benzene	12th day
Polyaromatic Hydrocarbon (PAHs) BaP	12th day

PATRICK ST. (71068)

Measured Parameters	Sampling Frequency
CONTINUOUS	
Total Reduced Sulphur (TRS) - 24 hr	1 min
Total Reduced Sulphur (TRS) - 10 min	1 min
NON-CONTINUOUS	
Particulate Matter (PM 10)	6th day
Total Suspended Particulate (TSP)	6th day
Total Suspended Particulate (TSP) Metals	6th day
Volatile Organic Compound (VOCs) Benzene	12th day
Polyaromatic Hydrocarbon (PAHs) BaP	12th day

DUSTFALL STATIONS (DUSTFALL JARS)

BONNEY ST.
(71042)

SPADINA AVE.
(71015)

WILDING AVE.
(71043)

ADELAIDE ST.
(71045)

Continuous for 30 days

METEOROLOGICAL STATION (GOULAIS AVE.)

Notes: Every 6th day (60 samples/year)
Every 12th day (30 samples/year)
No PM 2.5 Monitor

Photo 3: The parameters and schedule (sampling frequency) of the stations in ASI's AAQM network.

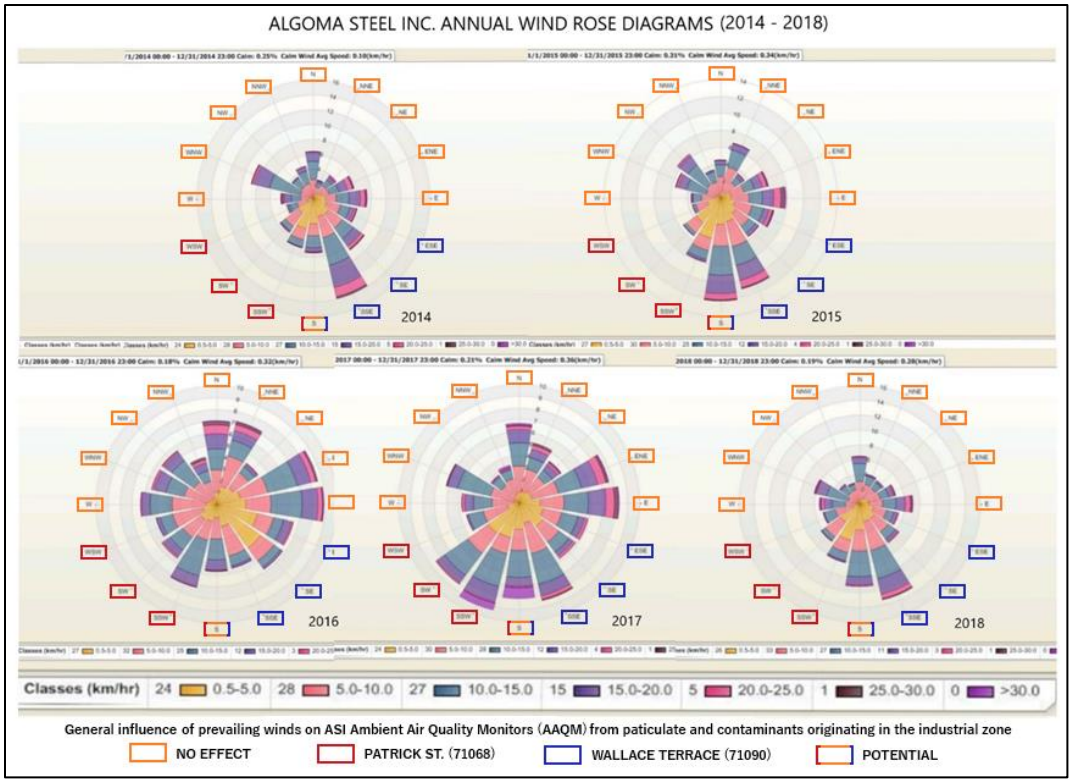

Photo 4: Windrose diagrams showing the influence of prevailing winds on ASI's AAQM stations

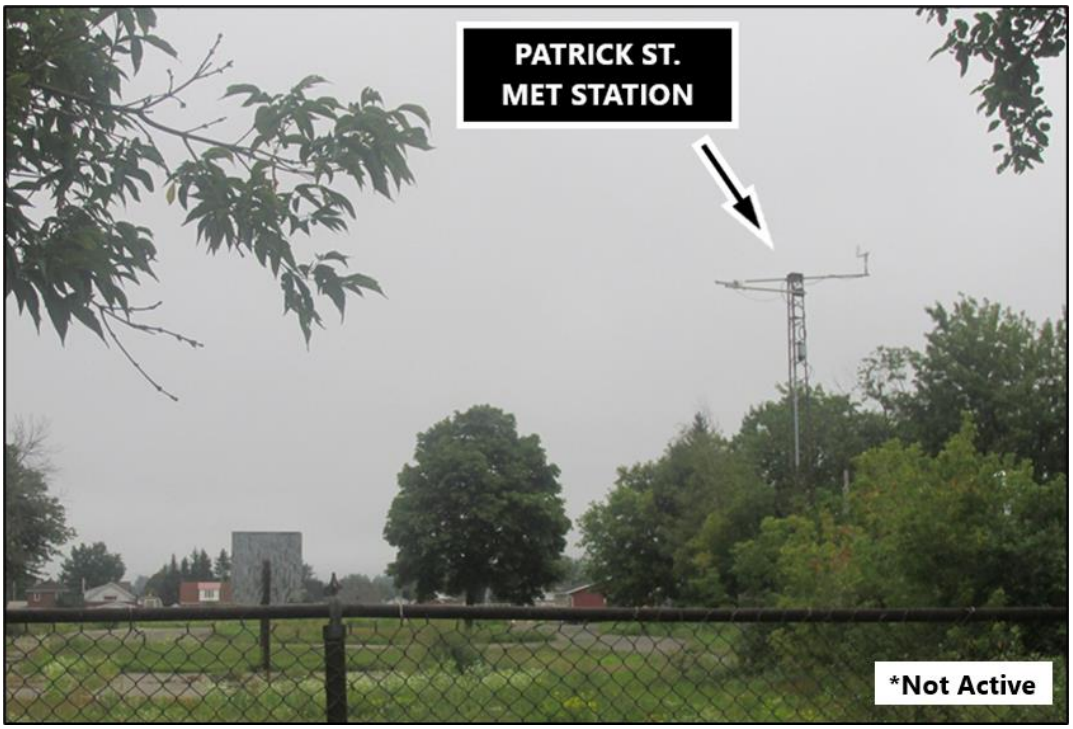

Photo 5: The meteorological station at Patrick St. (71068) deactivated in the mid 2000's

WALLACE TERRACE (71090)
PM 10_BAM (1 hr) [ug/m3]

3/25/2019	20:00	8
3/25/2019	21:00	8
3/25/2019	22:00	9
3/25/2019	23:00	6
3/26/2019	00:00	77
3/26/2019	01:00	8
3/26/2019	02:00	9
3/26/2019	03:00	15
3/26/2019	04:00	43
3/26/2019	05:00	106
3/26/2019	06:00	73
3/26/2019	07:00	131
3/26/2019	08:00	127
3/26/2019	09:00	130
3/26/2019	10:00	178
3/26/2019	11:00	31
3/26/2019	12:00	23
3/26/2019	13:00	31
3/26/2019	14:00	33
3/26/2019	15:00	5
3/26/2019	16:00	6
3/26/2019	17:00	4
3/26/2019	18:00	0
3/26/2019	19:00	0
3/26/2019	20:00	11
3/26/2019	21:00	38
3/26/2019	22:00	92
3/26/2019	23:00	33
3/27/2019	00:00	34
3/27/2019	01:00	24
3/27/2019	02:00	20
3/27/2019	03:00	18
3/27/2019	04:00	34
3/27/2019	05:00	70
3/27/2019	06:00	132
3/27/2019	07:00	184
3/27/2019	08:00	50
3/27/2019	09:00	50
3/27/2019	10:00	85
3/27/2019	11:00	59
3/27/2019	12:00	59
3/27/2019	13:00	129
3/27/2019	14:00	153
3/27/2019	15:00	127
3/27/2019	16:00	43
3/27/2019	17:00	39
3/27/2019	18:00	91
3/27/2019	19:00	65
3/27/2019	20:00	18
3/27/2019	21:00	21
3/27/2019	22:00	37
3/27/2019	23:00	25
3/28/2019	00:00	31
3/28/2019	01:00	14

MARCH 26, 2019

MIN: 0
MAX: 178
AVG: 49

MARCH 27, 2019

MIN: 18
MAX: 184
AVG: 65

*** Average daily limit is 50 ug/m3**

001481

Photo 6: PM 10 readings from the Wallace Terrace station (71090) on March 26-27, 2019 highlighting exceedances (greater than 50 ug/m^3).

Note: March 27, 2019 exceeded the average daily limit. Data acquired from MECP FOI A-2019-03628

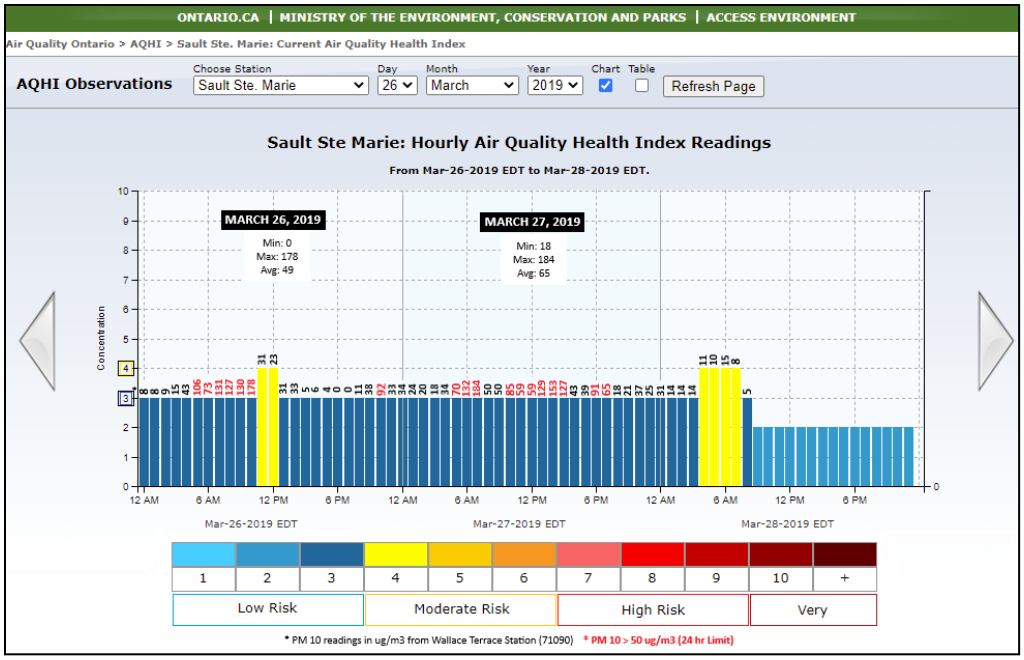

Photo 7: PM 10 data overlaid on Air Quality Health Index (AQHI) data MECP monitor (71078)

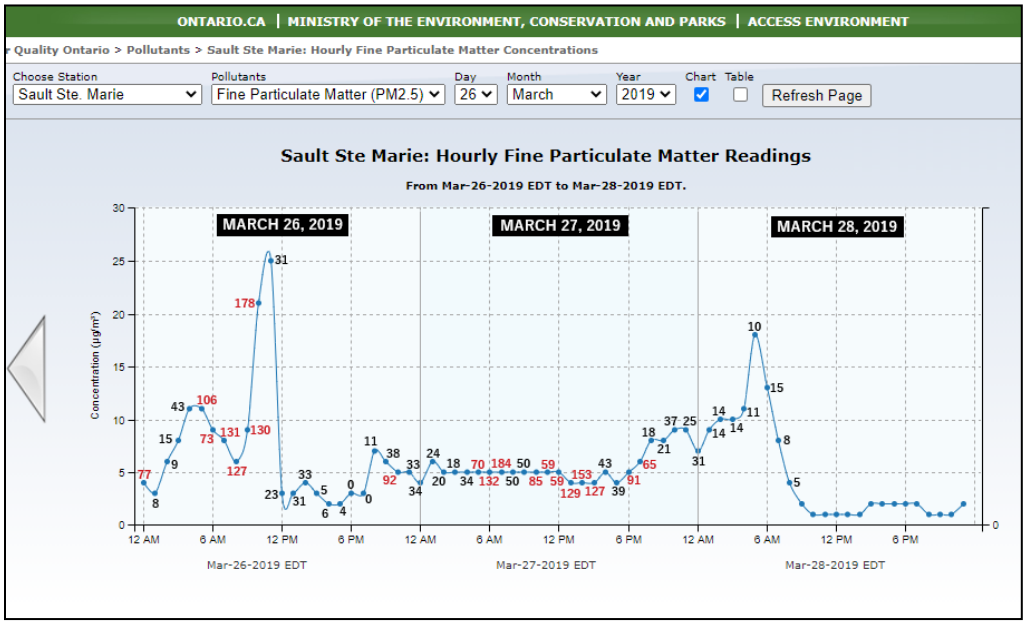

Photo 8: PM 10 data overlaid on PM 2.5 readings from MECP Sault College monitor (Modified)

Source: http://www.airqualityontario.com/history/pollutant.php?stationid=71078

Note: The PM 2.5 and AQHI data from the MECP monitor (71078) at Sault College does not directly correlate to the PM 10 readings and exposure near ASI. There is no general air quality rating on ASI's site to advise residents to any potential health concerns since AQHI is based on PM 2.5, NO_2 and ozone which are not measured at the Wallace Terrace station (71090) or at any location of ASI AAQM network.

