

# PUBLIC HEALTH CONCERNS

Role of Algoma Public Health

## ABSTRACT

Public concerns regarding sources of industrial emissions affecting air quality and public health. The role of Algoma Public Health (APH) in evaluating the impacts from these sources and addressing public health concerns.

## Selva Rasaiah

Submitted to: Dr. Jennifer Loo Acting Medical Officer of Health & CEO Algoma Public Health

Submitted by: Selva Rasaiah

Date Submitted: June 15, 2021

\*Original Document Submitted: April 25, 2021

#### Dear Dr. Loo,

Thank you for your reply. Health-related concerns from residents regarding industrial emissions have been a long-standing issue in Sault Ste Marie. Concerns regarding the accuracy and efficiency of the monitoring network around the industrial sector have been questioned by residents for over 15 years. I understand the limitations imposed on your staff due to the COVID-19 epidemic, but the questions and concerns raised pre-date this issue. Chris Spooney (APH) was included in an e-mail on August 11, 2019 to M.P. Terry Sheehan regarding concerns over the March 09, 2019 emissions event at Algoma Steel Inc. (ASI). Our community depends on our public health officers being familiar with air quality issues, educating the public and assuring that health concerns are openly addressed. APH did communicate with the Ministry of the Environment, Conservation and Parks (MECP) regarding the details but did not convey this to the public. No explanation or assurance was provided by APH to the residents around the area despite potential health impacts and concerns. Residents received no opportunity to discuss their concerns and were unsure who to contact. There are no comments in Algoma Community Liaison Committee (ACLC) meeting minutes for at least two years by APH representatives which demonstrate an active participation in discussions regarding public concerns from ASI emissions and operations. It is unclear the active role APH plays in protecting public health in addressing issues related to air quality.

Since total benzene emissions are mathematically modelled, it is important to know the levels that are measured by the monitoring devices in the ambient air quality monitoring network (AAQM). As our public health agency, this would be something that APH representatives should be familiar with since it is a carcinogen and concern to the health of our community. To date, ASI and the MECP have not provided an explanation why it is not listed on the GHD (third-party) executive summaries for many quarters. There is an expectation that your Environmental Health team members would take an active role by acquiring an explanation by ASI and the MECP. Liliana Bressan (APH) has been extremely helpful in two initial e-mails by providing information on ASI emissions data and APH's role but there has been no update from APH since my e-mail on March 05, 2021.

In your presentation at the Sault College in 2019, you were hesitant to discuss the potential contribution of industrial emissions on the health of the residents in our community. Urbanized area with industries emitting known carcinogens like ASI, would have higher levels of these contaminants. In a presentation at Sault College in 2019, you acknowledged you do not have specific data for the Sault and the population was too small to draw conclusions, but you stated, "there's very little reason for us to think that Sault Ste. Marie is going to vary dramatically from those numbers". This is a contradictory statement which has no factual basis with supporting data, and therefore is a misleading statement.

The public must have the confidence and assurance that our local public health unit is considering all sources with any potential health impacts to our community. It is particularly important that since we have heavy industry close to our downtown and many residential neighbourhoods, that health concerns from residents regarding air quality are addressed. These issues not only impact physical health but mental health, as residents are becoming increasingly frustrated by the level of accountability by the city, APH and the MECP. We must have a public health agency that will effectively manage all health-related concerns as we move towards a future beyond the COVID-19 epidemic.

Thank you,

Selva

#### **RE: ASI Monitoring Stations**

Fred.Post@algoma.com <Fred.Post@algoma.com>

Mon 19/08/2019 10:07 AM

To: selvarasaiah@hotmail.com <selvarasaiah@hotmail.com>; Lori.Greco@ontario.ca <Lori.Greco@ontario.ca>; Chris.Galizia@algoma.com <Chris.Galizia@algoma.com>

Hello Mr. Rasaiah,

The two comprehensive air monitoring station are located at Wallace Terrace and Patrick St. I have placed red circles around the two locations in the screenshot below. You can see the parameters that are measured at those stations listed on that same slide shown below. Only the Wallace Terrace Station monitors for PM10.

Recent environmental incidents can be viewed at the following link: https://www.algoma.com/environment/reporting/

# **Ambient Air Quality Monitoring Program**

## Algoma operates six air monitoring stations

- · 4 dust fall monitoring sites
- 2 comprehensive monitoring sites

## MECP defined monitoring schedule

- VOC's and PAH's every 12<sup>th</sup> day
- PM10, TSP and metals every 6<sup>th</sup> day
- Dust fall continuous for 30 days
- PM10 continuous, hourly
- · TRS continuous, every minute



 

 Regards Fred

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 Disclaimer: This email is subject to a disclaimer. To view, please click here

 From: Selva Rasaiah [mailto:selvarasaiah@hotmail.com]

 Sent: Monday, August 19, 2019 8:59 AM

 To: Lori Greco; Post, Fred; Galizia, Chris

 Subject: ASI Monitoring Stations

 \* This email originated from outside of Algoma. Please exercise caution \*

Photo 1: E-mail from Fred Post regarding locations and parameters measured by ASI's AAQM network.



Photo 2: Current Algoma Steel Inc. Ambient Air Quality Network (AAQM)



Photo 3: Hamilton Air Network (HAMN). PM 2.5 monitors (circled in yellow) and PM 10\* (Modified)

Source: http://www.hamnair.ca/Hamilton-Air-Quality-Monitoring-Network.aspx

**Note**: Wallace Terrace station (71090) has the only continuous monitor for PM 10. There are no monitoring devices of any type on most of the east and all of the south side of Algoma Steel Inc.



Photo 4: Ontario government health information on the health effects from fine particulate matter.

Source: http://www.airqualityontario.com/science/pollutants/particulates.php



Source: https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm



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



Source: <u>https://www.health.utah.gov/utahair/pollutants/PM/#gsc.tab=0</u> (Modified)



Photo 6: ACLC Public member, David Trowbridge emphasizes the effects of PM 2.5.

Source: ACLC Meeting #8 minutes, February 15, 2012, pgs. 3,4.

## ACLC MEETING #35 MINUTES December 08, 2020

1	Fred Post – The 2.2 ug/m3 was based on implementing controls on all remaining sources. It is therefore likely that Algoma will not achieve the 2.2 ug/m3 until those projects are complete.
1	David Trowbridge – Why would air standards be set if they cannot be achieved?
	Bruce Gillies - The MECP made a decision to set air standards at levels where there would be no adverse effect on health. This allows industries that can meet them to do so without any additional work needed. Where facilities can't meet the standards, SSS's provide facilities a compliance option while also ensuring continuous improvements are being made.
-	David Trowbridge – Algoma could potentially be at the same levels for the next 2 years. What is the rationale for this?
-	Bruce Gillies – The extension will allow enough time for a technical standard to be developed and for facilities to register.
	Fred Post – The SSS's came into effect in 2015 and limits on coke oven leak rates were progressively phased in over the subsequent five years. The most stringent leak rate limits just came into effect in 2020 and Algoma is in compliance. These limits were determined to be the best available controls which are the same limits that are in place in the USA. The Technical Standard development process will evaluate if additional technologies or practices become available to further reduce emissions from existing facilities.
	David Trowbridge – There was a press release yesterday where the US EPA was reducing the limits for particulate matter less than 2.5 microns (PM2.5) from 12 ug/m3 to 9 ug/m3. The USA has half of Ontario's limit for PM2.5. Why is PM2.5 not being regulated by the MECP?
	Fred Post – This was discussed at a previous CLC meeting where Scott Grant from the MECP explained that PM2.5 forms as a result of multiple other contaminants in the atmosphere including but not limited to NOx and SOx. It is impossible to regulate PM2.5 as a whole without regulating the contaminants that form it. Therefore the MECP's approach is to regulate each of these contaminants separately.
	Industry / Technical / Site Specific Standard The MECP has commenced discussions with the iron and steel sector on new Industry / Technical / Site Specific Standards for multiple air contaminants that will replace the existing Standards when they expire. The process is led by the MECP and is expected to take a total of 3-4 years to develop the new technical standards. The MECP conducted a site visit and accepted the monitoring program proposals for benzene and metals which may be used to inform if/or where future controls may be required. The Benzene Air Monitoring Program and the Metals Air Monitoring Program which commenced in August, 2018 are both complete.
	The ten week benzene air monitoring program was completed in fall 2018 in the by-product area to look for potential benzene sources not currently controlled. Three sources were identified and control actions were implemented and are now complete.
	The one year ambient air monitoring program commenced in August 2018 and was completed in August 2019 to measure suspended particulate matter and metals (Iron, Chromium VI, Manganese and Nickel). Hexavalent chromium sample results were below precise laboratory detection limits at all locations. Iron and nickel results also did not indicate any concern. Measurements of manganese concentrations were elevated at some locations. The industry standard aims to further investigate sources of manganese such as on-site roadways,

Photo 7: ACLC Public member, David Trowbridge questions the lack of PM 2.5 regulation by the MECP.

**Source**: ACLC Meeting #35 minutes, December 08, 2020, pg 6.



Photo 8: Heavy emissions from ASI on March 09, 2019 emissions event due to a total loss of power.

РОТ	POTENTIAL CONTAMINANTS RELEASED FROM COKE OVEN GAS (COG) EMISSIONS										
	EMISSION TYPE	IMPACTS									
	Carbon Dioxide (CO2)	GHG									
and it was	Carbon Monoxide (CO)	Health/GHG									
and the second second	Methane (CH4)	GHG									
	Nitrogen Oxide (as NO2)	Health/GHG									
2	Particulate Matter (PM 44)	Nuisance									
	Particulate Matter (PM 2.5, PM 10)	Health									
	Trace Metals (Cadmium, Arsenic, Mercury)	Health									
	Sulphur Dioxide (SO2)	Health/GHG									
	Volatile Organic Compounds (VOCs) (Benzene)	Health									
	Polyaromatic Hydrocarbons (PAHs) (Benzo-a-pyrene, BaP)	Health									
and the second s	Tars/Light Oils (as Vapours)	Health									

Photo 9: Potential contaminants released from coke oven gas (COG) and their impacts.