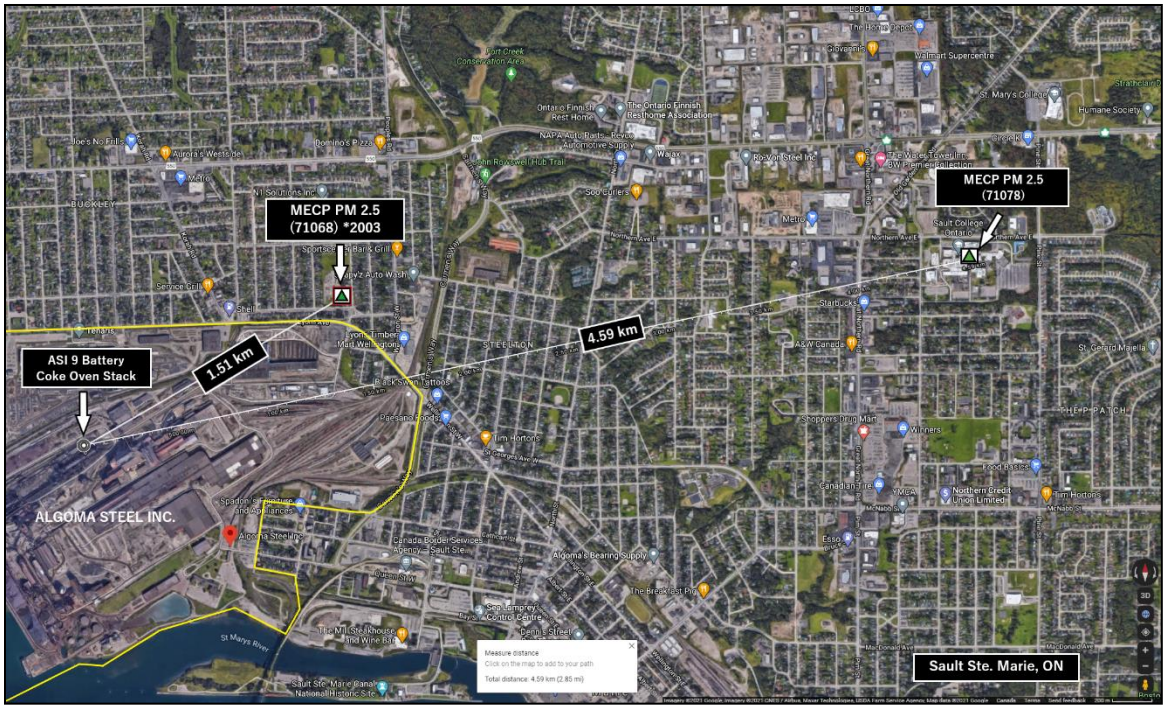

Photo 9: Distance of old MECP PM 2.5 monitor (71068) compared to current location from 9 battery

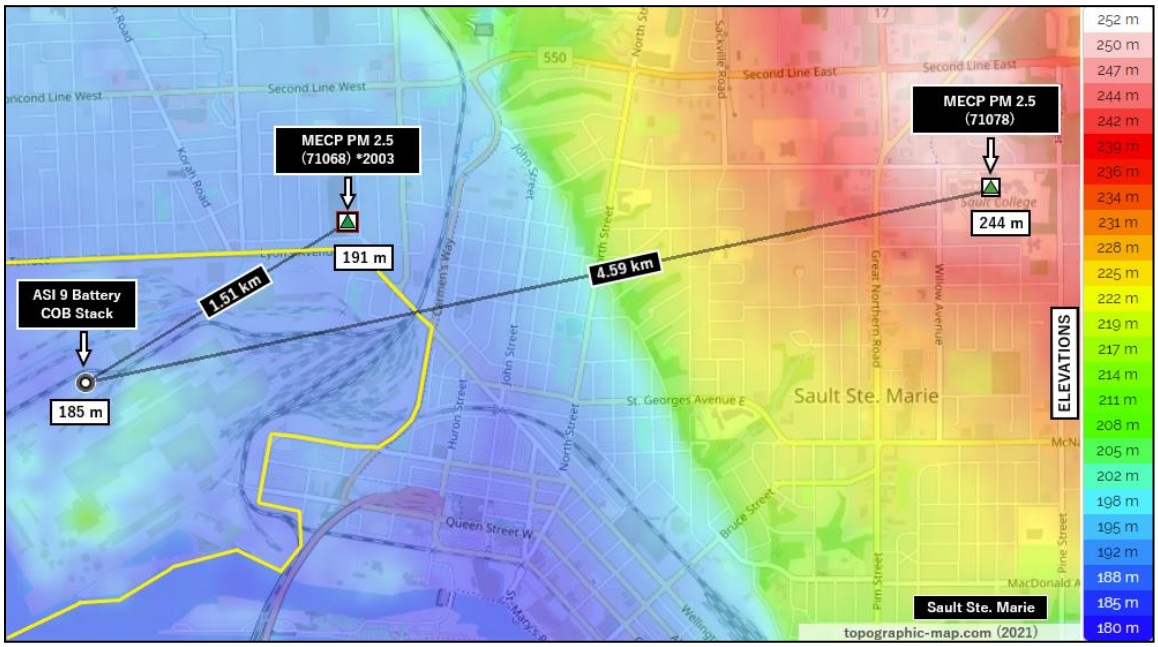

Photo 10: Elevation of old MECP PM 2.5 monitor (71068) compared to current location from 9 battery

Note: The current MECP PM 2.5 (71078) ambient air quality monitor is located on a "hilltop" at a higher elevation (53 m higher) and is 3.08 km further than the original location at Patrick St. (71068) from the ground level of ASI's 9 Battery COB stack. Unfavourable meteorological conditions and poor dispersion of fugitive emissions could result in particulate persisting in a "valley" around ASI and not be detected by the MECP meter. The Industrial zone is approximated and is outlined in yellow. (Modified images)

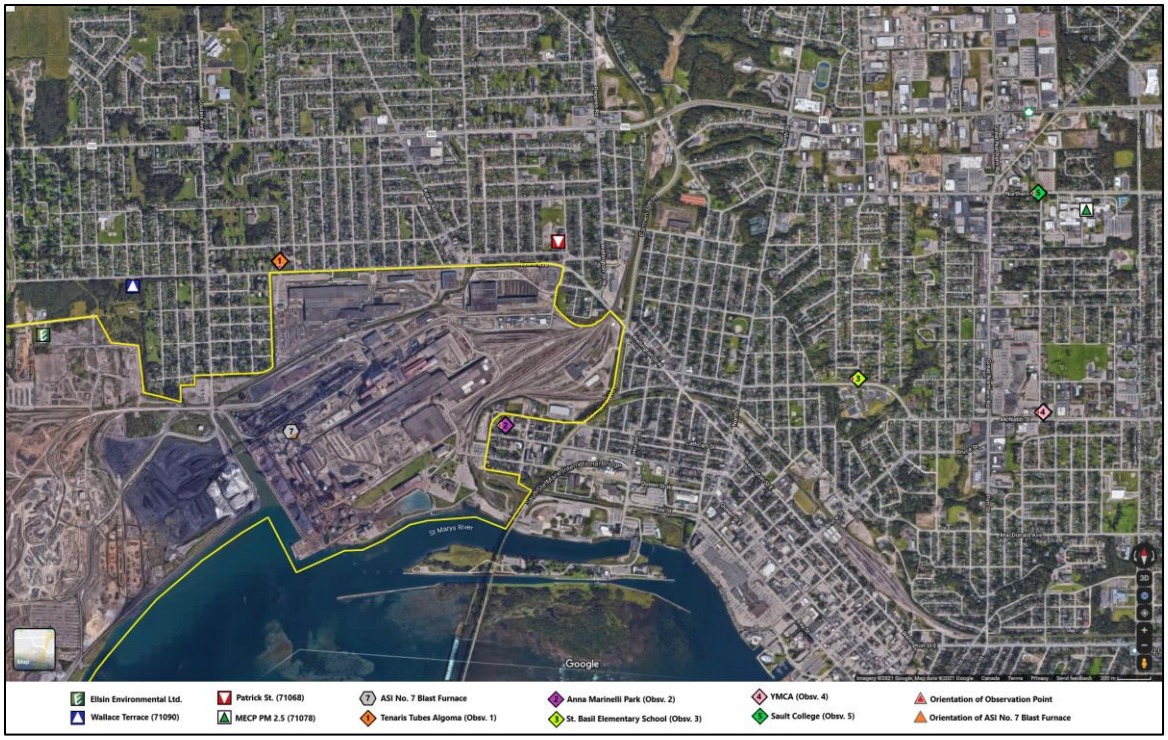

Photo 11: Observation sites to show perspective of elevations relative to ASI's No. 7 Blast Furnace

Photo 12: Wallace Terrace @ Wilding Ave (Tenaris Algoma Tubes) Observation Point 1 ◆

Photo 13: Cathcart St. @ West St. (Anna Marinelli Park) Observation Point 2

Photo 14: St. Georges Ave. E @ Grand Blvd. (St. Basil Elementary School) Observation Point 3

Photo 15: McNabb St. @ Willow Ave. (YMCA) Observation Point 4

Photo 16: Northern Ave. @ Willow Ave. (Sault College) Observation Point 5

Photo 17: Distance of MECP and HAMN PM 2.5 monitors to AMD and Stelco's closest COB stack