Photo 10: Heavy emissions and flaring from ASI on October 18, 2019 due to pipe burst (Soo Today)

PC	POTENTIAL CONTAMINANTS RELEASED FROM FLARING RAW COKE GAS									
The second se	EMISSION TYPE	IMPACTS								
and the	Carbon Dioxide (CO2)	GHG								
- A BAR AND	Carbon Monoxide (CO)	Health/GHG								
Taria and	Methane (CH4)	GHG								
1 1 9 0	Nitrogen Oxide (as NO2)	Health/GHG								
	Particulate Matter (PM 44)	Nuisance								
	Particulate Matter (PM 10)	Health								
	Particulate Matter (PM 2.5)	Health								
	Sulphur Dioxide (SO2)	Health/GHG								
	Volatile Organic Compounds (VOCs) (Benzene)	Health								
	*VOCs include many com	pounds including benzene								

Photo 11: Potential contaminants released from the flaring of raw coke oven gas and their impacts.Note: Flaring will generate higher levels of PM 2.5 due to combustion processes and gases released



**Photo 12**: Flaring and release of raw coking gas from 8 Battery standpipes and pushing operations releasing raw coke gas (far right)

POTE	POTENTIAL CONTAMINANTS RELEASED FROM RAW COKE OVEN GAS										
10 States	EMISSION TYPE	IMPACTS									
	Carbon Dioxide (CO2)	GHG									
	Carbon Monoxide (CO)	Health/GHG									
1. C.	Methane (CH4)	GHG									
	Nitrogen Oxide (as NO2)	Health/GHG									
n	Hydrogen (H2)	Health/Safety									
and the second se	Particulate Matter (PM 10)	Health									
TOPA	Particulate Matter (PM 2.5)	Health									
I A BAT	Sulphur Dioxide (SO2)	Health/GHG									
A Banding P	Volatile Organic Compounds (VOCs) (Benzene)	Health									
	Polyaromatic Hydrocarbons (PAHs) (Benzo-a-pyrene, BaP)	Health									
	*VOCs include many com	pounds including benzene									

Photo 13: Potential contaminants that could be released and their impacts from raw coking gas

## Power outage cited as cause of weekend Steel Plant incident

Coke battery flaring led to billowing black smoke

Mar 11, 2019 11:28 AM By: SooToday Staff



Smoke seen billowing from Algoma Steel March 9, 2019. Photo submitted

SooToday has received word as to the cause of black smoke billowing from Algoma Steel Saturday.

"I can confirm at 9:40 a.m. Saturday, March 9 we had a temporary total loss of power to the steelworks which resulted in a loss of steam to the operation as well. This necessitated flaring on the coke batteries," wrote Brenda Stenta, Algoma Steel communications manager, in an email to SooToday Monday morning.

"Power was fully restored by 10:45 a.m. and the steam supply followed several hours thereafter. No injuries were sustained. The appropriate authorities were notified. An investigation is underway to determine the root cause and corrective measures," Stenta wrote

**Source**: <u>https://www.sootoday.com/local-news/power-ouatge-cited-as-cause-of-weekend-steel-plant-incident-1315510</u>

## 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: Carol Martin



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 <u>hazecam</u> located at Lake Superior State University in Sault, Michigan.

Local environmentalist David Trowbridge, who co-authored an air-quality study on the West End last <u>October</u>, 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?

Nooooooo.

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 of corporate communications, Brenda Stenta.

"The PM10 figure on the site is a 24-hour rolling average which is the monitoring standard defined by the ministry," Stenta told us 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."

Stenta assures she'll get back to us when she has more information.

Trowbridge 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.

Trowbridge 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

WALLACE	TERRA	CE (71090)		
DM 10 D	NA /1 6	n) [		
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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	MA	RCH 26, 2019
3/26/2019	08:00	127		
3/26/2019	09:00	130		
3/26/2019	10:00	178		
3/26/2019	11:00	21		MIN: 0
2/26/2019	12:00	22		MAX. 178
3/20/2019	12.00	23		
3/26/2019	13.00	31		AVG: 49
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	M	ARCH 27, 2019
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3/27/2019	10:00	85		MIN: 18
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3/27/2019	12:00	59		IVIAA. 104
3/27/2019	13:00	129		AVG: 65
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		
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			* Average	daily limit is 50 uɑ/m3
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**Photo 14:** 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 15: PM 10 data overlaid on Air Quality Health Index (AQHI) data MECP monitor (71078)



#### Photo 16: PM 10 data overlaid on PM 2.5 readings from MECP Sault College monitor (Modified)

## **Source**: <u>http://www.airqualityontario.com/history/pollutant.php?stationid=71078</u>

**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<sub>2</sub> and ozone which are not measured at the Wallace Terrace station (71090) or at any location of ASI AAQM network.



Photo 17: Distance of old MECP PM 2.5 monitor (71068) compared to current location from 9 battery



Photo 18: 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 19: Distance of MECP and HAMN PM 2.5 monitors to AMD and Stelco's closest COB stack



Photo 20: 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 Industrial zone is approximated and is outlined in yellow (Modified images)

Air Quality Data	Air	Qua	lity	Data
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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:

Parameter	Sensor Location		Units	Value
TRS	Wallace Terrace Station	Hour	ly parts per billion	0
PM10 <sup>(1)</sup>	Wallace Terrace Station	24 ho	ur micrograms per cubic metre	5
TRS	Patrick Street Station	Hour	ly parts per billion	0
~Wind Direction Vector <sup>(2)</sup>	Wallace Terrace Station	Η	ourly degrees	7
Wind Speed Vector <sup>(2)</sup>	Wallace Terrace Station		Hourly km/hr	8
Air Temperature	Wallace Terrace Station	Hourl	y Celsius degrees	-73
Page la	ist updated at <b>C</b>	08:00 A	M on April 01 2021	
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From South			180	
r roin o'dan		I	270	

sampled each hour.



**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: <a href="http://algoma.drdas.cloud/">http://algoma.drdas.cloud/</a>

	ork																					
<ul> <li>View Pollutant Concentr.</li> </ul>	ation				Show Latest Data		Collection	Date	Apr-01-2021	~						Collectio	n Time	8.00 - 9.0	0 AM			~
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					6 STN29168	2021-03-31 10:00 PM		0.2						10	40							
Selected Monitor: PM10					7 STN29170	2021-03-31 10:00 PM									34							
thr			1.br	24 br	8 STN29171	2021-03-31 10:00 PM											12.6	337	5.9	50		
Station Valu	• T	Units	AAQC	AAQC	9 STN29172	2021-03-31 10:00 PM											10.2	334				
1 STN29180	221	hðjur,			10 STN29180	2021-03-31 10:00 PM								9	29		6.3	337				
2 STN29153	45	hð <sub>im</sub> ,			11 STN29565	2021-03-31 10:00 PM									46		9.5	359				0
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Photo 22: Hamilton Air Network (HAMN) showing more detailed interactive data available to the public.



Photo 23: The air quality data is graphically represented and the readings for each monitor is available

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

**Source**: <u>http://newreporting.hamnair.ca/</u>

# Why is Algoma Steel lighting the west end with flared coke oven gas?

The problem should be fixed by early next week, the company says

about 14 hours ago By: David Helwig



SooToday reader Janice Anderson snapped this photo of huge flames over Algoma Steel early in the morning of Friday, Oct. 18, 2019. Photo used by permission.

A tiny, ruptured steam line at Algoma Steel is responsible for the spectacular gas flares that have perioidically lit up the Sault's west end over the past week.

Brenda Stenta, the steelmaker's manager of communications and branding, says the flaring should stop early next week.

"On Friday, Oct. 18, 2019, we had a one-inch steam line rupture in the by-products plant which resulted in a loss of power to some related processes," Stenta tells SooToday.

"As per protocol, the cokemaking battery flares were lit – two per battery."

"We have three batteries. The flares are a necessary safety mechanism for the safe combustion of surplus fuel when the process is unable to recycle the fuel in normal course through the boilers and the cogeneration plant. Once power was restored the battery flares were extinguished," she said.

"The coke oven gas stack is flared periodically when coke oven gas exceeds operating demand as is the case currently while the booster that distributes coke oven gas to the boilers gets repaired."

Stenta added: "When the booster comes back online early next week, the flare will not be required."

The Ontario government's <u>hourly air quality measurements</u> for Sault Ste. Marie show spikes in fine particulate matter (PM2.5) corresponding to major flares reported by our readers on Friday, Oct. 18 and Sunday, Oct. 20, but Stenta insists particulate levels aren't related to the coke oven flares.

"While particulate matter emissions were somewhat elevated on Friday during the outage (particulate matter - PM10 24-hour rate at our Wallace Terrace air monitoring station measured 12 micrograms per cubic metre that day, and peaked at 44), they have since returned to normal levels."

"Today the total PM10 24 hour rate is measuring at 0 micrograms per cubic metre. The Ministry of Environment, Conservation, and Parks 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," Stenta said.

**Source**: <u>https://www.sootoday.com/local-news/why-is-algoma-steel-lighting-the-west-end-with-flared-coke-oven-gas-1763598#:~:text=The%20flares%20are%20a%20necessary,boilers%20and%20the%20cogeneration%20plant</u>



**Photo 24:** Sault College MECP PM 2.5 ambient air monitoring data (AQHI) missing "spikes" noted in SooToday article regarding flared coke gas from an emissions event on October 18, 2019.

# Algoma Public Health updates local cancer statistics

New counts are based on a much larger data set, so health officials are downplaying comparisons to cancer statistics released as recently as 2018

## Jan 29, 2020 10:25 PM By: David Helwig



*Dr. Jennifer Loo is associate medical officer of health and director of health protection at Algoma Public Health (David Helwig/SooToday)* 

New, more up-to-date and comprehensive statistics have been released on incidence of cancer in Algoma.

The new numbers were unveiled earlier this month at Sault College by Dr. Jennifer Loo, associate medical officer of health at Algoma Public Health (APH).

For some cancers, most notably prostate and breast, the updated counts differ sharply from incidence rates previously cited by APH.

But the new metrics are based on a much larger data set and health officials are downplaying comparisons to other local cancer statistics released by APH as recently as 16 months ago.

Here are the latest Algoma cancer incidence stats, as made public by Dr. Loo at the Jan. 15 Science Café, a monthly community forum organized by <u>Dryer Fire</u> to discuss scientific issues in an informal and accessible environment:

#### Incidence of cancer in Algoma

• 567.3 new cases of cancer per 100,000 people per year

#### Most common types of cancer in Algoma (highest incidence)

- #1 lung cancer, with 90.8 new cases per 100,000 people per year
- #2 prostate cancer, with 72.0 new cases per 100,000 people per year
- #3 colon cancer, with 71.2 new cases per 100,00 people per year
- #4 breast cancer, with 67.7 new cases per 100,000 people per year
- #5 oral cancer, with 16.2 new cases per 100,000 people per year
- #6 malignant melanoma skin cancer, with 15.3 new cases per 100,000 people per year

Our total number of 567.3 new cancer cases per 100,000 population per year is higher than the comparable Ontario-wide number af 519.5, but not nearly as high as the 752.8 cases reported in the <u>Algoma Community</u> <u>Health Profile</u>, released in September, 2018.