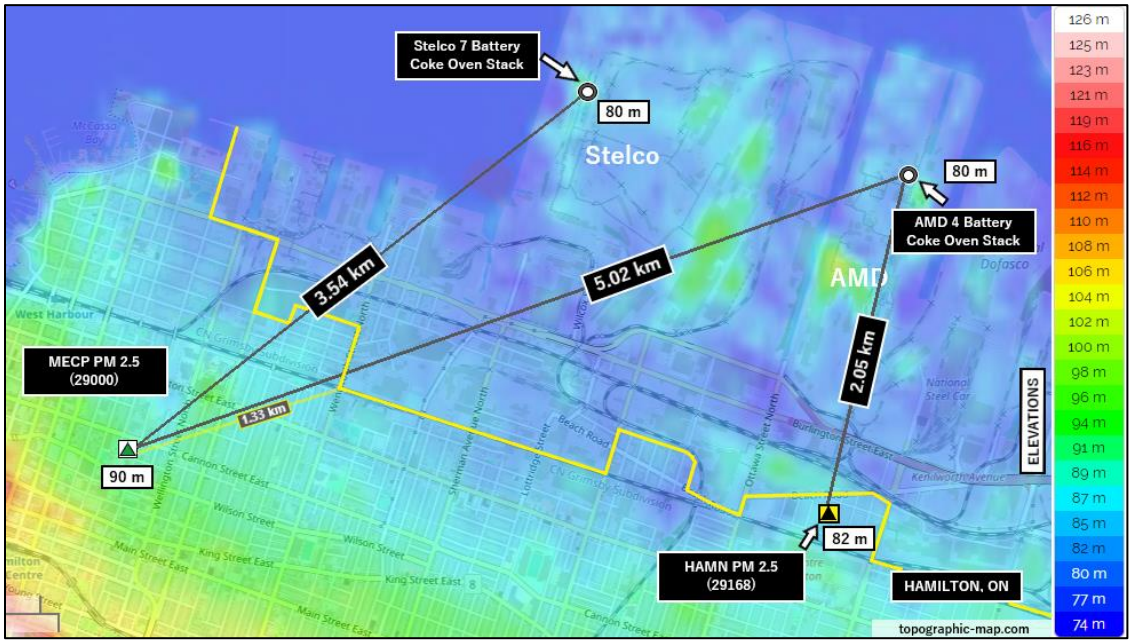

Photo 18: Elevation of MECP and HAMN PM 2.5 monitors to AMD and Stelco's closet COB stack

Note: The MECP and HAMN PM 2.5 ambient air quality monitors are located at a similar elevation (1-10 m difference) from the ground level of ArcelorMittal Dofasco (AMD) and Stelco coke oven battery (COB) stacks. The similar elevations favour more accurate readings of PM 2.5 levels exposed to residents during unfavourable meteorological conditions and poor dispersion by fugitive emissions. The MECP PM 2.5 (29000) monitor is 1.33 km from the industrial zone which is approximated in yellow

Air Quality Data

Algoma Steel Inc. monitors air quality through two ambient air quality monitoring stations maintained by the company. The stations are located on Wallace Terrace, just west of Goulais Avenue, and on Patrick Street at the former William Merrifield Public School.

Click on this link to view a map of the locations.

The stations continuously monitor two key air quality parameters:

TRS is "Total Reduced Sulphur"
The Ministry of Environment, Conservation and Parks ambient air quality criterion for TRS is 7 micrograms per cubic metre (5 parts per billion) for a 24 hour period and 13 micrograms per cubic metre for a 10 minute period (10 parts per billion).

PM10 is "fine particulate matter"
The adopted Ministry of Environment, Conservation, and Parks interim ambient air quality criterion for PM10 is 50 micrograms per cubic metre for a 24-hour period, which is based on a Canada Wide Standard.

The following table shows the current data:

Algoma Steel Inc. Air Quality Information			
Parameter	**Sensor Location**	**Units**	**Value**
TRS	Wallace Terrace Station	Hourly parts per billion	0
PM10 (1)	Wallace Terrace Station	24 hour micrograms per cubic metre	5
TRS	Patrick Street Station	Hourly parts per billion	0
~Wind Direction Vector(2)	Wallace Terrace Station	Hourly degrees	7
Wind Speed Vector(2)	Wallace Terrace Station	Hourly km/hr	8
Air Temperature	Wallace Terrace Station	Hourly Celsius degrees	-73
Page last updated at **08:00 AM** on **April 01 2021**			

~KEY: Wind direction in degrees from 0 to 360	
Direction	**Degrees**
From North	0, 360
From East	90
From South	180
From West	270

Notes:
(1) PM10 average is based on a 24-hour rolling average period.
(2) Vector wind speed and direction provide a vector mean of all the instantaneous samples of wind direction and wind speed sampled each hour.

Photo 19: The air quality data available to the public on Algoma Steel Inc.'s site for their AAQM network

Note: The data is compiled by ASI. Once the site updates (every 1 – 2 hrs) the "older" data is archived and unavailable to the public and requires an FOI to the MECP. There is also no air quality index.

Source: http://algoma.drdas.cloud/

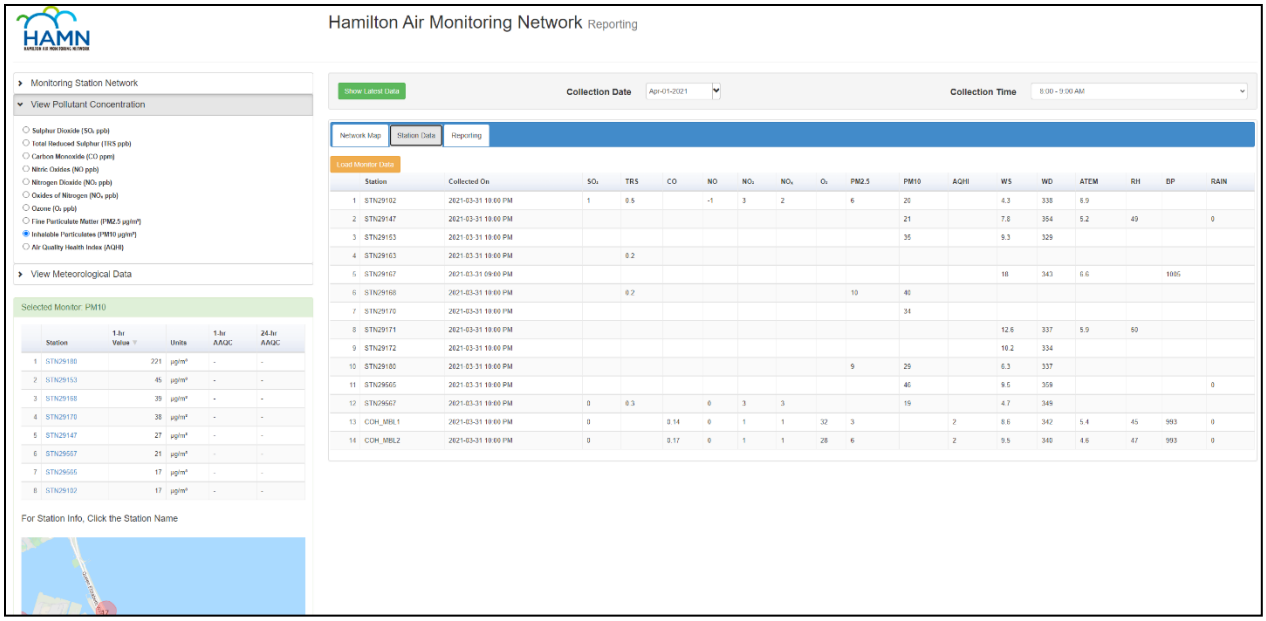

Photo 20: Hamilton Air Network (HAMN) showing more detailed interactive data available to the public.

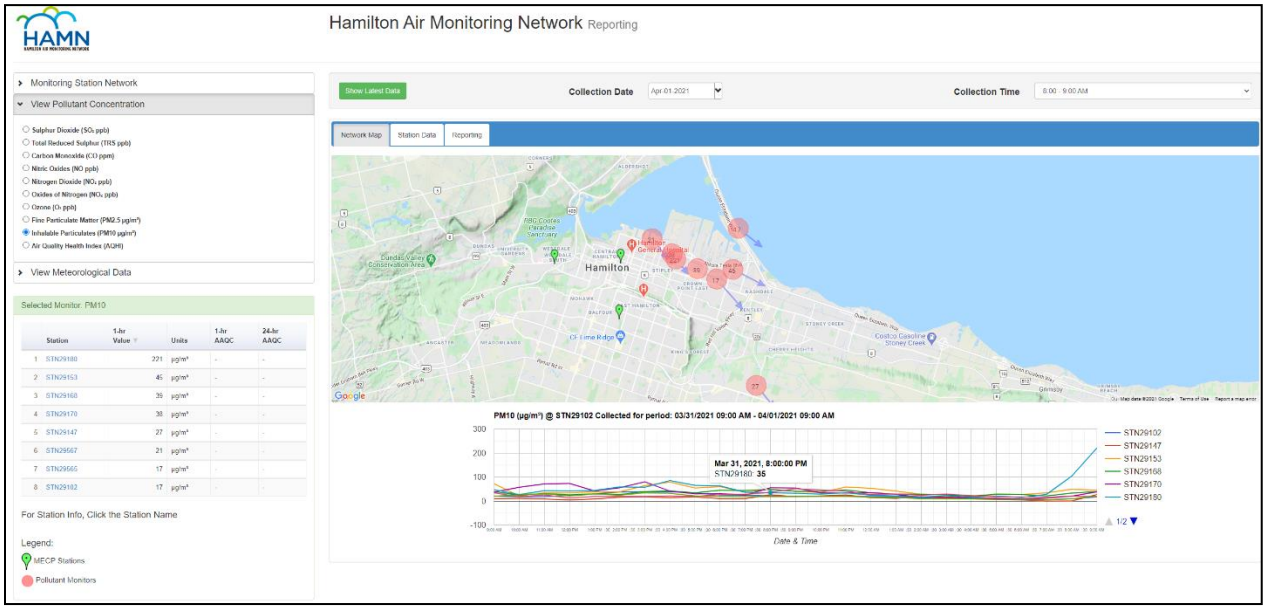

Photo 21: The air quality data is graphically represented and the readings for each monitor is available

Note: HAMN is a third-party company who complies and maintains the data and monitoring devices in Hamilton. There are two monitors that are the responsibility of the MECP that measure PM 10. The HAMN website updates every hour and all previous data is still available to the public for every monitor for multiple time periods and multiple years.

From: [redacted] (MECP)
Sent: May-22-19 1:47 PM
To: [redacted] (MECP) [redacted] @ontario.ca>
Cc: [redacted] (MECP) [redacted] @ontario.ca>; [redacted] (MECP) [redacted] >;
[redacted] @ontario.ca>
Subject: RE: SSM Air Quality Monitoring

[redacted]

Just following up on this email I sent early in the year.

[redacted]

From: [redacted] (MECP)
Sent: January 21, 2019 3:49 PM
To: [redacted] @ontario.ca>
Cc: [redacted] @ontario.ca>; [redacted] @ontario.ca>;
[redacted] @ontario.ca>
Subject: SSM Air Quality Monitoring

1

002252

[redacted]

I would appreciate if TS could undertake a thorough review of all air quality monitoring in SSM, including Algoma Steel's company monitoring and reported results.

It would be great to get a better understanding of the following:

1. Is Algoma Steel's monitoring and reporting reliable and accurate?
2. Is the current monitoring program sufficient to determine the company's impact on local air quality? i.e. is more monitoring required…parameters, locations, etc
3. How the SSM monitoring compares with other Steel Plant locations, i.e. Hamilton
4. Any other recommendations TS staff may have for improving the monitoring of Air Quality in SSM.

The above assessment would greatly assist the District Office, as we regulate the company, and routinely liaise with the public, municipal partners, and local First Nations, (in addition to EAPD) in regards to Algoma's impact on the local airshed.

Thanks in advance,

[redacted]

Sault Ste. Marie Area Office
Ministry of the Environment, Conservation and Parks

[redacted]

Photo 22: Letter on May 22, 2019 from the local MECP requesting MECP Technical Support to assess SSM AAQM network for accuracy and reliability.

/19/2021 Mail - [redacted] - Outlook

RE: Algoma Emissions Update

[redacted]@ontario.ca>

Tue 03/09/2019 8:26 AM

To: [redacted]@hotmail.com>
Cc: [redacted]@ontario.ca>

[redacted]

Please see the attached responses to your questions...

[redacted]

The reasons for the dust fall jars not meeting MECP siting criteria? On January 21, 2019 a request to review air monitoring in SSM was made to our MECP Northern Region Tech Support office to review and determine the level of reliability and accuracy of the current monitoring program for SSM. Due to limited resources and priority ranking, a definitive date for completion has not been set.