Comparing the new numbers to APH's 2018 rankings, it would appear lung cancer has jumped from the #3 spot in 2018 (with 93.6 new cases per 100,000 people) to become Algoma's most common cancer type.

Prostate cancer, #1 in the 2018 statistics with a worrisome 212.8 cases, seems to have dropped to #2, and breast cancer (female) has apparently dropped to #4 from 193.1 cases per 100,000 16 months ago. Further muddying the local statistical waters is Dr. Kim Barker's <u>Algoma Cancer Report</u>, published in 2015 and covering the decade from 2000 to 2009.

That report ranked Algoma's top three cancers as:

- #1 prostate cancer, with 118.0 cases per 100,000 people per year
- #2 breast cancer, with 100.2 cases per 100,000 people per year
- #3 lung cancer, with 64.7 cases per 100,000 people per year

#### But not so fast.

Jordan Robson, APH's epidemiologist and vice-president of the Association of Public Health Epidemiologists in Ontario, says the figures released this year are derived from a decidedly different data set than the 2018 numbers.

"This [new] data represents an updated and more comprehensive picture of the burden of cancer across Algoma that is informed by 30 years of data, compared to the single-year estimate that was available at the time and published in our Community Health Profile in 2018," Robson tells SooToday.

The statistics unveiled by Dr. Loo this month draw on local cancer cases from 1986 to 2016, while the 2018 *Community Health Profile* was based on just one year of data, from 2013.

"Between 1986 and 2016, the incidence for all cancers was 567.3 cases per 100,000 population in Algoma," Robson says.

"Algoma's rate over this period is statistically higher than the Ontario rate of 519.5 cases per 100,000. Between 1986 and 2016, there were over 22,000 cases of cancer diagnosed in the Algoma population."

"Over the period of 1986 to 2016, Algoma residents were more likely to be diagnosed with lung, colorectal, and oral cancer than an Ontario resident. Algoma residents experienced similar amounts of breast, cervical and prostate cancer compared to Ontario while experiencing statistically lower amounts of malignant melanoma."

"The single-year cancer incidence in Algoma has been stable between 1986 and 2016. Individual years for single cancer types are not presented due to the small number of cases and general overlapping of confidence intervals across the whole time period which hinders meaningful insight," Robson told us.

"It's hard for us in Algoma to be able to get really specific data for just our district or just the city of the Sault, because our population is small and it takes a lot of years of cumulative information for us to be able to draw conclusions from data," Dr. Loo told this month's Science Café.

Asked about drawing Sault Ste. Marie's cancer statistics from the Algoma numbers, Dr. Loo responded: "The problem is Sault Ste. Marie's population is currently around 70,000. In order to report a stat like that, it has to be pretty stable as a number. The unit that we report them in, is so many cases per 100,000 people. For common cancers, we might be able to give you a number for Sault Ste. Marie, but you'd have to do it over a number of years."

"Your numbers are small that, even for common cancers, your estimates are going to have a huge range of variability."

"When it comes to cancer, we're not all that different from the rest of Ontario. When we look at Ontario statistics and we look at Algoma statistics, there's very little reason for us to think that Sault Ste. Marie is going to vary dramatically from those numbers," Dr. Loo said.



Source: https://www.sootoday.com/local-news/algoma-public-health-updates-local-cancer-statistics-2026344

Photo 25: Map showing the area that is under the responsibility of Algoma Public Health (APH).

Source: The image is only available from a google image search since the link is no longer active

**Note**: The statistical data regarding the incidences of health-related issues in the Algoma District can be biased towards lower values by the smaller areas (ex. Blind River) where there is not a high level of exposure to contaminants from industrial emissions compared to the city of Sault Ste. Marie that has heavy industry such as Algoma Steel Inc. and Tenaris Algoma Tubes. There is no specific data for only Sault Ste. Marie.



Photo 26: 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 Bayyiew 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 Bayyiew 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 27: 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.



Photo 28: Algoma Steel Inc. By-products Plant located near the Bayview neighbourhood.



Photo 29: Flare stack for Algoma Steel Inc. By-products Plant to burn-off excess gases.

Exposure to is associated variability: a Robin H. Shutt <sup>1*</sup> , Lisa Marie	air pollution i d with reduced randomised o <sup>Kauri<sup>1</sup>, Scott Weichenthal<sup>2</sup>, Prer</sup>	near a steel plant d heart rate crossover study mkumari Kumarathasan <sup>3</sup> , Renaud Vincent <sup>4</sup> ,
Errol M. Thomson <sup>4</sup> , Ling Liu	<sup>1</sup> , Mamun Mahmud <sup>1</sup> , Sabit Cakr	nak <sup>1</sup> and Robert Dales <sup>1</sup>
Background: Epidemiologi mortality also increases. Ti system function. We wish of subtle changes in hear Methods: Sixty healthy ac locations: (1) adjacent to College campus, several k five consecutive days at ti collected daily. HRV analys rest period, near the end domains were measured. was completed using mix Results: Compared to the (95%CI 3.6,19.2) for the sta normal intervals differing of carbon monoxide, sulp statistically significantly, eli individual air pollutants we patterns of effect showed associated with at least of Conclusions: The significantly	cal studies have shown that as am he mechanisms of this effect m ed to examine the effects of in t rate and rhythm representing dults were randomized to spend a steel plant in the Bayview ne ilometers from the plant. Follow he other site. Ambient AP level sis was undertaken on a segme of the 8-h on-site day. Standar Ambient AP was measured with ed-effects models. college site, HRV was statistica andard deviation of normal to in by more than 50 ms, and 15% hur dioxide, nitrogen dioxide, a evated at Bayview when compa- rere significantly associated with a high degree of consistency, ne measure of HRV.	bient air pollution (AP) increases the risk of cardiovascular iay be linked to alterations in autonomic nervous dustrial AP on heart rate variability (HRV), a measure autonomic input to the heart. d five consecutive 8-h days outdoors in one of two ighbourhood in Sault Ste Marie Ontario or (2) at a ving a 9–16 day washout period, participants spent s and ambulatory electrocardiogram recordings were nt of the ambulatory ECG recording during a 15 min d HRV parameters from both time and frequency h fixed site monitors at both sites. Statistical analysis ally significantly reduced at the Bayview site by 13% normal, 8% (95%CI 0.1, 4.9) for the percent normal to (95%CI 74.9, 571.2) for low frequency power. Levels and the and ultrafine particulates were slightly, but ared to College. Interquartile range changes in a reductions in HRV measured on the same day. The with nearly all pollutants significantly inversely
steel plant may impact au Keywords: Air pollution, S	steel production, Heart rate vari	ability, Industrial air pollution, Environment,
* Correspondence: robin.shutt@hc-sc.g Population Studies Division, Environm Bureaum Health Canada, 50 Colombin Canada	jc.ca iental Health Science Research e Driveway, Ottawa, ON K1A 0 K9,	

Photo 30: Study showing the impact on cardiovascular health in areas closer to ASI.

Source: https://ehjournal.biomedcentral.com/articles/10.1186/s12940-016-0206-0



**Photo 31:** P6C area code has higher rates of acute myeloid leukemia than local and national rates (\*Slide 25)



Photo 32: Boundary of the P6C area code (\*Slide 26 - Modified) (Modified Google Image)

\* Ferrochrome in Sault Ste. Marie, Dr. Robert Suppes (Contributors: Dr. Geoff Skelton, Dr. Pedro Antunes), 2019.



**Photo 33**: Distance of the old MECP PM 2.5 monitoring site at Patrick St. (71068) compared to current location at Sault College relative to the P6C Area Code.



**Photo 34**: 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)

Amended Certificate of Approval (Air) No. 3614-82DLFY	
13. The Company shall make the following available for inspection by any interested member of the public:	
(1) The current Executive Summary complete with the Emission Summary Table, contained in the current Emission Summary and Dispersion Modelling (ESDM) Report for the Facility. The Emission Summary Table shall include the following:	
(a) a list of all the contaminants discharged from the Facility, in accordance with section 26(1)4 of O. Reg. 419/05; and	
(b) for each contaminant in the list,	
<ul> <li>(i) the Chemical Abstracts Service Registry Number for the contaminant,</li> <li>(ii) the approved dispersion model that was used in respect of the contaminant to calculate off-property Point of Impingement concentrations,</li> <li>(iii) the averaging period(s) for which the approved dispersion model was used in respect of the contaminant and, for each averaging period, the sum of the emission rates for the contaminant for all sources in the Facility,</li> <li>(iv) the Schedule 3 standard(s) listed in O. Reg. 419/05, if there is a standard for that contaminant.</li> </ul>	٥r
<ul> <li>(v) the concentration predicted by the approved dispersion model for the Point of Impingement with the highest concentration,</li> <li>(vi) a comparison of the concentration referred to in (v) above and the standard referred to in (iv above, expressed as a percentage of the standard if a standard exists for the contaminant,</li> <li>(vii) the location of the Point of Impingement referred to in (v) above, if there is a standard for the contaminant and the concentration referred to in (v) above exceeds the standard, and</li> <li>(viii) an indication of the likelihood, nature and location of any adverse effect if there is not a standard for the contaminant.</li> </ul>	) ne
The Company shall post the current Executive Summary complete with the Emission Summary Table in the Company's corporate website, and shall provide a hard copy upon request, for inspection by any interested member of the public.	
(2) The results of ambient air monitoring on those non-continuous monitored parameters obtained at the ambient air monitoring stations administered by the Company shall be updated within one (1) week or a time period directed by the District Manager after the results are known to the Company. The results of ambient air monitoring on those continuous monitored parameters obtained at the stations shall be updated hourly. In either case, the time averaging period of each contaminant reported shall correspond to the time averaging period of that contaminant contained in Schedule 3 of O. Reg 419/05. The Company shall post the latest monitoring results in the Company's corporate website, and shall provide a har copy upon request, for inspection by any interested member of the public.	ţ. d
14. The Company shall, on or before June 1, 2010, include the following information as part of its existing environmental website:	
<ol> <li>(1) contact information that members of the public can request for environmental monitoring data;</li> <li>(2) expansion on history of public concerns from the present one (1) month to six (6) months;</li> <li>(3) expansion on history of environmental incidences from the present one (1) month to three (3) months; and</li> <li>(4) results of monitoring of benzene and polyaromatic hydrocarbons.</li> </ol>	
15.1 The Company shall maintain the operation of the Community Liaison Committee (CLC). The objectives of the CLC shall include:	
(1) Keeping the community informed about the operations of the Facility in relation to the requirements of this Certificate	
(2) Keeping the Company informed of any community concerns about the operations of the Facility.	
(3) To serve as a forum for the dissemination, review and exchange of information related to the Facility.	