Regards,

[redacted]

[redacted]

Ministry of the Environment, Conservation and Parks
70 Foster Drive, Suite 110
Sault Ste. Marie, ON, P6A 6V4

[redacted]

Photo 23: E-mail from September 03, 2019 from the local MECP indicating the reason provided by the MECP Technical Support regarding the request to re-evaluate the SSM AAQM network for its accuracy and reliability.

Recycler wants to double tire waste it microwaves in Sault Ste. Marie

Ellsin Environmental is currently allowed to cook 10 tonnes of tires a day on Yates Ave.

2 days ago B[redacted]

Stock image

Fined two years ago for violating Ontario's *Environmental Protection Act,* a company that recycles tires near Algoma Steel is applying to double the quantity of tire waste it microwaves there.

Ellsin Environmental Ltd. has served notice it wants to increase the daily maximum amount of tires it's allowed to thermally treat at 155 Yates Ave. from 10 tonnes a day to 20 tonnes a day.

If successful, Ellsin's application to the province will expedite the approval process for its production increase by exempting it from requirements of the *Environmental Assessment Act*.

Ellsin uses microwave radiation to cook tire waste, turning it into carbon black, scrap steel, syngas and oil.

It's arguing that potential environmental effects from doubling its Sault production are similar to effects from its existing 10-tonnes-a-day facility, seeing there'll be no new infrastructure and the facility size will remain the same.

If the application is approved, Ellsin will still need amendments to its existing air and waste environmental compliance approvals.

In 2019, the company was convicted of two charges related to altering a waste management system without ministry approval and failing to submit reports within the required time frames.

It was fined $12,000 plus a victim fine surcharge of $3,000.

"Ellsin’s Sault Ste. Marie Site is located in an industrialized area near Algoma Steel and its operation is already regulated by several permits and approvals, including environmental compliance approvals for air, noise, and waste," says a provincial notice of the new application.

"The ministry recognizes that Ellsin completed an assessment of environmental effects from the operation of a commercial facility treating 20 tonnes per day of tire waste in 2018 as part of an environmental screening process. Given this previous work, an exemption from additional environmental assessment requirements is being proposed."

Potential environmental effects listed in the notice are associated with:

- contaminant emissions to the atmosphere from the thermal treatment of tire waste and production of black plastic concentrate, and associated equipment
- noise emissions from the site
- storage of tire waste r[redacted]site
- storage of recovered materials and residual waste generated from thermal treatment and associated processes

"While the thermal treatment of tires generates greenhouse gases, the proposal has the potential to offset greenhouse gas emissions associated with manufacturing of products by replacing virgin raw materials with outputs from the thermal treatment of the tire waste or through use as an alternative source of energy. Ellsin is also looking at the opportunity to generate electricity with the syngas produced from the thermal treatment process," the notice states.

The province is allowing 45 days for comments on the application, ending at 11:59 p.m. on May 3, 2021.

Ellsin is a wholly-owned subsidiary of Whitby, Ont.-based Environmental Waste International Inc. (EWS).

On Monday, EWS announced that an Ontario private company named Torreco Inc. has agreed to invest $7 million to convert Ellsin's Sault operation into a commercial-scale recycling plant.

"EWS will retain a 30 per cent ownership interest in the plant and receive a royalty in perpetuity on the revenue generated from the sale of valuable commodities produced from its environmentally friendly tire recycling process," EWS said in a news release.

"The $7 million will be used to expand and modernize the plant utilizing EWS's latest technology. In exchange for the investment in Ellsin, Torreco will also be granted the right to build three additional waste tire facilities in Ontario over the next five years if it meets certain conditions."

"After investing $7 million, Torreco will own 70 per cent of Ellsin. The construction will require certain regulatory and legal approvals, and there can be no assurances that the entire $7 million will be invested," the news release stated.

https://www.sootoday.com/local-news/recycler-wants-to-double-tire-waste-it-microwaves-in-sault-ste-marie-3566888

Note: The names of individuals were vetted for the purpose of public commenting on ERO proposals

COURT BULLETIN

Tire Recycling Company fined $12,000 for Environmental Protection Act Violations

June 14, 2019
Environment, Conservation and Parks

Convicted - Ellsin Environmental Ltd.

Court Location - Sault Ste. Marie

Description of Offence - The convictions relate to altering a waste management system without ministry approval and failing to submit reports within the required timeframes, as per ministry approval.

Date of Offence - During various periods beginning on or about October 31, 2015 and ending on or about February 27, 2017.

Date of Conviction - June 5, 2019

Penalty Imposed - Ellsin Environmental was convicted of two violations under the Environmental Protection Act and was fined $12,000 plus a victim fine surcharge of $3,000 and was given 90 days to pay the fine.

Background:

- Ellsin Environmental Ltd. holds the patent rights to a tire recycling process, which renders tire components available for reuse in several different applications.
- The company had a waste processing ministry approval for a pilot project at a facility in Sault Ste. Marie. The approved processes were designed and built to test the commercial viability of the company's tire recycling technology.
- On February 27, 2017, the ministry conducted an inspection at the site and identified changes to the approved methods of extracting raw materials for recycling.
- Further inspection indicated that the tire recycling system, as initially designed, was not functioning perfectly and so the company had modified its extraction process to reduce an oil residue that was fouling the reusable carbon material outputs during the recycling process.
- The company also failed to submit quarterly reports on five occasions, and failed to submit their final report in the timeframes required.
- The ministry's Investigations and Enforcement Branch investigated and laid charges resulting in two convictions.

Related Topics

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Media Contacts

Members of the media: Gary Wheeler
Communications Branch
(416) 314-6666

Contact information for the general public:
416-325-4000 or
1-800-565-4923

Photo 24: MECP Court Bulletin regarding fines to Ellsin Environmental Ltd. for violating EPA regulations

Source: https://news.ontario.ca/en/court/52648/tire-recycling-company-fined-12000-for-environmental-protection-act-violations

Photo 25: Annual windrose pattern for the period including the violation on October 31, 2015

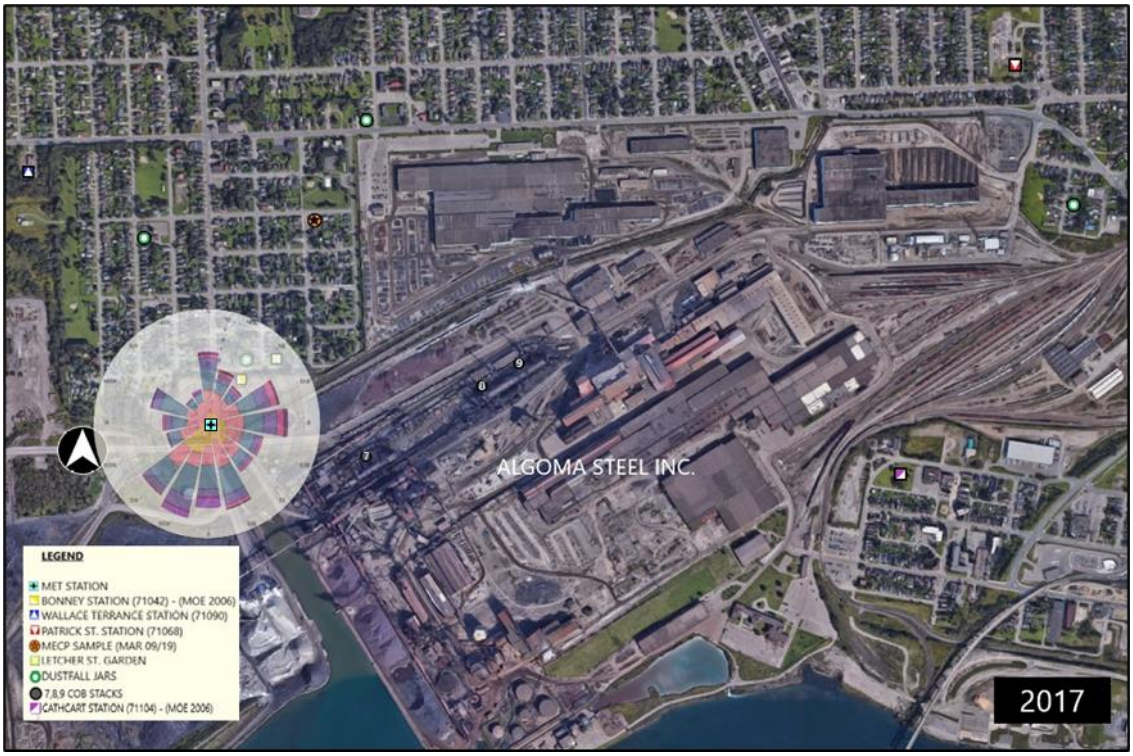


Photo 26: Annual windrose pattern for the period including the violation on February 27, 2017

Note: Windrose diagrams for the periods for the two EPA violations resulting in conviction by MECP

Photo 27: Distance of Ellsin Environmental Ltd. from ASI AAQM stations and MECP PM 2.5 monitor

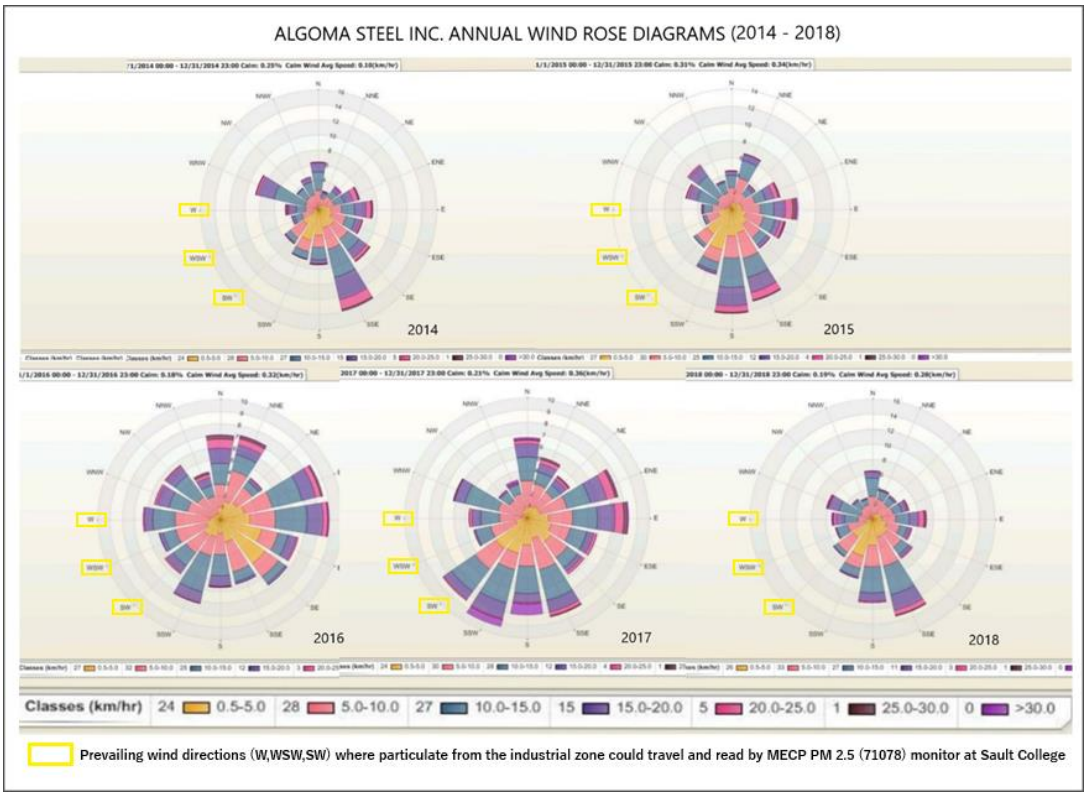


Photo 28: Prevailing winds potential for Ellsin's particulate to register at the MECP PM 2.5 monitor

Note: Prevailing wind patterns from Ellsin Environmental Ltd. are not common in most years and therefore unlikely to be appreciably detected by the MECP PM 2.5 (71078) monitor at Sault College

Environ Sci Technol. 2019 Jul 2; 53(13): 7595–7603.
Published online 2019 Jun 10. doi: 10.1021/acs.est.9b01835