**Photo 35**: Ontario Amended Certificate of Approval (Air) No. 3614-82DLFY showing requirement to report the latest benzene results from the ambient air quality network (AAQM) stations.

	2018 Four Algoma An	th Quarter Execu October to Decen Ibient Air Quality Sault Ste. Marie	tive Summary Tal nber 2018 Monitoring Progr , Ontario	ole am			2018 (Q4)				
			Patrick Street A	mbient Air Quali	ty Monitoring Statio	n (71068)					
Parameter	Units	Maximum Value	Minimum Value	Arithmetic Mean	Standard	No. of Samples above Standard	Guideline, URT, AAQO Value				
Continuous Parameters											
Total Reduced Sulphur (TRS) - 24hr	ppb	1.7	0.0	0.1	5 ppb (24-hr) <sup>(8)</sup>	0	5 ppb (24 hr)				
Total Reduced Sulphur (TRS) - 10mm	ppb	12.1	0.0	0.1	10ppb (10-min) (8)	4	10 ppb (10 min)				
Non-Continuous Parameters											
Particulate Matter less than 10 microns (PM <sub>10</sub> )	ug/m <sup>3</sup>	31.00	4.00	15.40	N/A	N/A	50 ug/m <sup>3</sup> (24 hr)				
Total Suspended Particulate (TSP) <sup>(7)</sup>	ug/m <sup>3</sup>	41.00	12.00	24.00	N/A	N/A	N/A				
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	ug/m <sup>3</sup>		VARIO	DUS PARAMETE	TERS, NO EXCURSIONS TO REPORT						
Total Suspended Particulate (Ferric oxide)	ug/m <sup>3</sup>	1.77	0.02	0.46	25 ug/m <sup>3</sup> (24-hr)	0	N/A				
Volatile Organic Compounds (VOCs)	ug/m <sup>3</sup>	1	ARIOUS PARAME	TERS, NO EXC	URSIONS TO REPO	RT UNLESS LIST	ED BELOW				
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene) <sup>(10)</sup>	ng/m <sup>3</sup>	2.4000	0.0060	0.4520	N/A	N/A	0.05 ng/m <sup>3</sup> (24 hr)				
				Ambient Air Que	lity Monitoring Stati	on (71090)					
Parameter	Units	Maximum Value	Minimum Value	Arithmetic Mean	Standard	No. of Samples above Standard	Guideline, URT, AAQC Value				
Continuous Parameters											
Total Reduced Sulphur (TRS) - 24hr	ppb	3.4	0.0	0.6	5 ppb (24 hr) (8)	0	5 ppb (24 hr)				
Total Reduced Sulphur (TRS) - 10min	ppb	9.2	0.0	0.6	10 ppb (10 min) (8)	0	10 ppb (10 min)				
Non-Continuous Parameters											
Particulate Matter less than 10 microns (PM <sub>10</sub> )	ug/m <sup>3</sup>	45	0	7	N/A	0	50 ug/m <sup>3</sup> (24 hr)				
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	ug/m <sup>3</sup>		VARIO	US PARAMETE	RS, NO EXCURSION	IS TO REPORT					
Total Suspended Particulate (Ferric oxide)	ug/m <sup>3</sup>	2.36	0.01	0.71	25 ug/m <sup>3</sup> (24 hr)	0	N/A				
Volatile Organic Compounds (VOCs)	ug/m <sup>3</sup>	1	ARIOUS PARAME	TERS, NO EXC	URSIONS TO REPOR	RT UNLESS LIST	ED BELOW				
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene) <sup>(10)</sup>	ng/m <sup>3</sup>	2.5000	0.0070	0.4659	N/A	N/A	0.05 ng/m <sup>3</sup> (24 hr)				

**Photo 36**: GHD Executive Summary (2018) Q4 showing only benzo-a-pyrene data for both of ASI AAQM stations.

	2019 Sec Algoma A	ond Quarter Ex April to Ju Ambient Air Qual Sault Ste. Ma	ecutive Summary 1 ine 2019 ity Monitoring Pro rie, Ontario	Table gram			2019 (Q2)	
			Patrick Street	t Ambient Air Qu	ality Monitoring Sta	tion (71068)		
Parameter	Units	Maximum Value	Minimum Value	Arithmetic Mean	Standard	No. of Samples above Standard	Guideline, URT AAQO Value	
Continuous Parameters								
Total Reduced Sulphur (TRS) - 24hr	ppb	3.1	0.0	0.6	5 ppb (24-hr) <sup>(8)</sup>	0	5 ppb (24 hr)	
Total Reduced Sulphur (TRS) - 10mm	ppb	15.9	0.0	0.6	10ppb (10-min) (8)	23	10 ppb (10 min)	
Non-Continuous Parameters								
Particulate Matter less than 10 microns (PM <sub>10</sub> )	ug/m <sup>3</sup>	70.00	10.00	31.33	N/A	N/A	50 (24 hr)	
Total Suspended Particulate (TSP) <sup>(7)</sup>	ug/m <sup>3</sup>	151.00	24.00	51.57	N/A	N/A	N/A	
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	ug/m <sup>3</sup>		VARIOUS PARAM	ETERS, NO EXC	URSIONS TO REPO	RT UNLESS LISTE	D BELOW	
Total Suspended Particulate (Manganese)	ug/m <sup>3</sup>	0.5610	<mdl< td=""><td>0.1001</td><td>0.4</td><td>1</td><td>0.4</td></mdl<>	0.1001	0.4	1	0.4	
Total Suspended Particulate (Ferric oxide)	ug/m <sup>3</sup>	8.28	0.25	1.77	25 (24-hr)	0	N/A	
Volatile Organic Compounds (VOCs)	ug/m <sup>3</sup>		VARIOUS PARAME	ETERS, NO EXC	URSIONS TO REPO	RT UNLESS LISTE	D BELOW	
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene) <sup>(10)</sup>	ng/m <sup>3</sup>	0.7000	0.0050	0.2176	N/A	N/A	0.05 ng/m <sup>3</sup> (24 hr)	
			Wallace Terrac	e Ambient Air Q	uality Monitoring St	ation (71090)		
Parameter	Units	Maximum Value	Minimum Value	Arithmetic Mean	Standard	No. of Samples above Standard	Guideline, URT AAQO Value	
Continuous Parameters								
Total Reduced Sulphur (TRS) - 24hr	ppb	5.1	0.0	1.4	5 ppb (24 hr) <sup>(8)</sup>	1	5 ppb (24 hr)	
Total Reduced Sulphur (TRS) - 10min	ppb	20	0.0	1.4	10 ppb (10 min) (8)	18	10 ppb (10 min)	
Particulate Matter less than 10 microns (PM <sub>10</sub> )	ug/m <sup>3</sup>	55	0	14	N/A	N/A	50 (24 hr)	
Non-Continuous Parameters								
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	ug/m <sup>3</sup>		VARIO	OUS PARAMETE	RS, NO EXCURSION	IS TO REPORT		
Total Suspended Particulate (Ferric oxide)	ug/m <sup>3</sup>	5.65	0.38	1.56	25 ug/m <sup>3</sup> (24 hr)	0	N/A	
Volatile Organic Compounds (VOCs)	ug/m <sup>3</sup>		VARIOUS PARAME	ETERS, NO EXC	URSIONS TO REPO	RT UNLESS LISTE	D BELOW	
VOCs (Benzene)	ug/m <sup>3</sup>	3.000	0.0800	0.6100	2.3 (ug/m <sup>3</sup> )	1	N/A	
Data and a Associate Underseathers (Danma(a)), and (10)	n m/m 3	2 3000	0.0030	0.6034	N/A	N/A	$0.05 \text{ pg/m}^3(24 \text{ br})$	

Photo 37: GHD Executive Summary (2019) Q2 showing no benzene data for Patrick Station (71068).