PMCID: PMC6610544
PMID: 31181880

Chlorinated Paraffins in Car Tires Recycled to Rubber Granulates and Playground Tiles

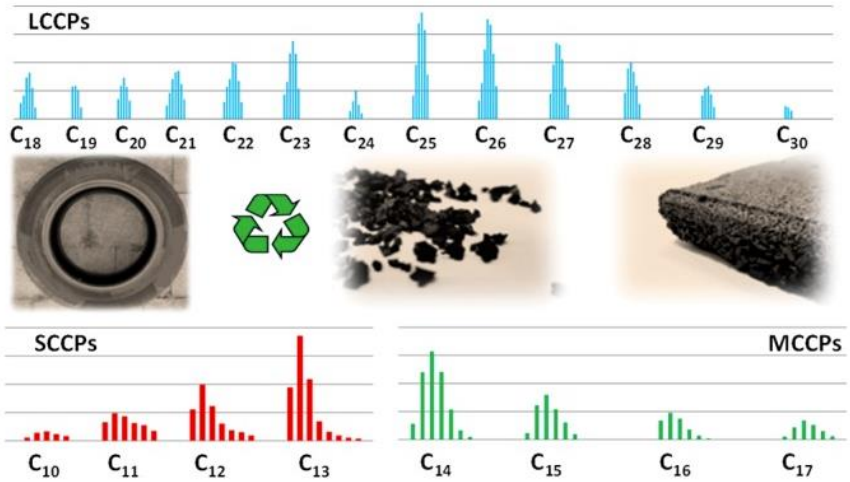
Sicco H. Brandsma,*† Martin Brits,†‡§ Quinn R. Groenewoud,† Martin J. M. van Velzen,† Pim E. G. Leonards,† and Jacob de Boer†

Associated Data

▸ Supplementary Materials

Abstract

Go to:



Chlorinated paraffins (CPs) are used in various products to improve their physicochemical characteristics. Due to recycling, CPs may end up in "new" recycled products. In this study we investigated CPs present in end-of-life car tires that are recycled to rubber granulates used on artificial soccer fields, and playground tiles. The $\sum CP(C_{10}\text{-}C_{30})$ concentrations ranged from 1.5 to 67 μg/g in car tires, 13–67 μg/g in rubber granulates, and 16–74 μg/g in playground tiles. MCCPs were the dominant CP group with an average contribution of 72%. LCCPs up to C_{30}, were detected for the first time in car tires, rubber granulates, and playground tiles. The CPs application in tires is unclear, the low CP concentrations found in this study (<0.007%) could possibly indicate contamination during the manufacturing process. The presence of CPs in the granulates and tiles, in addition to the multiple chemicals already detected, emphasizes the need to further investigate the migration and leaching behavior, in order to assess potential risks of CPs for humans and the environment. The presence of CPs in car tires may be another source of CPs for the environment. The CP volume brought into the environment by tire wear particles (TWP) from car tires in the European Union, is estimated at 2.0–89 tons annually.

Photo 29: Environmental and health effects of chlorinated paraffins (hydrocarbons) from tire recycling

Note: Tire wear particles estimated in the European Union was 2.0 - 89 tons annually. Ellsin Environmental is proposing a commercial operation to process 20 tons of scrap tire material/day or 7,300 tons annually. At 99.9% capture rate, there would be 7.3 tons of particles produced annually.

Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6610544/

Photo 30: The distances to ambient air quality monitors and neighbourhoods.

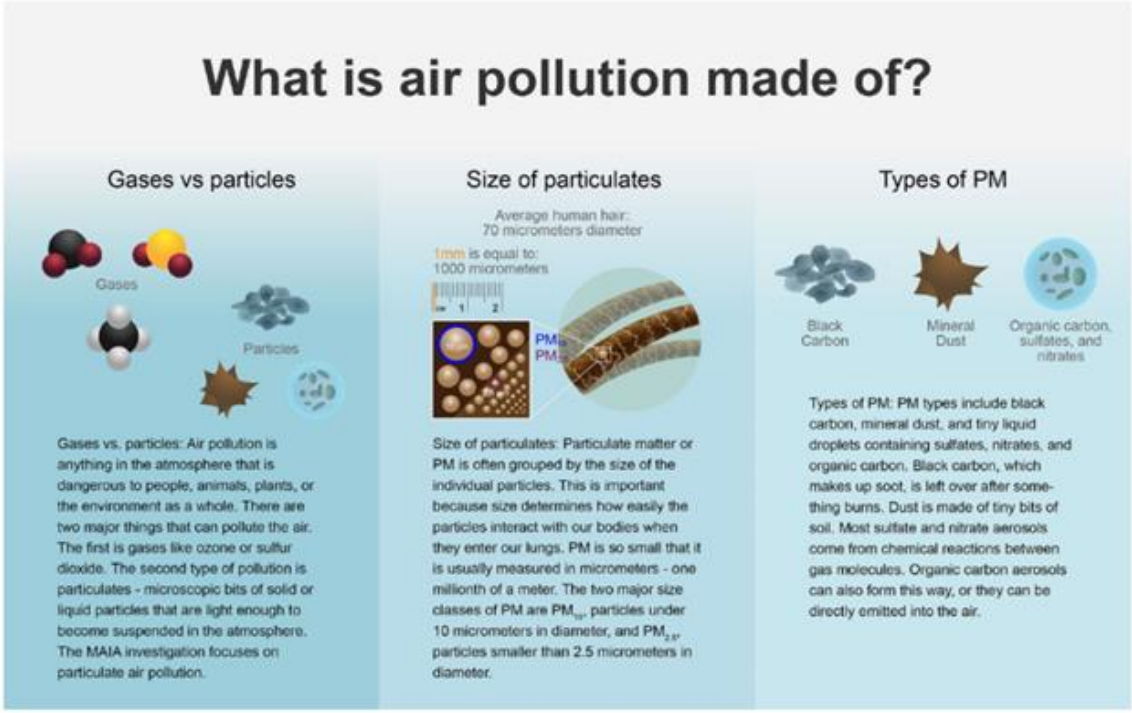
2020 Second Quarter Executive Summary Table
April to June 2020
Algoma Ambient Air Quality Monitoring Program
Sault Ste. Marie, Ontario

2020 (Q2)

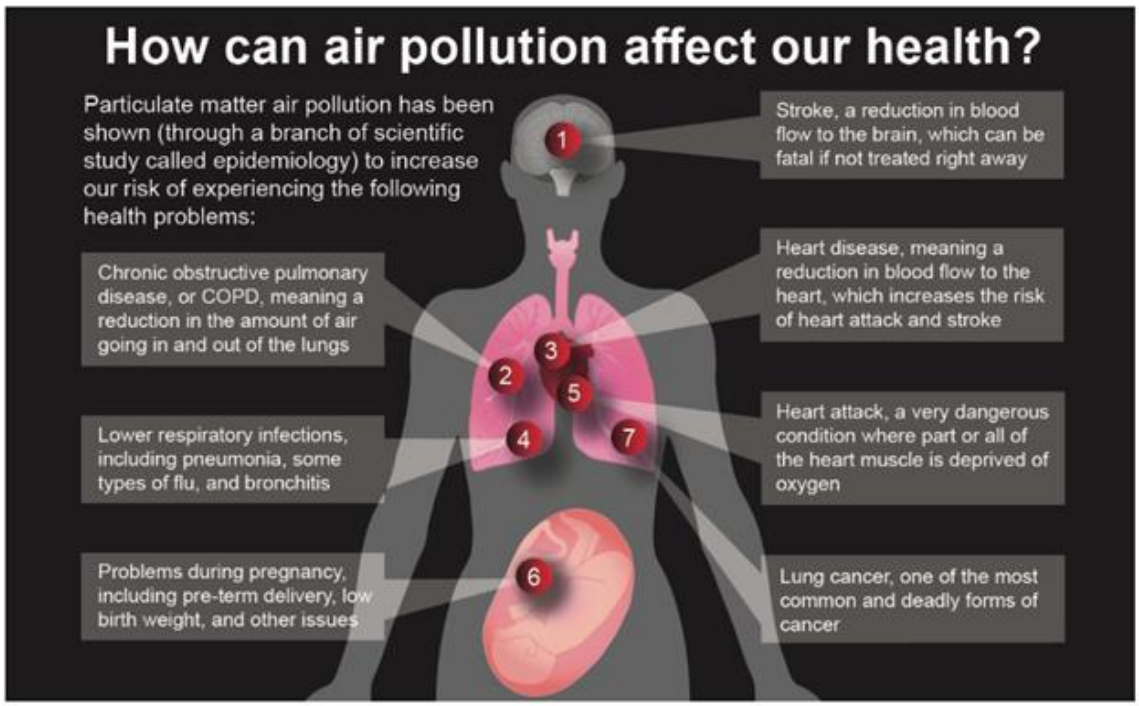
Parameter	Units	Maximum	Minimum	Arithmetic Mean	Standard (1)	Number of Excursions (2)	Guideline, URT AAQC Criteria (1,3,4)
Patrick Street Ambient Air Quality Monitoring Station (71068)							
Continuous Parameters							
Total Reduced Sulphur (TRS) - 24 hour	ppb	1.1	0.0	0.1	5 ppb (24-hour) (5)	0	5 ppb (24-hour)
Total Reduced Sulphur (TRS) - 10 minute	ppb	39.1	0.0	0.1	10 ppb (10-minute) (5)	18	10 ppb (10-minute)
Non-Continuous Parameters							
Particulate Matter less than 10 microns (PM_{10})	$\mu g/m^3$	36.00	5.00	20.53	N/A	N/A	50 (24-hour)
Total Suspended Particulate (TSP) (6)	$\mu g/m^3$	93.00	12.00	44.07	N/A	N/A	N/A
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	$\mu g/m^3$	VARIOUS PARAMETERS, NO EXCURSIONS TO REPORT UNLESS LISTED BELOW					
Totoal Suspended Pariculate Ferric Oxide (7)	$\mu g/m^3$	2.80	<MDL	1.09	25	0	25
Volatile Organic Compounds (VOCs)	$\mu g/m^3$	VARIOUS PARAMETERS, NO EXCURSIONS TO REPORT					
Chloroform	µg/m3	2.1000	<MDL	0.3771	1	1	1
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m^3	0.1000	0.0090	0.0441	N/A	N/A	0.05 (24-hour)
Wallace Terrace Ambient Air Quality Monitoring Station (71090)							
Continuous Parameters							
Total Reduced Sulphur (TRS) - 24 hour	ppb	1.7	0.0	0.4	5 ppb (24-hour) (5)	0	5 ppb (24-hour)
Total Reduced Sulphur (TRS) - 10 minute	ppb	13.1	0.0	0.4	10 ppb (10-minute) (5)	10	10 ppb (10-minute)
Particulate Matter less than 10 microns (PM_{10})	$\mu g/m^3$	58	0	15	N/A	1	50 (24-hour)
Non-Continuous Parameters							
Total Suspended Particulate (TSP) (6)	$\mu g/m^3$	89.00	16.00	46.64	N/A	N/A	N/A
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	$\mu g/m^3$	VARIOUS PARAMETERS, NO EXCURSIONS TO REPORT UNLESS LISTED BELOW					
Total Suspended Particulate Ferric Oxide (7)	$\mu g/m^3$	3.39	<MDL	1.26	25	0	25
Volatile Organic Compounds (VOCs)	$\mu g/m^3$	VARIOUS PARAMETERS, NO EXCURSIONS TO REPORT UNLESS LISTED BELOW					
Chloroform	$\mu g/m^3$	2.0000	<MDL	0.4083	1	1	1
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m^3	1.1000	0.0070	0.3481	N/A	N/A	0.05 (24-hour)
Dustfall Ambient Air Quality Monitoring Stations							
Non-Continuous Parameters							
Bonney Street Dustfall Station (71042)	$g/m^2/30day$	5.51	1.24	3.14	7	0	N/A
Adelaide Street Dustfall Station (71045)	$g/m^2/30day$	0.38	0.16	0.28	7	0	N/A
Spadina Avenue Dustfall Station (71015)	$g/m^2/30day$	4.20	1.80	2.91	7	0	N/A
Wilding Avenue Dustfall Station (71043)	$g/m^2/30day$	2.49	0.34	1.58	7	0	N/A

Photo 31: Executive Summary Table showing Chloroform (Chlorinated Hydrocarbon) which is not an emission seen from the steelmaking industry but from operations such as Ellsin Environmental Ltd.