	2020 Fi Algoma A	rst Quarter Exec January to N Ambient Air Qua Sault Ste. Ma	utive Summary T Iarch 2020 Iity Monitoring Pi rie, Ontario	'able rogram		2	2020 (Q1)	
	Patrick Street Ambient Air Quality Monitoring Station (71068)							
Parameter	Units	Maximum	Minimum	Arithmetic Mean	Standard <sup>(1)</sup>	Number of Excursions <sup>(2)</sup>	Guideline, URT AAQC Criteria <sup>(1,3,4)</sup>	
Continuous Parameters								
Total Reduced Sulphur (TRS) - 24 hour	ppb	2.5	0.0	0.5	5 ppb (24-hour) (5)	0	5 ppb (24-hour)	
Total Reduced Sulphur (TRS) - 10 minute	ppb	16.5	0.0	0.5	10 ppb (10-minute) (5)	8	10 ppb (10-minute)	
Non-Continuous Parameters								
Particulate Matter less than 10 microns (PM <sub>10</sub> )	μg/m <sup>3</sup>	55.00	6.00	20.73	N/A	N/A	50 (24-hour)	
Total Suspended Particulate (TSP) (6)	µg/m <sup>3</sup>	94.00	8.00	31.93	N/A	N/A	N/A	
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	µg/m <sup>3</sup>		VARIOUS PAR	AMETERS, NO EX	CURSIONS TO REPORT	UNLESS LISTED	BELOW	
Totoal Suspended Pariculate Ferric Oxide (7)	μg/m <sup>3</sup>	3.82	0.08	1.02	25	0	25	
Volatile Organic Compounds (VOCs)	μg/m <sup>3</sup>		V/	ARIOUS PARAMET	ERS, NO EXCURSIONS	TO REPORT		
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m <sup>3</sup>	0.0700	<mdl< td=""><td>0.0239</td><td>N/A</td><td>N/A</td><td>0.05 (24-hour)</td></mdl<>	0.0239	N/A	N/A	0.05 (24-hour)	
Parameter	Units	Maximum	Minimum	Arithmetic Mean	Standard <sup>(1)</sup>	Excursions (2)	Criteria (1,3,4)	
Continuous Parameters					(*)			
Total Reduced Sulphur (TRS) - 24 hour	ppb	4.3	0.0	1.1	5 ppb (24-hour) (5)	0	5 ppb (24-hour)	
Total Reduced Sulphur (TRS) - 10 minute	ppb	19.5	0.0	1.1	10 ppb (10-minute) (5)	34.0	10 ppb (10-minute)	
Particulate Matter less than 10 microns (PM <sub>10</sub> )	μg/m <sup>3</sup>	35	0	9	N/A	N/A	50 (24-hour)	
Non-Continuous Parameters								
Total Suspended Particulate (TSP) (6)	μg/m <sup>3</sup>	71.00	13.00	31.73	N/A	N/A	N/A	
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	μg/m <sup>3</sup>		VARIOUS PAR	AMETERS, NO EXC	CURSIONS TO REPORT	UNLESS LISTED	BELOW	
Total Suspended Particulate Ferric Oxide (7)	μg/m <sup>3</sup>	2.87	0.08	0.90	25	0	25	
Malatila Oscaria Oscara sun da (MOOs)	ug/m <sup>3</sup>		VARIOUS PAR	AMETERS, NO EXC	CURSIONS TO REPORT	UNLESS LISTED	BELOW	
volatile Organic Compounds (VOCs)	- Agrini		1					
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m <sup>3</sup>	0.2000	<mdl< td=""><td>0.0464</td><td>N/A</td><td>N/A</td><td>0.05 (24-hour)</td></mdl<>	0.0464	N/A	N/A	0.05 (24-hour)	
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m <sup>3</sup>	0.2000	<mdl Dus</mdl 	0.0464	N/A uality Monitoring Statio	N/A	0.05 (24-hour)	
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene) Parameter	ng/m <sup>3</sup>	0.2000 Maximum	<mdl Dus Minimum</mdl 	0.0464 tfall Ambient Air Q Arithmetic Mean	N/A uality Monitoring Station Standard <sup>(1)</sup>	N/A ns Number of Excursions <sup>(2,8)</sup>	0.05 (24-hour) Guideline, URT AAQC Criteria <sup>(1,3,4)</sup>	
Voiste Urganic Compounds (VOUs) Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene) Parameter Non-Continuous Parameters	ng/m <sup>3</sup>	0.2000 Maximum	<mdl Dus Minimum</mdl 	0.0464 tfall Ambient Air Q Arithmetic Mean	N/A uality Monitoring Station Standard <sup>(1)</sup>	N/A ns Number of Excursions <sup>(2,8)</sup>	0.05 (24-hour) Guideline, URT AAQC Criteria <sup>(1,3,4)</sup>	
Voieue organic Compounds (VOLS) Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene) Parameter Non-Continuous Parameters Bonney Street Dustfall Station (71042)	Units	0.2000 Maximum 3.65	<mdl Dus Minimum 2.14</mdl 	0.0464 tfall Ambient Air Q Arithmetic Mean 2.87	N/A uality Monitoring Station Standard <sup>(1)</sup> 7	N/A ns Number of Excursions <sup>(2,8)</sup> 0	0.05 (24-hour) Guideline, URT AAQC Criteria (1,3,4) N/A	
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene) Parameter Non-Continuous Parameters Bonney Street Dustfall Station (71042) Adelaide Street Dustfall Station (71045)	ng/m <sup>3</sup> Units g/m <sup>2</sup> /30day g/m <sup>2</sup> /30day	0.2000 Maximum 3.65 0.97	<mdl Dus Minimum 2.14 0.64</mdl 	0.0464 tfall Ambient Air Q Arithmetic Mean 2.87 0.76	N/A uality Monitoring Station Standard <sup>(1)</sup> 7 7	N/A ns Number of Excursions <sup>(2,8)</sup> 0 0	0.05 (24-hour) Guideline, URT AAQC Criteria <sup>(1,3,4)</sup> N/A N/A	
Voisite Organic Compounds (VOCs) Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene) Parameter Non-Continuous Parameters Bonney Street Dustfall Station (71042) Adelaide Street Dustfall Station (71045) Spadina Avenue Dustfall Station (71015)	g/m <sup>2</sup> /30day g/m <sup>2</sup> /30day g/m <sup>2</sup> /30day	0.2000 Maximum 3.65 0.97 5.63	<mdl Dus Minimum 2.14 0.64 1.47</mdl 	0.0464 tfall Ambient Air Q Arithmetic Mean 2.87 0.76 2.95	N/A uality Monitoring Station Standard <sup>(1)</sup> 7 7 7 7	N/A Number of Excursions <sup>(2,8)</sup> 0 0 0	0.05 (24-hour) Guideline, URT AAQC Criteria <sup>(1,3,4)</sup> N/A N/A N/A	

**Photo 38**: GHD Executive Summary (2020) Q1 showing only benzo-a-pyrene data for both of ASI AAQM stations.

	2020 Se Algoma	April to Ju April to Ju Ambient Air Qua Sault Ste. Ma	ine 2020 lity Monitoring P rie, Ontario	Y lable Program			2020 (Q2)			
		Patrick Street Ambient Air Quality Monitoring Station (71068)								
Parameter	Units	Maximum	Minimum	Arithmetic Mean	Standard <sup>(1)</sup>	Number of Excursions <sup>(2)</sup>	Guideline, URT AAQC Criteria <sup>(1,3,4)</sup>			
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 <sub>10</sub> )	μg/m <sup>3</sup>	36.00	5.00	20.53	N/A	N/A	50 (24-hour)			
Total Suspended Particulate (TSP) (6)	μg/m <sup>3</sup>	93.00	12.00	44.07	N/A	N/A	N/A			
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	μg/m <sup>3</sup>	VARIOUS PARAMETERS, NO EXCURSIONS TO REPORT UNLESS LISTED BELOW								
Totoal Suspended Pariculate Ferric Oxide (7)	μg/m <sup>3</sup>	2.80	<mdl< td=""><td>1.09</td><td>25</td><td>0</td><td>25</td></mdl<>	1.09	25	0	25			
Volatile Organic Compounds (VOCs)	μg/m <sup>3</sup>	VARIOUS PARAMETERS, NO EXCURSIONS TO REPORT								
Chloroform	μg/m3	2.1000	<mdl< td=""><td>0.3771</td><td>1</td><td>1</td><td>1</td></mdl<>	0.3771	1	1	1			
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m <sup>3</sup>	0.1000	0.0090	0.0441	N/A	N/A	0.05 (24-hour)			
			Wallace Te	rrace Ambient Air (	Quality Monitoring Statio	on (71090)				
Parameter	Units	Maximum	Minimum	Arithmetic Mean	Standard <sup>(1)</sup>	Number of Excursions <sup>(2)</sup>	Guideline, URT AAQC Criteria <sup>(1,3,4)</sup>			
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 <sub>10</sub> )	μg/m <sup>3</sup>	58	0	15	N/A	1	50 (24-hour)			
Non-Continuous Parameters										
Total Suspended Particulate (TSP) (6)	μg/m <sup>3</sup>	89.00	16.00	46.64	N/A	N/A	N/A			
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	μg/m <sup>3</sup>	VARIOUS PARAMETERS, NO EXCURSIONS TO REPORT UNLESS LISTED BELOW								
Total Suspended Particulate Ferric Oxide (7)	μg/m <sup>3</sup>	3.39	<mdl< td=""><td>1.26</td><td>25</td><td>0</td><td>25</td></mdl<>	1.26	25	0	25			
Volatile Organic Compounds (VOCs)	μg/m <sup>3</sup>		VARIOUS PAR	RAMETERS, NO EXC	CURSIONS TO REPORT	UNLESS LISTED	BELOW			
Chloroform	μg/m <sup>3</sup>	2.0000	<mdl< td=""><td>0.4083</td><td>1</td><td>1</td><td>1</td></mdl<>	0.4083	1	1	1			
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m <sup>3</sup>	1.1000	0.0070	0.3481	N/A	N/A	0.05 (24-hour)			

Photo 39: GHD Executive Summary (2020) Q2 showing no benzene data for both of ASI AAQM stations.

The Community Liaison Committee requirements are the same for all the facilities in the sector but operate under their own Terms of Reference.
3. Recommendation that Algoma should have an appropriate air ambient monitoring network and real-time sampling to validate emission reductions. Response: There is currently a monitoring network in the vicinity of Algoma and the ministry is currently reviewing the request to examine air monitoring in Sault Ste. Marie, but a definitive date for the completion of the review has not yet been set. The ministry is assessing what more can be done through its work to develop a technical standard.
4. Recommendation that the funds for these projects should have been previously committed and a portion of the current government funding should be reallocated to these environmental projects. Response: The provincial funding provided as a repayable loan through the Ministry of Energy, Northern Development and Mines was tied to very specific capital projects with no ability to reallocate them.
5. Concerns that these facilities are causing health impacts in the community. Response: When facilities emit contaminants above a general air standard, it does not necessarily mean that adverse effects will occur, however the risk increases as concentrations increase. In particular, levels of benzene and benzo[a]pyrene from these facilities will continue to be the focus for reduction over time.
While extending the existing site-specific standards will not drive additional reductions in emissions during the extension period, other work continues with the facilities to further reduce emissions of contaminants such as benzene, including what investments are possible to reduce Benzo[a]Pyrene.
The ministry recognizes the efforts made by the integrated iron and steel companies to date to meet their site-specific standards. Some improvements have been achieved, and the ministry will continue to assess what else can be done and to seek further reductions in emissions, with the goal of continuous improvement to reduce health and environmental risk, through its work on a technical standard for the sector.
Anyone with health-related questions related to environmental exposures should contact their local Public Health Unit or the ministry's Technical Assessment and Standards Development Branch.
6. Batchewana First Nation is concerned with environmental and health issues emanating from Algoma Steel. Batchewana First Nation will not endorse this request and will correspond with the ministry to discuss next steps. Response: The ministry continues to work with the public, municipalities, First Nations, environmental groups and industry to drive strategies that better protect air quality. The ministry recognizes that further efforts are needed to reduce risks to the environment and human health and will continue discussions with the First Nation community on the long- term actions to improve air quality.
In the meantime, this extension will allow the company to continue their work to reduce emissions and ensure there is a clear compliance approach in place to address issues.

**Photo 40**: ERO requesting health concerns of emissions to be referred to MECP Technical Support and the local Public Health Unit
Tania Caputo <tcaputo@algomapublichealth.com></tcaputo@algomapublichealth.com>
To: Selva Rasaiah <selvarasaiah@hotmail.com></selvarasaiah@hotmail.com>
Hello Selva.
Thank you for your email request. I would like to assure you that a member of the APH team will respond in due course. Due to the urgent demands of the pandemic response, inquiries will be responded to on a priority basis.
Have a good day,
Tania
Algoma
PUBLIC HEALTH
Santé publique Algoma
Executive Assistant to the
Medical Officer of Health and
Secretary to the Board of Health
\$ 5421
From: Selva Rasaiah <selvarasaiah@hotmail.com> Sent: Monday, January 25, 2021 10:41 AM</selvarasaiah@hotmail.com>
To: Tania Caputo <tcaputo@algomapublichealth.com></tcaputo@algomapublichealth.com>
Subject: APH Cancer Report
Hello Tania,
would appreciate more specific details regarding the Algoma Public Health study that discussed updated cancer statistics in the region. I am referring to the presentation that Dr. Loo gave regarding this topic at Sault College: <a href="https://www.sootoday.com/local-news/algoma-public-health-updates-local-cancer-statistics-2026344">https://www.sootoday.com/local-news/algoma-public-health-updates-local-cancer-statistics-2026344</a>
Some specific questions I have include:
1.) How many people were in the study (actual number)?
2.) The breakdown of where each type (and how many cases) of cancer were noted between areas (ex. Sault Ste Marie, Blind River,
Wawa. etc.)? 3.) The questions asked on the "questionnaire" used in the study that nearly filled out (including how many wara received by APH\2
4.) How the report considered potential illness from industrial emissions (ex. Sault Ste. Marie residents would have higher exposure to
these emissions due to more industry)?
Also, has APH done any studies since 2005 (or prior) that discuss the potential health impacts of industrial emissions in Sault Ste. Marie? Does APH review particulate data (PM10 and Benzene) from the MECP ambient air quality monitoring station at Wallace Terrance station
Please feel free to contact me anytime for clarification.
Thank you,
Selva Rasaiah
(705) 942-9179
(705) 942-9179
(705) 942-9179

**RE: APH Cancer Report** 

Photo 41: Initial e-mail from APH regarding the request for information on APH cancer statistics study

#### APH Cancer Report Inquiry

Liliana Bressan <LBressan@algomapublichealth.com>

Wed 17/02/2021 11:02 AM

To: selvarasaiah@hotmail.com <selvarasaiah@hotmail.com>

Cc: Liliana Bressan <LBressan@algomapublichealth.com>; Kristy Harper <kharper@algomapublichealth.com>

1 attachments (2 MB)
 CCC - Prevention System Quality Index.pdf;

eee merendon bystem of

Hello Selva,

Thank you for reaching out to APH, and my apologies for the delay in responding to your inquiry.

APH does not conduct research studies. We used data compiled from larger, external data sets and sources to inform our work. We also haven't run any formal ecological level correlations on air quality and illness metrics to date. We rely on relevant and reliable sources of literature/research for these connections, as well as provincial reports.

Therefore, there are no specific answers to your four questions.

Our epidemiologist does use <u>CCO SEER\* Stat Package</u> which allows for the analysis of provincial and regional cancer data. This is where the statistics used in the article were derived, as it hosts data from 1981-2016. The Algoma Community Health Profile was also used, and as mentioned in the article, only provided a snapshot of chronic disease risks/rates.

#### Resources that may be of interest:

- Cancer Incidence (Public Health Ontario Northwestern Region): <u>https://www.publichealthontario.ca/en/data-and-analysis/chronic-disease/cancer-incidence</u>
- 2. Cancer Care Ontario also publishes reports each year and has online data available here: <a href="https://www.cancercareontario.ca/en/data-research/view-data/cancer-statistics/ontario-cancer-profiles">https://www.cancercareontario.ca/en/data-research/view-data/cancer-statistics/ontario-cancer-profiles</a>
- Cancer Risk Factors in Ontario (Includes a section on industrial chemicals, of which most are occupational-based risks): <u>https://www.cancercareontario.ca/sites/ccocancercare/files/assets/CCORiskFactorsCancer.pdf</u>
- 4. Cancer Care Ontario Prevention System Quality Index (Environment and Injury Sections) See attached.
- 5. Environmental Burden of Cancer in Ontario: <u>https://www.publichealthontario.ca/-/media/documents/e/2016/environmental-burden-cancer-technical.pdf?la=en</u>

As for air quality, our Environmental Health team monitors the air quality index and also relies on the Ministry of Environment, Conservation and Parks (MECP) to provide updates concerning AS Inc. releases.

- 1. Algoma Steel Inc. Air Quality Data daily updates: http://algomaaq.esolutionsgroup.ca/AirQuality.aspx
- 2. Algoma Steel Inc. Environmental Info: https://www.algoma.com/environment/
- 3. MECP Sault Ste. Marie Station (Sault College): http://www.airqualityontario.com/history/station.php?stationid=71078
- 4. MECP SSM Air Quality Health Index Readings: http://www.airqualityontario.com/aqhi/today.php?sites=71078

As I am sure you are familiar, MECP issues the environmental compliance approval (ECA) for Algoma Steel Inc. to monitor air quality and the approval would outline the monitoring requirements and applicable limits. I believe the monitoring itself is contracted to an environmental consultant company who collects data (e.g. VOCs/PM10) from the stations (including Wallace Terr.) and reports accordingly. We only receive updates from MECP when releases are above measures as an alert and therefore <u>do not have access</u> to the individual monitoring station data, etc. This data is also not publically available, as far as I am aware.

Please advise if you have any further questions. Happy to discuss. Take care.

Liliana Bressan, MPH, RN, BSCN Public Health Specialist - Environment & Health, Community Wellness & Healthy Environments Algoma Public Health | 294 Willow Ave. | Sault Ste. Marie, ON P6B 0A9 Tel: 705-255-3393 LBressan@algomapublichealth.com Visit our website at www.algomapublichealth.com

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Hello Tania,

Photo 42: Response from APH stating their role in studying the impact of industrial emissions

4/15/2021

Mail - Selva Rasaiah - Outlook

### **RE: MECP Technical Response - SSM AAQM Network**

Innis, Shannon (MECP) <Shannon.Innis@ontario.ca>

Wed 14/04/2021 12:54 PM

To: Selva Rasaiah <selvarasaiah@hotmail.com>

Cc: Leith, Carroll (MECP) <Carroll.Leith@ontario.ca>; Dorscht, Ron (MECP) <Ron.Dorscht@ontario.ca> Hello Selva.

Thank you for your email. In regards to the response provided by our Technical Support Section to Ron Dorscht regarding the Sault Ste. Marie Air Quality Monitoring, a response was prepared, however it is still in draft. If you are interested in acquiring further information for the Algoma Steel Facility, it is best to contact our Freedom of Information office and submit a request. If you have further questions, please direct them to Ron Dorscht who will engage the Technical Support Section as needed in preparing his response. Thanks,

#### Shannon Innis

Air, Pesticides, and GIS Supervisor (A) | Ministry of the Environment, Conservation and Parks, Northern Region

199 Larch St, Suite 1201, Sudbury, Ontario P3E 5P9 | Phone: 705-280-9349 Toll Free: 1-800-890-8516 | Fax: 705-564-4180 Email: shannon.innis@ontario.ca

From: Selva Rasaiah <selvarasaiah@hotmail.com> Sent: April-14-21 9:28 AM To: Innis, Shannon (MECP) <Shannon.Innis@ontario.ca>

Cc: Dorscht, Ron (MECP) <Ron.Dorscht@ontario.ca>; Cameron, Brian (MECP) <Brian.Cameron@ontario.ca>; Allen, Paula (ENDM) <Paula.Allen@ontario.ca>; Qiu, Guowang (MECP) <Guowang.Qiu@ontario.ca>; Mayor Provenzano <mayor.provenzano@cityssm.on.ca>; jloo@algomapublichealth.com Loo <jloo@algomapublichealth.com>; Malcolm White <m.white@cityssm.on.ca>; Peter McLarty <pjmclarty@shaw.ca>; David Trowbridge <dtrowbridge7@gmail.com>; jillianmarquis94@gmail.com; gpokflan@gmail.com; Paul.Walz@algoma.com; ross.romano@pc.ola.org; TERRY.SHEEHAN@PARL.GC.CA; John OLeary <joleary@ombudsman.on.ca> Subject: Re: MECP Technical Response - SSM AAQM Network

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender. Hello Ms. Innis,

Thank you for reviewing this issue. I was just wondering if you could provide me an update of the Technical Branch's position regarding the SSM Ambient Air Monitoring network? In particular, the reasons provided to MECP Dorscht in January 2019. Mayor Provenzano has confirmed that he would look into the matter. I would also like to discuss this situation with Dr. Loo at Algoma Public Health since emissions around the steel plant and future increases in industrial operations are concerns for many residents. Mr. Trowbridge (ACLC Public member)has been persistent in requests since 2006 to reassess our monitoring network with no substantive response. I would appreciate any information that would be useful to begin a productive dialogue with ASI's ACLC, APH, the city and its agencies.

**Photo 43:** E-mail from MECP Technical Support referring issues related to air quality concerns to the local MECP.

4/16/2021

Mail - Selva Rasaiah - Outlook

#### **GHD Reports - Benzene Data**

Selva Rasaiah <selvarasaiah@hotmail.com>

Thu 15/04/2021 3:17 PM

To: Dorscht, Ron (MECP) <Ron.Dorscht@ontario.ca>

Cc: Innis, Shannon (MECP) <Shannon.Innis@ontario.ca>; brian.cameron@ontario.ca <brian.cameron@ontario.ca>; Paul.Walz@algoma.com <Paul.Walz@algoma.com>

1 attachments (195 KB) ASI\_GHDBenzene\_2020.pdf;

Hello Mr. Dorscht,

I have not received a reply to why there is no benzene data for 2020 GHD Q1,Q2 and Q4 reports for both stations (see attachment). There would be an expectation that there would be some background level or a notation of "<MDL" if it were analyzed. Could you consult with ASI and the MECP Technical Branch as to why there is no benzene data (VOCs) and why chloroform was a parameter in Q2 data? Also, are the windrose diagrams presented in ACLC meetings from Wallace Terrace or the Goulais Ave Met station? I would appreciate a response.