Source: GHD 2020 Second Quarter Summary Report, Ambient Air Quality Monitoring Program, Algoma Steel Inc. Note: Chloroform and chlorinated hydrocarbons are not parameters that are measured regularly. The Q2 was only quarter that indicated results for Chloroform as a VOC.



Particulate matter air pollution is complex, consisting of various sizes and types, and resulting in differing health effects. Credit: NASA/JPL-Caltech



Particulate matter air pollution is associated with numerous adverse health effects. Credit: NASA/JPL-Caltech

Photo 32: The potential health effects of particulate matter in the air pollution

Source: https://climate.nasa.gov/news/3027/getting-to-the-heart-of-the-particulate-matter/ (Modified)

Photo 33: Modified google map showing monitoring devices relative to sources of contaminants

The continuous particulate monitoring illustrated that TSP concentrations quickly decline as one moves away from the ASI property line. The majority of exceedances of the schedule 1 0.5-hr suspended particulate standard and the highest TSP concentrations were measured at the 71042 Bonney St. location which is on the fence-line of ASI. The 71042 Bonney St. data also showed that storage piles and unpaved areas associated with ASI are the most significant contributor to TSP concentrations at this location.

There were over 1000 exceedances measured of the schedule 1 0.5-hr standard at 71042 Bonney St. The other two sites within the Bayview area (71102 Peter Manzo Pool and 71103 Mike Zuke Park) had approximately 6 to 8 times fewer 0.5-hr suspended particulate exceedances: the number of exceedances at these locations was comparable to those measured at locations outside the Bayview area (i.e., 71100 WESTP, 71101 Second Line West Pump House, 71104 Cathcart).

Through averages calculated from the continuous data, 71042 Bonney St. also recorded the highest number of exceedances of the schedule 3 24-hr suspended particulate standard with 33. The only other location at which the 24-hr standard was exceeded was 71101 Second Line West Pump House. 24-hr TSP averages were highest at Bonney St.: averages at the other Bayview monitoring stations were comparable to those outside Bayview.

Photo 34: Portion of the conclusion of MOE particulate study conducted in 2006*

*Report on Sault Ste. Marie 2006 Particulate Monitoring Special Study, pg. 19

Note: The only current continuous PM10 monitor close ASI's property line near Bayview is the Wallace Terrance Station (71090). Residents closer to the steel plant will experience higher exposure rate than the level indicated from ambient air monitors that are over 1 km away. There is no PM10 or benzene monitoring within the Bayview neighbourhood.

ALGOMA STEEL INC.
EMISSIONS SUMMARY AND DISPERSION MODELLING (ESDM)

PRODUCTION (TONNES)

	2015 (1)	2016 (1)	2017 (1)	2018 (1)	2019	2020
Cokemaking	1,013,760	1,013,760	1,013,760	1,013,760	766,146	791,371
Ironmaking	4,158,732	4,158,732	4,158,732	4,158,732	1,978,245	1,888,241
Steelmaking	5,211,322	5,211,322	5,211,322	5,211,322	2,264,311	2,139,269

BENZENE (VOCs)

	2015	2016	2017	2018	2019	2020
Benzene	5.94	5.76	3.94	4.39	4.67	3.57
Limit (ug/m3)	0.5	0.5	0.45	5.5 (2)	5.5 (2)	2.2 (5)
% POI	1187%	1152%	875.75%	79.74%	84.91%	162.29%

BENZO-a-PYRENE (PAHs)

	2015	2016	2017	2018	2019	2020
Benzo-a-pyrene	0.01128	0.01121	0.00312	0.00368	0.00525	0.00477
Limit (ug/m3)	0.00001	0.00001	0.00001	0.011 (3)	0.011 (3)	0.004 (5)
% POI	112000%	112100%	31200%	33.45%	47.72%	119.25%

PARTICULATE MATTER (PM)

	2015	2016	2017	2018	2019	2020
PM 2.5	52.57	52.04	51.36	72.16	37.84	33.89
Limit (ug/m3)	25.00	25.00	25.00	25.00	25.00	25.00
% POI	210.29%	208.16%	205.42%	288.66%	151.37%	135.57%
PM 10	76.39	74.5	76.79	96.22	64.81	63.97
Limit (ug/m3)	50.00	50.00	50.00	50.00	50.00	50.00
% POI	152.78%	149.00%	153.59%	192.43%	129.61%	127.94%
PM 44	151.98	149.92	147.07	148.85	116.41	102.21
Limit (ug/m3)	120	120	120	164 (4)	127 (4)	127 (4)
% POI	126.65%	124.93%	122.56%	90.76%	91.66%	80.48%

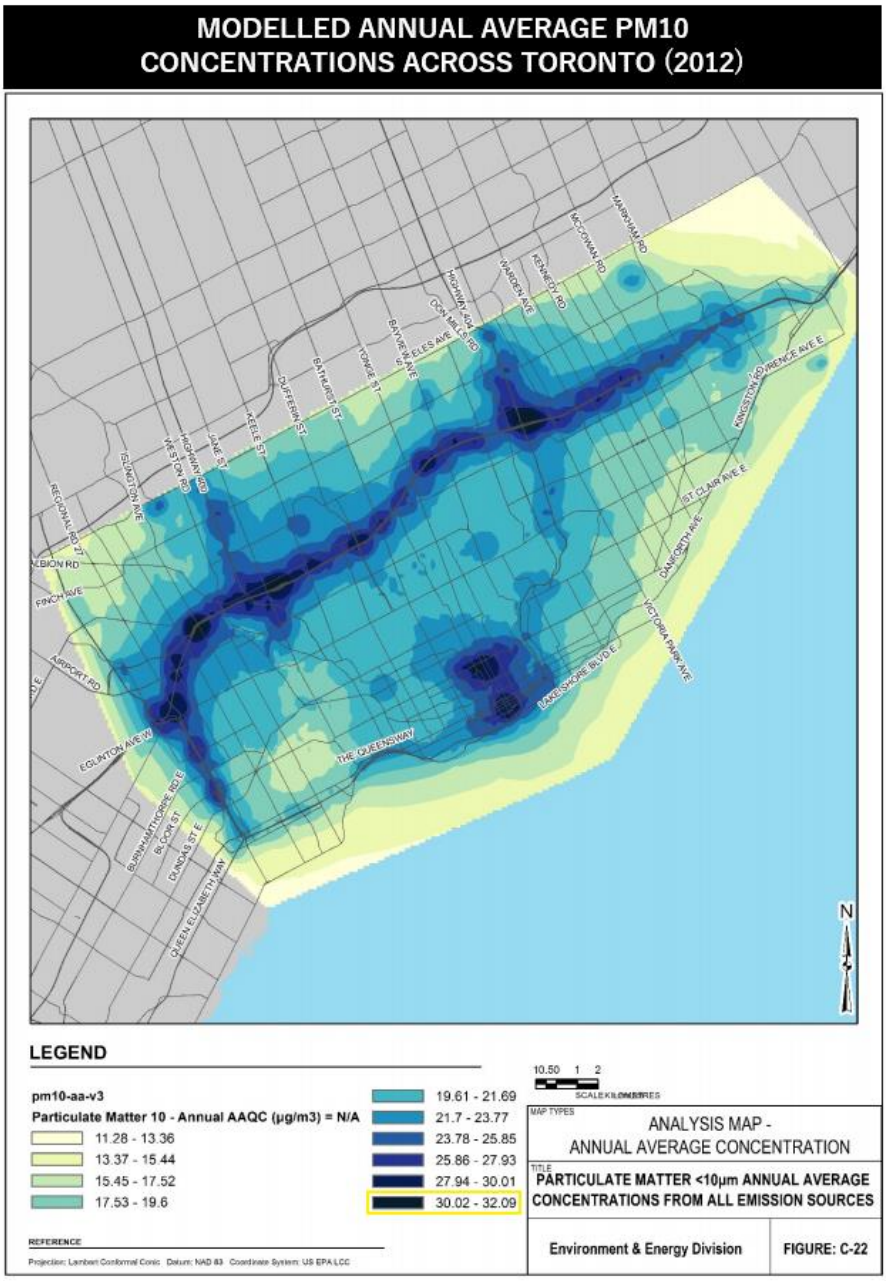
Notes:

(1) Estimated production levels
(2) Site-Specific Standard - Approved Increase in MECP Limit from 0.50 ug/m3 to 5.5 ug/m3
(3) Site-Specific Standard - Approved increase in MECP Limit from 0.00001 ug/m3 to 0.011 ug/m3
(4) Site-Specific Standard - Approved increase in MECP Limit from 120 ug/m3
(5) Current Site-Specific Standard (SSS)

*All data is compiled from ASI ESDMs and is modelled, therefore data will vary with production levels.

Photo 35: Summary of 2015-2020 ASI Emission Summary and Dispersion Modelling (ESDM) reports

Note: ASI's PM 2.5 and PM 10 emissions were modelled with lower production levels in 2019 and 2020, but both limits still exceeded the MECP limit. ASI's modelled PM 2.5 emissions in 2020 was 33.89 ug/m^3 but the modelled background level for Ellsin Environmental Ltd. proposal was 10.6 ug/m^3.

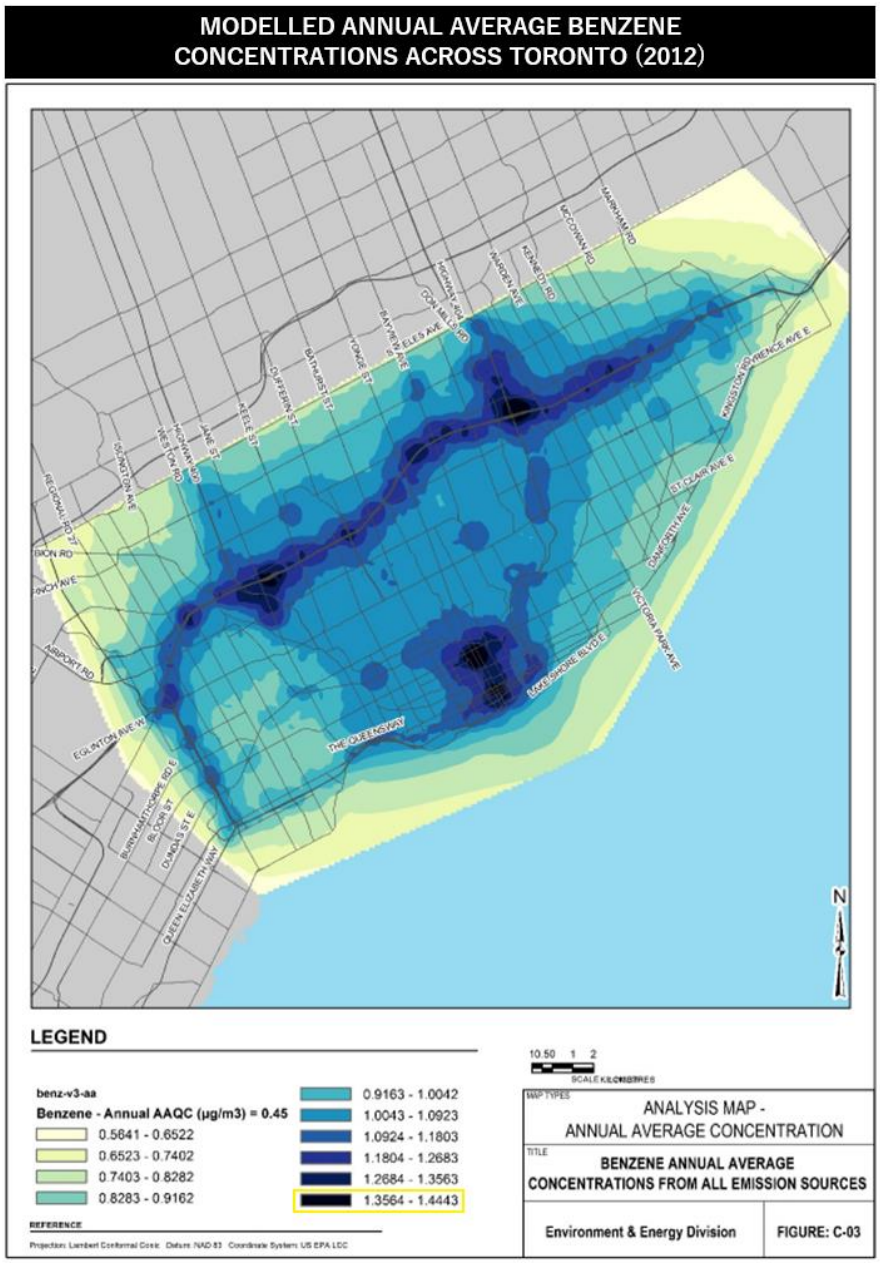


ASI Modelled PM 10 Emissions					
2015	2016	2017	2018	2019	2020
76.39	74.50	76.79	96.22	64.81	63.97
* All data compiled from ASI ESDMs					

Photo 36: Modelled traffic-related annual average PM 10 concentrations in Toronto (2012 data)

Source: https://www.toronto.ca/legdocs/mmis/2017/hl/bgrd/backgroundfile-108070.pdf

Note: The maximum modelled average PM10 concentration for the traffic study was 32.09 ug/m^3 compared to the modelled PM 10 emissions from ASI of 63.97 ug/m^3 in their 2020 ESDM.