Thanks,

Selva

**Photo 44**: A recent request to the MECP requesting the missing benzene data from GHD Executive Summary reports

	Algoma A	October to Dece mbient Air Qualit Sault Ste. Mari	mber 2020 y Monitoring Pro a, Ontario	gram			
			Patrick Stree	et Ambient Air Quali	ty Monitoring Station (7	(1068)	
Parameter	Units	Maximum	Minimum	Arithmetic Mean	Standard (1)	Number of Excursions (2)	Guideline, URT AAQC Criteria (1,3,4)
Continuous Parameters							
Total Reduced Sulphur (TRS) - 24 hour	ppb	1.6	0.0	0.1	5 ppb (24-hour) (5)	0	5 ppb (24-hour)
Total Reduced Sulphur (TRS) - 10 minute	ppb	16.1	0.0	0.2	10 ppb (10-minute) (5)	2	10 ppb (10-minute)
Non-Continuous Parameters							
Particulate Matter less than 10 microns (PM <sub>10</sub> )	uq/m <sup>3</sup>	27.00	4.00	11.43	N/A	N/A	50 (24-hour)
Total Suspended Particulate (TSP) (6)	µg/m <sup>3</sup>	66.00	10.00	27.40	N/A	N/A	N/A
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	µg/m <sup>3</sup>		VARIOUS PAR	RAMETERS, NO EXC	URSIONS TO REPORT	UNLESS LISTED E	BELOW
Total Suspended Pariculate Ferric Oxide (7)	µg/m <sup>3</sup>	2.90	0.11	0.75	25	0	25
Volatile Organic Compounds (VOCs)	µg/m <sup>3</sup>		V	ARIOUS PARAMET	ERS, NO EXCURSIONS	TO REPORT	
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m <sup>3</sup>	9.3000	0.0009	1.4218	N/A	N/A	0.05 (24-hour)
Decementer	Unite	Maximum	Wallace Terra	ce Ambient Air Qua	lity Monitoring Station	(71090)	Quideline URT AAOO
Parameter	Units	maximum	Minimum	Anthmetic Mean	Standard 19	Excursions (2)	Criteria (1,3,4)
Continuous Parameters			I			Excursions	Citteria
Total Reduced Sulphur (TRS) - 24 hour	ppb	2.3	0.0	0.4	5 ppb (24-hour) (5)	0	5 ppb (24-hour)
Total Reduced Sulphur (TRS) - 10 minute	ppb	14.7	0.0	0.4	10 ppb (10-minute) (5)	4	10 ppb (10-minute)
Particulate Matter less than 10 microns (PM <sub>10</sub> )	µg/m <sup>3</sup>	44	0	9	N/A	0	50 (24-hour)
Non-Continuous Parameters			•				
Total Suspended Particulate (TSP) (6)	µg/m <sup>3</sup>	67.00	15.00	29.53	N/A	N/A	N/A
Total Suspended Particulate Metals (TSP Metals except Ferric Oxide)	µg/m <sup>3</sup>		VARIOUS PAR	RAMETERS, NO EXC	URSIONS TO REPORT	UNLESS LISTED B	BELOW
Total Suspended Particulate Ferric Oxide (7)	µg/m <sup>3</sup>	4.31	0.16	1.17	25	0	25
Volatile Organic Compounds (VOCs)	µg/m <sup>3</sup>		VARIOUS PAR	RAMETERS, NO EXC	URSIONS TO REPORT	UNLESS LISTED B	BELOW
Poly-cyclic Aromatic Hydrocarbons (Benzo(a)pyrene)	ng/m <sup>3</sup>	5.5000	0.0010	0.7228	N/A	N/A	0.05 (24-hour)
			Decette	I Ambient Air Own	the Manifesting Stations		
Parameter	Units	Maximum	Minimum	Arithmetic Mean	Standard (1)	Number of	Guideline, URT 4400
					otanuard	Excursions (2,8)	Criteria (1,3,4)
Non-Continuous Parameters							
Bonney Street Dustfall Station (71042)	g/m <sup>2</sup> /30day	3.20	1.61	2.41	7	0	N/A
Adelaide Street Dustfall Station (71045)	g/m²/30day	1.99	0.35	0.91	7	0	N/A
Spadina Avenue Dustfall Station (71015)	g/m <sup>2</sup> /30day	1.58	0.79	1.19	7	0	N/A
Milding Avenue Dustfell Station (71042)	a/m <sup>2</sup> /30day	0.93	0.20	0.64	7	0	

Photo 45: Most recent air quality report from AAQM stations with no VOCs (Benzene).

	BENZEN	E (VOCs)		BE	NZO-A-PYRE	NE (BaP) (P	AH)
	PATRICK	ST. (71068)			PATRICK	ST. (71068)	
	MAX	MIN	AVG		MAX	MIN	AVG
01	ND	ND	ND	01	0.0700	<mdl< td=""><td>0.023</td></mdl<>	0.023
Q2	ND	ND	ND	Q2	0.0100	0.0090	0.044
Q3	2.9700	0.0800	0.7288	Q3	0.3000	0.0080	0.121
Q4	ND	ND	ND	Q4	9.3000	0.0009	1.4218
V	VALLACE TEF	RRACE (7109	0)	v	VALLACE TEF	RRACE (7109	0)
	MAX	MIN	AVG.		MAX	MIN	AVG.
Q1	ND	ND	ND	Q1	0.2000	<mdl< td=""><td>0.0464</td></mdl<>	0.0464
Q2	ND	ND	ND	Q2	1.1000	0.0070	0.348
Q3	3.7700	0.2600	1.2213	Q3	1.2000	0.0200	0.200
Q4	ND	ND	ND	Q4	5.5000	0.0010	0.722

Photo 46: Chart summarizing the data for benzene and benzo-a-pyrene from GHD quarterly reports

**Note**: Q2 noted the presence of chloroform (CHCl<sub>3</sub>) for VOCs but data was omitted in the table since it is not a chemical species that contains benzene. There is no benzene data for three quarters in 2020.

	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
ronmaking	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
loonnaiding	0,211,022	0,211,022	0,211,022	0,211,022	2,201,011	2,100,200
			BENZENE ()	/OCs)		
	2015	2016	2017	2018	2019	2020
lenzene	5.94	5.76	3.94	4 39	4 67	3.57
mit (ug/m3)	0.5	0.5	0.45	5.5 (2)	550	22 (5)
POI	1197%	1152%	875 75%	70 7/04	84 01%	162 20%
POI	1187%	1152%	8/3./3%	79.74%	84.91%	162.29%
		BE	NZO-a-PYRE	NE (PAHs)		
	2015	2016	2017	2018	2019	2020
enzo-a-pyrene	0.01129	0.01121	0.00312	0.00368	0.00525	0.00477
mit (ug/m2)	0.00001	0.00001	0.00012	0.00308	0.00323	0.004/7
	11200001	112100%	0.00001	22.45%	47 700/	110.25%
		PAR	TICULATE M	ATTER (PM)		
	2015	2016	2017	2018	2019	2020
M 2.5	52.57	52.04	51.36	72.16	37.84	33.89
mit (ua/m3)	25.00	25.00	25.00	25.00	25.00	25.00
POL	210 29%	208 16%	205 42%	288.66%	151.37%	135 57%
	210.2070	200.1070	200.4270	200.0070	101.0770	100.0770
M 10	76.39	74.5	76.79	96.22	64.81	63.97
mit (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%
M 44	151.98	149.92	147.07	148.85	116.41	102.21
mit (ug/m3)	120	120	120	164 (4)	127 (4)	127 (4)
POI	126.65%	124.93%	122.56%	90.76%	91.66%	80.48%
otes:						
) Estimated prod	uction levels					
) Site-Specific St	andard - Appro	oved Increase	in MECP Lim	it from 0.50 ug	g/m3 to 5.5 ug	/m3
) Cito Chooifio Ct	andard Appr	wed increase	in MECP Lim	it from 0 0000	1 ua/m3 to 0 (	)11 µa/m3

Photo 47: Summary of 2015-2020 ASI Emission Summary and Dispersion Modelling (ESDM) reports

**Note**: MECP PM 2.5 and PM 10 limits were exceeded in all years. Exceedances in benzene and benzo-apyrene in 2020 are a result of lower Site-Specific Standards (SSS) and an extension by the MECP for ASI to delay the completion of necessary upgrades to mitigate sources of these emissions.



Photo 48: 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<sup>3</sup>



Photo 49: 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<sup>3</sup>

From: Dorscht, Ron (MECP) Sent: May-22-19 1:47 PM To: Allen, Paula (MECP) <paula.allen@ontario.ca> Cc: Cameron, Brian (MECP) <brian.cameron@ontario.ca>; McDonald, Kathy (MECP) <kathy.mcdonald@ontario.ca>; Greco, Lori (MECP) <lori.greco@ontario.ca> Subject: RE: SSM Air Quality Monitoring</lori.greco@ontario.ca></kathy.mcdonald@ontario.ca></brian.cameron@ontario.ca></paula.allen@ontario.ca>	į
Paula,	
Just following up on this email I sent early in the year.	
Ron	
From: Dorscht, Ron (MECP) Sent: January 21, 2019 3:49 PM To: Allen, Paula (MECP) < <u>Paula.Allen@ontario.ca</u> > Cc: Cameron, Brian (MECP) < <u>Brian.Cameron@ontario.ca</u> >; McDonald, Kathy (MECP) < <u>Kathy.McDonald@ontario.ca</u> >; Greco, Lori (MECP) < <u>Lori.Greco@ontario.ca</u> > Subject: SSM Air Quality Monitoring	i
•	002252
Paula, 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:	
<ol> <li>Is Algoma Steel's monitoring and reporting reliable and accurate?</li> <li>Is the current monitoring program sufficient to determine the company's impact on local air quality? i.e. is more monitoring requiredparameters, locations, etc</li> <li>How the SSM monitoring compares with other Steel Plant locations, i.e. Hamilton</li> <li>Any other recommendations TS staff may have for improving the monitoring of Air Quality ir SSM.</li> </ol>	ı
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,	
Ron Dorscht Ron Dorscht, B.E.S. Supervisor Sault Ste. Marie Area Office Ministry of the Environment, Conservation and Parks (705)942-6322	

**Photo 50**: Letter from MECP Dorscht to MECP Technical Support requesting an assessment of current SSM AAQM network to determine its accuracy and reliability.

# Concerned abour air quality? Tony wants you to read this

### Jun 24, 2008 12:16 PM By: SooToday.com Staff



NEWS RELEASE

TONY MARTIN, MP

### 

SAULT STE. MARIE, ON - (June 24) - Public mailed or online comments are now welcome on Algoma Steel's submission for a new certificate of approval (air) for one emission control baghouse system for the Number 6 blast furnace.

Sault MP Tony Martin is encouraging all those citizens who are concerned about air quality in Sault Ste. Marie to comment on the application to the Ministry of the Environment (MOE).

"I commend Algoma Steel Inc. for hosting the recent open houses in order to inform the residents what measures are going to be implemented to combat air quality issues," Martin said. "Open and honest communication, including alerting local residents when an exceedance occurs, will go a long way to establishing a good neighbour policy."

"The recent report by the Ontario Medical Association, citing up to 46 deaths potentially related to air quality, and 99 hospital admissions, reminds us how important clean air is to our health," Martin said.

Submissions to this application and two other proposals on the ministry's registry, EBR numbers 010-3758 and 010-3759, have been posted for public comment for a 30-day period starting June 12, 2008.