ASI Modelled Benzene Emissions					
2015	2016	2017	2018	2019	2020
5.94	5.76	3.94	4.39	4.67	3.57
* All data compiled from ASI ESDMs					

Photo 37: Modelled traffic-related annual average benzene concentrations in Toronto (2012 data)

Source: https://www.toronto.ca/legdocs/mmis/2017/hl/bgrd/backgroundfile-108070.pdf

Note: The maximum modelled average benzene concentration for the traffic study was 1.44 ug/m^3 compared to the modelled benzene emissions from ASI of 3.57 ug/m^3 in their 2020 ESDM.

Photo 38: High particulate haze from emissions emanating from ASI on July 01, 2020

Local Importance

- Higher incidence of Follicular Lymphoma within 5 km of industry (22)
- Acute Myeloid leukemia rate significantly higher for Sault Ste. Marie (23)
  - National average rate 30.61 per 1,000,000 persons/year
  - Sault Ste Marie's rate was 44.91
    - P6C area code had a rate of 65.1

Photo 39: P6C area code has higher rates of acute myeloid leukemia than local national rates (*Slide 25)

* Ferrochrome in Sault Ste. Marie, Dr. [redacted] (Contributors: Dr. [redacted], Dr. [redacted]), 2019.

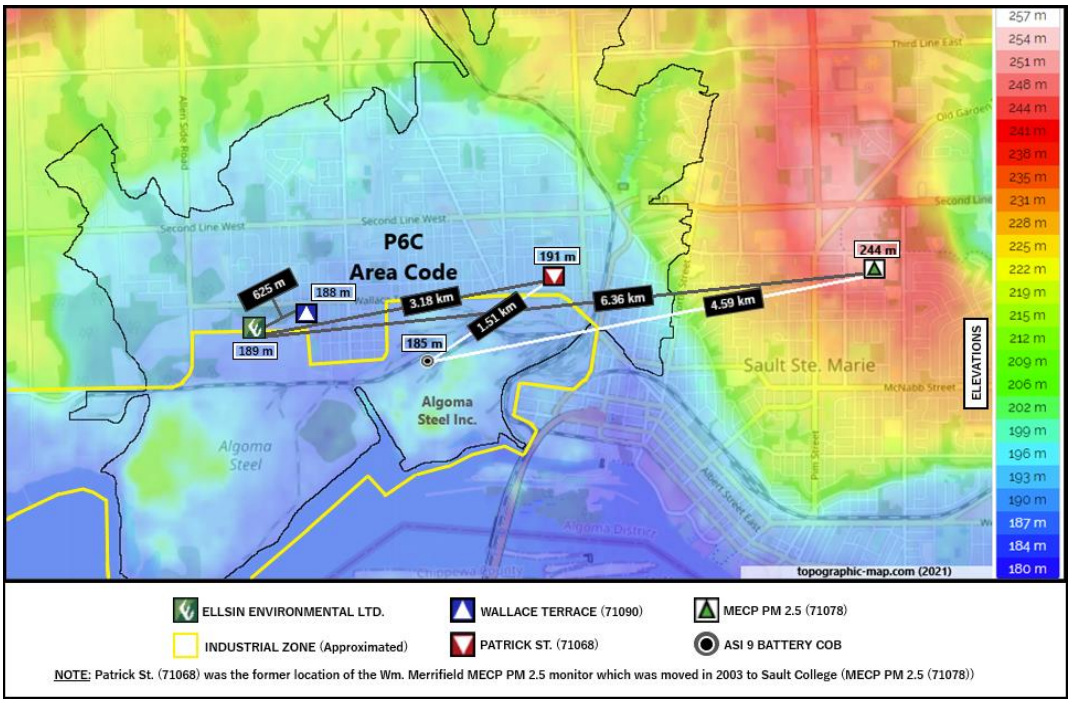


Photo 40: Elevation of the old MECP PM 2.5 ambient air monitoring site at Patrick St. (71068) compared to current location at Sault College relative to the P6C Area Code. (approximated from Google Image)

Note: The P6C Area Code falls within a lower lying elevation (valley) compared to the current MECP monitor located at a higher elevation (hilltop). Emissions tend to accumulate at lower elevations due to many factors including temperature inversions, low winds and poor dispersion of fugitive emissions from sources like coke oven doors, lid leaks as well as pushing/charging emissions. (Modified Images)

/1/2021 Mail - [redacted] - Outlook

[redacted]

9.) What years where the Wallace Terrace and Patrick St. Stations installed at their current locations?

The Bonney Street air monitoring station was relocated to the Wallace Terrace location in 2006.

The Patrick Street station was originally established as an air quality index (AQI) station to monitor ambient air quality in Sault Ste Marie in 1987. In 2003 the AQI instrumentation was relocated to Sault College and some instrumentation was left at Patrick Street to continue monitoring emissions from Algoma Steel.

10.) Did the Wallace Terrace station ever have a meteorological station (or component) similar to the station at Gate 4 and Patrick St., or are the wind speed and direction calculated by another part of the air monitor?

The Wallace Terrace site has not been used as a meteorological station in the past. Wind speed and direction were measured at the Patrick Street station before the third quarter of 2006, and the Gate 4 station has been providing wind speed and direction since the third quarter of 2006.

[redacted]

Sault Ste. Marie Area Office
Ministry of the Environment, Conservation and Parks

[redacted]

Photo 41: Portion of an e-mail from the local MECP regarding the removal of the PM 2.5 (Wm. Merrifield) monitor from its original location at Patrick St. (71068) to Sault College (71078)

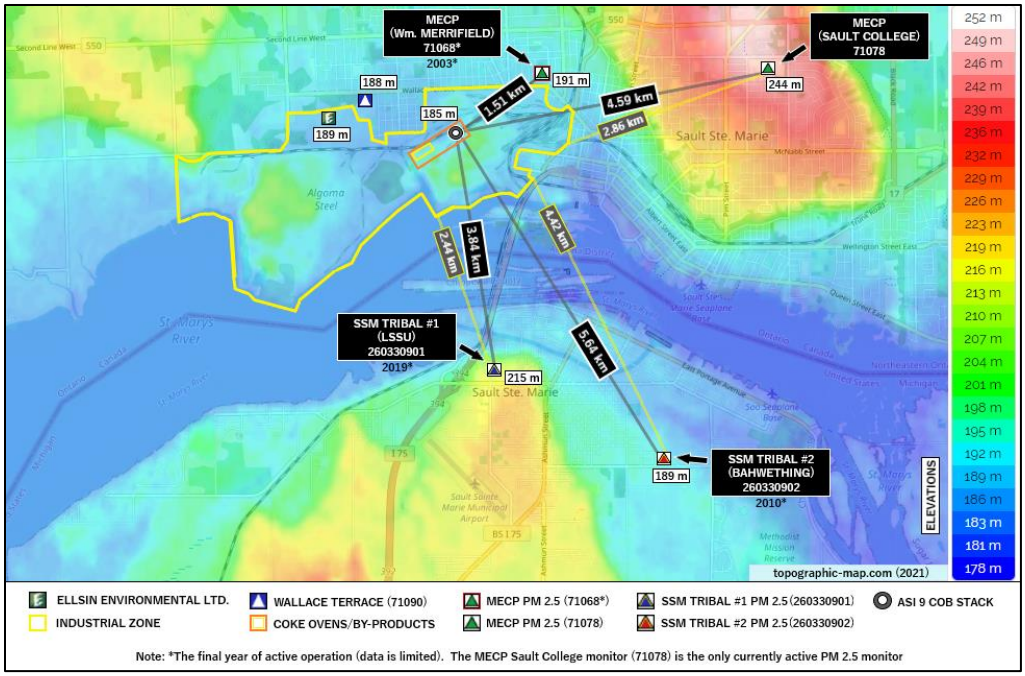


Photo 42: Elevations and distance of PM 2.5 monitors from the industry

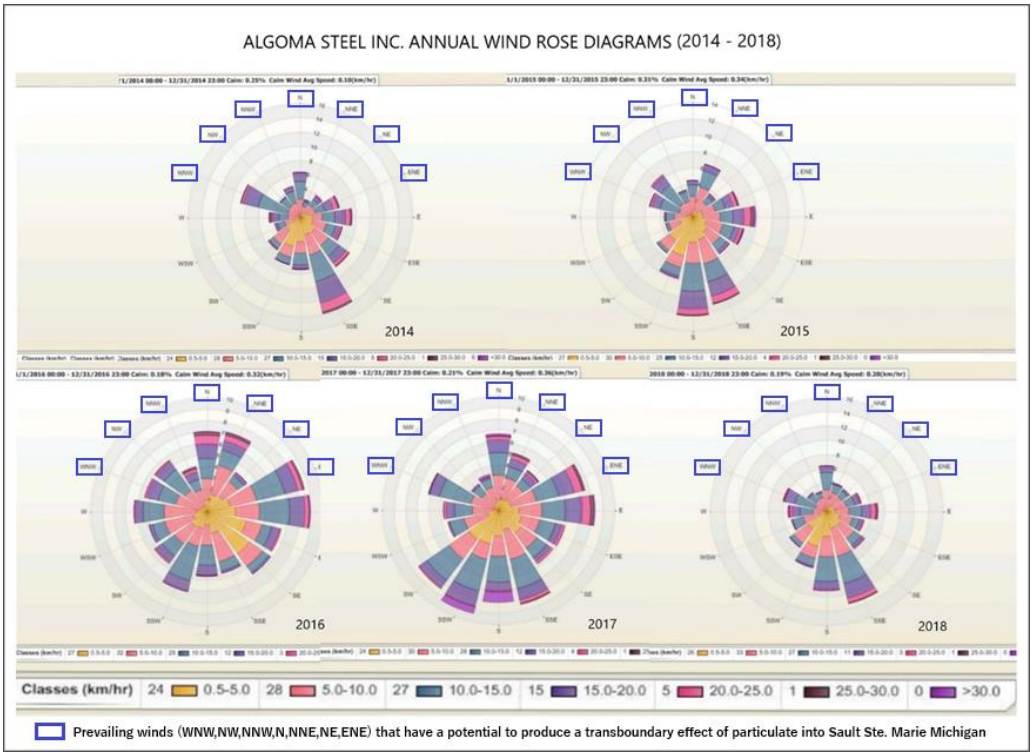


Photo 43: Windrose diagrams showing the influence of prevailing winds on US PM 2.5 AAQM stations

Note: Sault Michigan has a population of 13,591 and no heavy industry close to its monitors. Northerly prevailing winds from the industrial sector in Sault ON will have the potential to create transboundary pollution impacting the PM 2.5 readings of monitors in Sault Michigan.

CANADA AND UNITED STATES
PM 2.5 DATA COMPARISON
(2003 - 2010)

Year	Station No.	City	Location	Valid Hrs	10th%	30th%	50th%	70th%	90th%	99th%	Mean	1-Hr Max	24-Hr Max	24hr Exc.
2010	71078	Sault ON	Sault College	8670	0	1	3	5	10	19	4.1	39	16	0
2009	71078	Sault ON	Sault College	8639	0	1	3	5	9	20	4.0	59	25	0
2008	71078	Sault ON	Sault College	8707	0	2	3	5	10	20	4.4	41	20	0
2007	71078	Sault ON	Sault College	8487	0	2	3	6	13	30	5.3	50	33	2
2006	71078	Sault ON	Sault College	8714	0	2	3	6	12	25	5.2	51	30	1
2005	71078	Sault ON	Sault College	8729	0	1	3	6	14	35	5.4	107	46	2
2004	71078	Sault ON	Sault College	8719	0	1	2	5	12	29	4.5	131	34	1
2003	71068	Sault ON	Wm. Merrifield	4076	1	2	5	9	21	39	INS	65	39	4

INS indicates there was insufficient data in any one quarter to calculate a valid annual mean. Note: All data is in ug/m3

PM 2.5 meter (71068, Wm. Merrifield) was moved to Sault College in 2004, data is limited to only 4076 hours in 2003

Year	Site No.	City	Location	Obsv.	1st Max	2nd Max	3rd Max	4th Max	98th%	Mean	24-Hr Max
2010	260330901	Sault MI	LSSU (1)	33	42.6	38.7	31.4	31	43	15.7*	42.6
2009	260330901	Sault MI	LSSU (1)	61	52.7	35.1	34.6	33.6	35	14.7*	52.7
2008	260330901	Sault MI	LSSU (1)	84	42.3	32.3	30.6	29.2	32	10.9*	42.3
2007	260330901	Sault MI	LSSU (1)	97	36.5	30.5	27	25.8	31	9.8*	36.5
2006	260330901	Sault MI	LSSU (1)	84	48.1	36.1	27.8	21.9	36	7.6*	48.1
2005	260330901	Sault MI	LSSU (1)	118	33.2	28.3	25.1	23.4	25	8.2	33.2
2004	260330901	Sault MI	LSSU (1)	114	31.5	25.5	22.3	21.8	22	7.2	31.5
2003	260330901	Sault MI	LSSU (1)	111	40.8	26.6	26.3	25.3	26	8.6	40.8
2010	260330901	Sault MI	LSSU (2)	8	22.1	13.2	13	11.4	22	11.4*	22.1
2009	260330901	Sault MI	LSSU (2)	51	33.4	31.1	28.9	26.3	31	12.3*	33.4
2008	260330901	Sault MI	LSSU (2)	80	50.6	25.8	25.5	23.2	26	10.6*	50.6
2007	260330901	Sault MI	LSSU (2)	86	49.7	34.3	27.2	26	34	9.4*	49.7
2006	260330901	Sault MI	LSSU (2)	85	33.6	30.1	27.1	21.9	30	7.1*	33.6
2005	260330901	Sault MI	LSSU (2)	42	28.3	23.7	20.6	19.5	28	9.3*	28.3
2004	260330901	Sault MI	LSSU (2)	58	18.2	15.4	15.4	15.2	15	6.3	18.2
2003	260330901	Sault MI	LSSU (2)	46	38.3	27.3	25.7	21.7	38	9.4*	38.3
2010	260330902	Sault MI	Bahwething	10	20.7	12.9	10.7	8.9	21	7.6*	20.7
2009	260330902	Sault MI	Bahwething	22	37.3	18.9	18.1	17.9	37	9.6*	37.3
2008	260330902	Sault MI	Bahwething	41	32.8	31.8	28.2	25.2	33	11.5*	32.8
2007	260330902	Sault MI	Bahwething	44	26	25.9	21.7	19.1	26	7.6*	26
2006	260330902	Sault MI	Bahwething	47	33.2	23.1	21.9	18.6	33	6.8*	33.2
2005	260330902	Sault MI	Bahwething	119	30	28.5	25.1	22.7	25	7.9	30
2004	260330902	Sault MI	Bahwething	114	32.4	25.1	23.2	21.3	23	6.7	32.4
2003	260330902	Sault MI	Bahwething	113	43.7	28.6	25.4	25.2	25	8.1	43.7

The * indicates the mean does not satisfy minimum data completeness criteria. Note: All data is in ug/m3

Site No. 260330901 (LSSU) notes monitors (1) and (2) https://www.epa.gov/outdoor-air-quality-data/monitor-values-report

MECP (71068) - 1987-2003
MECP (71078) - 2004-Present
LSSU (260330901) (1)- 2001-2017
LSSU (260330901) (2)- 2001-2017
BAHWETHING (260330902) - 2001-2010

Photo 44: Comparison of data from PM 2.5 monitors in Sault ON and Sault MI.

Note: The Industrial zone is in a lower lying elevation (valley) compared to the current MECP monitor located at a higher elevation (hilltop). Emissions tend to accumulate at lower elevations due to many factors including temperature inversions, low winds, poor dispersion from fugitive emissions from sources such as coke oven doors, lid leaks, short stacks as well as cokemaking pushing/charging operations. Transboundary pollution will likely impact meters at distances and elevations in Sault MI due to higher frequencies and durations of prevailing winds originating in the north and travelling southerly.

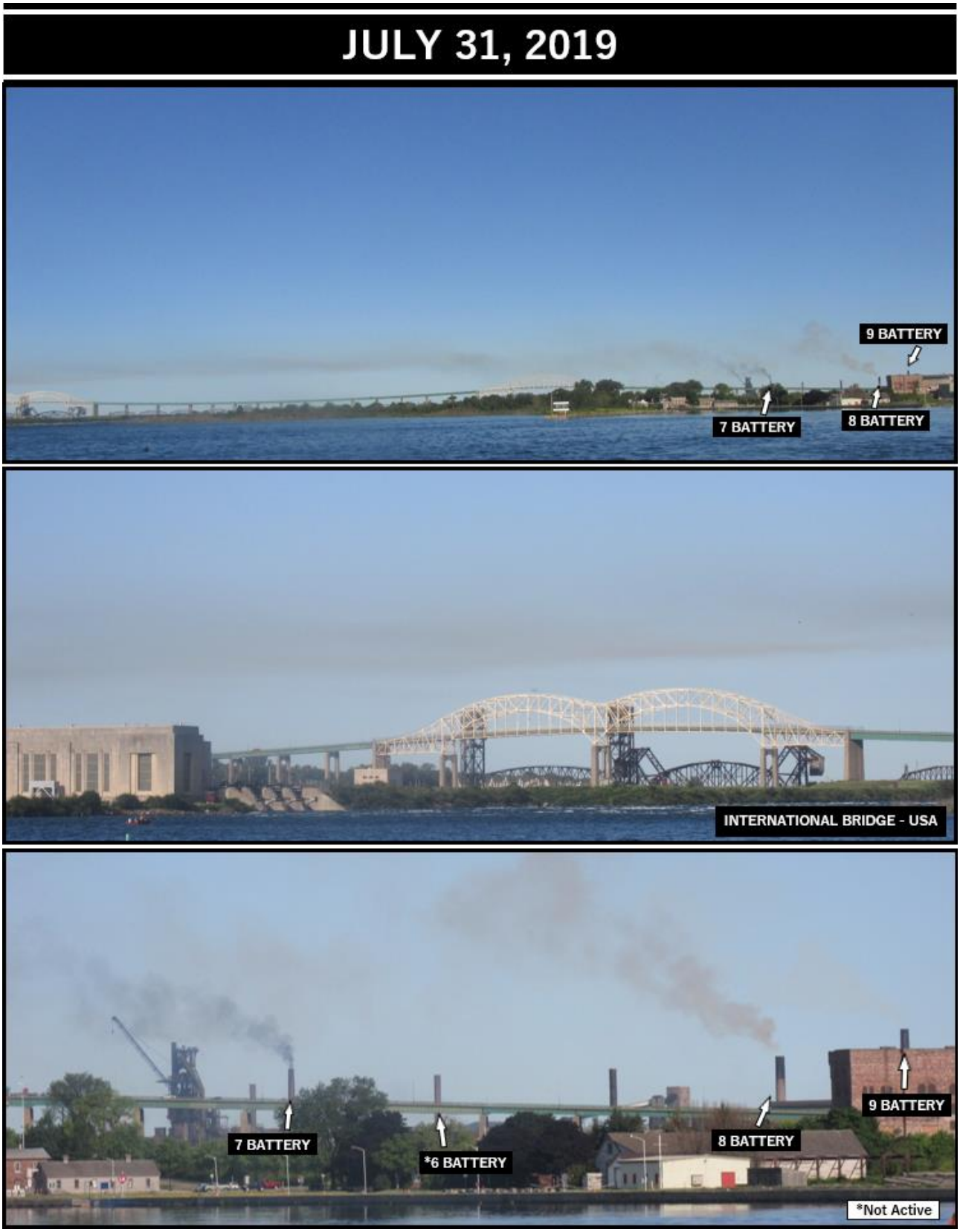


Photo 45: High particulate haze from emissions emanating from ASI travelling south to Sault Michigan

Photo 46: High particulate haze visible in Sault Michigan from across the St. Mary's River in ON.

Photo 47: High particulate haze visible in Sault Michigan from across the boardwalk in Sault ON.

Photo 48: High particulate haze from emissions emanating from ASI travelling south to Sault Michigan

Photo 49: High particulate haze visible in Sault Michigan from across the St. Mary's River in ON.

Heavy iron oxide emission from ASI's No. 7 Blast furnace heading south to Sault Michigan

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Environmental Registry of Ontario

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The ERO proposal 019-3370 to...

Comment on	Proposal for a new regulation that would allow Ellsin Environmental to increase the amount of tires they can thermally treat daily
ERO number	019-3370
Comment ID	54489
Commenting on behalf of	Individual
Comment status	Comment approved More about comment statuses

Comment

The ERO proposal 019-3370 to permit Ellsin Environmental Ltd. to begin a commercial scale operation from its current operations, should not be granted by the MECP at this time. The proposal requires a more thorough evaluation of the ASI AAQM network and the MECP PM 2.5 monitor at Sault College in providing acceptable background data. There have been consistent concerns from the public for over a decade regarding the efficiency of the current air quality network at characterizing particulate levels closer to the industrial sector. Since the removal of the PM 2.5 monitor from the Patrick St. site in 2003, there has been no reliable measured data of the ambient air concentrations of PM 2.5 that could reasonably approximate the background levels in areas closer to the industrial sector.

A fundamental consideration for approval should require that background data be robust and collected from an ambient air quality network that the local MECP can be confident is reliable and accurate in keeping residents safe and protecting the natural environment. On January 21, 2019, a request was made by the local MECP office for the MECP Technical Support to assess the accuracy and reliability of the current AAQM network in Sault Ste Marie. On September 03, 2019, the local ministry provided a response from MECP Technical Support based on that request stating, "Due to limited resources and priority ranking, a definitive date for completion has not been set". In ACLC meetings, it was stated they are in talks to consider adding monitoring devices on the east side of ASI, but it would require the development of a technical standard.

Since emissions are modelled, the current AAQM must be able to more conclusively demonstrate that predicted levels reflect the actual air quality around the industrial sector. Air quality data from ASI's AAQM network accessible to residents living around the industrial sector is limited and does not include an air quality index. An air quality index to advise residents on the overall air quality cannot be provided without a monitor that measures PM 2.5 levels and the additional parameters once provided by the former Patrick St. location (Wm. Merrifield) near the industrial sector.

There is only one monitor in the ASI AAQM network that continuously measures PM 10. Since there is no correlation between the PM 10 levels and PM 2.5 levels, the readings and recommended air