All comments received prior to July 12, 2008, will be considered as part of the decision-making process by MOE.

Comments may be made in writing or submitted on the Environmental Bill of Rights website, quoting reference EBR registry number 010-3761.

All comments will become part of the public record and will be reflected in the decision notice associated with this proposal.

Comments should be directed to:

Application Processor, Client Services Section Ministry of the Environment Operations Division Environmental Assessment and Approvals Branch 2 St. Clair Avenue West, Floor 12A Toronto, ON M4V 1L5

On-line comments can be made by clicking here.

The baghouse is a device designed to capture and control particulate emissions that are discharged into the atmosphere.

\*\*\*\*\*

**Source**: <u>https://www.sootoday.com/local-news/concerned-abour-air-quality-tony-wants-you-to-read-this-117517</u>

Comment on	Algoma Steel <abbr title="incorporated">Inc.</abbr>
EBR registry number	010-3759
Ministry	Ministry of the Environment
Notice type	Instrument
Notice status	Decision
Date proposal loaded to the registry	June 12, 2008
Comment period	Public Consultation on the proposal for this decision was provided for 30 Days, from June 12, 2008 to July 12, 2008.
Comment ID	ERS-Comment ID 114654
Comment	I have lived with my family in three homes, all in the downtown area, and east and downwind of the Plant, for 36 years. I have since developed allergic asthma late in life.
	We sleep with windows open even in the winter, and have been suspicious over all these years of frequent unusual smells and emissions at night and at the weekends.
	Of course, it didn't help that the Ministry took so long to force the Hospital to stop incinerating waste on site. And it is certainly not fair to blame only the Steel plant for emissions, as the paper mill and flakeboard company also surely have added and will continue to add their share.
	As far as we are concerned, Ministry of the Environment officials must stop letting any organisation that pollutes (be it air or water or soil) off the hook with continual excuses over time, as has been the case in the past. All branches of the Ministry must hold all polluters to the highest standards and enforce those standards at all times. And if the penalties and fines are made more substantial, that is fine by us!
	We are not comfortable with the Steel Plant hosting and being responsible for the maintenance of monitoring stations, be it on their property or not. The fox guarding the henhouse comes to mind. And averaging measurements of air quality on the web-site is a problem, we should be able to see what the highest reading's are.
	We all know that asthma and other serious health conditions are worsening in all polluted places, putting greater strain on health services. I resent having to stop exercise and stay indoors on smoggy days, which forces the expensive installation and use of air conditioners, and I worry about the effect on all our grandchildren.
	The flare at Algoma Steel must go, and all baghouses and other emission control devices must be in place a.s.a.p. without any more delays and excuses.
	So, do your job, Ministry, and we will do ours by putting pressure on you!

Photo 51: Public comment in 2008 about health concerns and ASI's responsibility for the AAQM network

# Tony applauds Sault air quality study

May 3, 2010 4:28 PM By: SooToday.com Staff



## NEWS RELEASE

TONY MARTIN, MP

# \* Martin hails new \$900,000 Health Canada air quality study - long-term work pays off!

SAULT STE. MARIE - The \$900,000 major outdoor air quality study announced by Health Canada for Sault Ste. Marie validates years of work by citizens and concerned groups, Sault MP Tony Martin said today.

"I congratulate Health Canada, Algoma University, NORDIK Institute and especially want to pay tribute to the Bayview residents in the West End and the Air Quality Committee who I have worked with for many years now on this important health and environment issue." This study, the largest ever by Algoma University and third of its type in a Canadian urban centre, is expected to advance research significantly on the impact of air quality on human health, especially respiratory and vascular systems.

Since 2004, following discussions with Bayview residents, MP Tony Martin commissioned a study of local air quality, and then held a public forum on air quality.

Martin commissioned an environmental expert to prepare a report based on complaints by Bayview residents about their air quality (the completed report is called *Breathing Easy*).

Martin hosted an environmental forum with Ontario NDP Environment Critic Peter Tabuns at Alexander Henry High School on April 24, 2008; 200 people attended.

Martin encouraged local citizens to send their submissions to the environmental commissioner on Essar's Certificate of Approval; the commissioner said it was the most comments ever received on an application.

In response to this community initiative, Essar announced they were putting in temporary baghouses and expediting permanent baghouses by 2009 to cut air emissions.

Also in response to this work by Martin and local leaders, Essar held their own information and accountability sessions with the public.

Martin successfully pressured Essar Steel Algoma and the provincial government to initiate long-term solutions to reduce air pollution, resulting in investments of \$70 to \$100 million recently announced by Essar.

NORDIK announced the research will be conducted at two sites where the Ministry of the Environment currently has air quality monitoring equipment, one in the Bayview area and one adjacent to Sault College.

Subjects in the current study will be exposed to urban air pollution including motor vehicle and industrial emissions, and will also take into account weather and airborne allergens.

NORDIK Institute is a community-based research institute attached to Algoma University, and has conducted research on a variety of topics including the social economy, culture and the arts, and socio-economic impact analysis.

NORDIK also works closely with indigenous communities to respond to their research needs.

\*\*\*\*\*

Source: https://www.sootoday.com/local-news/tony-applauds-sault-air-quality-study-129870

#### 3/27/2021

Mail - Selva Rasaiah - Outlook

#### Algoma Steel Emissions Concerns

#### Selva Rasaiah <selvarasaiah@hotmail.com>

Sun 11/08/2019 1:37 PM

To: TERRY.SHEEHAN@PARL.GC.CA <TERRY.SHEEHAN@PARL.GC.CA >; ross.romano@pc.ola.org <ross.romano@pc.ola.org>; mayor.provenzano@cityssm.on.ca <mayor.provenzano@cityssm.on.ca>; cspooney@algomapublichealth.com <cspooney@algomapublichealth.com>

#### 6 attachments (11 MB)

March09\_Timline.pdf; Iron Emissions of No. 07 Blast Furnace\_ACLC.pdf; ASI USA Hazes.pdf; ASI AirMonitoringStation\_B 001.jpg; ASI Baghouse 25M 001.jpg; BF7andBaghouse.jpg;

#### Hello everyone,

I am a concerned resident and former third-party (Pinchin Ltd.) emissions auditor of the coke oven batteries at Algoma Steel Inc. in Sault Ste. Marie. I have many concerns about how the audits are conducted and the enforcement compliance issues regarding their emissions. I was not satisfied with the conduct at the facility and brought those concerns to the environmental staff at Algoma and Pinchin Ltd. SSM. I have been independently monitoring and recording Algoma's emissions for over 90 days since their major emissions event on March 09, 2019. I met with Ron Dorscht and Lori Greco on Thursday July 07, 2019 to discuss my concerns. The meeting was insightful, but I disagree with the local ministry and I believe that Algoma Steel Inc. should be prosecuted for the events on March 09 (Ministry Report 1433-BA4LCB) and their subsequent violations. These are in addition to their consistent coke oven battery stack opacity violations that produce high levels of particulate. I took videos of the event on March 09, 2019 that were supplied to Algoma Steel Inc., City of Sault Ste. Marie, Pinchin Ltd, and SSM MECP. You will see that the emissions were extensive and resulted in particulate being deposited into the surrounding neighborhoods Also, Algoma's pumps to their Wastewater Treatment Facility failed to operate due to lack of power and they were presumed to have discharged untreated water into the St. Mary's River. I told the local ministry in my last meeting that the time and methodology of the collection of the particulate (in the Bayview Area) and water were insufficient. Also, the fact that Algoma Steel waited over 40 minutes before notifying the Spills Action Centre (SAC) is concerning considering how bad the emissions were even at 9:55 (the call was made a 10:38). According to Algoma, the total power loss was due to a cable termination failure using older style technology prone to leaking current in their power supply.

I have applied through FOI for emissions information and a 2013 soil report (in Bayview Area) since Algoma Steel has not been willing to provide simple information like the actual values for their benzene and benzene(a)pyrene in their latest report. Mr. Fred Post (Environmental Manager) claims the numbers in their report are "worst case scenario" and not the actual numbers. My attempts to acquire the actual numbers from Mr. Post have not been successful.

Mayor Provenzano and city counsellors have not been willing to discuss any concerns regarding Algoma's emissions. I have also tried to obtain the contact information for the other members of the Algoma Community Liaison Committee through the City of Sault Ste. Marie (Catherine Taddo) and Algoma Steel Inc. (Chris Galizia and Fred Post), and no one has been willing to supply it. There appears to be little concern or scrutiny of their emissions.

I was wondering if the local ministry or Algoma gave the CLC further information regarding my concerns as I noticed that their presentation slide (from their lastest meeting) doesn't mention public complaints regarding March 09 other than a noise complaint. I also gave the ministry a picture of a very large iron emissions on April 30, 2019. I am very disappointed that I have been dealing with Algoma, the City and the local MECP since March 11, 2019 and no one even mentioned an opportunity to meet or speak with the Algoma CLC. I have attached a few things for everyone to review. I included information regarding the No.07 blast furnace to emphasize that the permanent bag house was either not working or not connected (there are many smaller events but only larger events are presented). Its is very clear that the numerous blast furnace emissions were not simple "operational upsets" but deficiencies in their operations. The permanent bag house appears to be fully operational now.

I have spent considerable time and effort to help protect the environment and the health of the citizens of Sault Ste. Marie. A lot of Algoma Steel emissions head in easterly directions from their facility and you should note that the monitors are all on the west side. The air monitoring equipment needs to be addressed in the west as well considering a report in Feb. 2018 by a thirdparty auditor (GHD) which states regarding all the dust fall jars: "Dust fall jars do not meet MECP siting criteria for locations Bonney Street, Spadina Avenue, Wilding Avenue and Adelaide Street, therefore results may be suspect". The stations are maintained by Algoma Steel and the local MECP says they do periodically inspect them. Algoma Steel and the local MECP have yet to provide the reasons they don't meet the MECP siting criteria and if there will be some resolution to this issue.

As of July 29, 2019, Mr. Don Earl of the Environmental Enforcement and Compliance branch is now reviewing these concerns. He has been advised that the US EPA will also be contacted in a few weeks for a response (requested by concerned Sault Michigan residents). I feel that the lack of environmental due diligence and willingness to address public concerns in Sault Ste. Marie is very concerning. I hope you will give serious thought and acknowledgment to my concerns. Please share this information with the members of the Algoma CLC not included on this email so they can be properly informed.

https://outlook.live.com/mail/0/search/id/AQMkADAwATYwMAltODQ0AGEtMDk3Yy0wMAltMDAKAEYAAANGQP8GfpsSTYUUmNFWYOKzBwDDXM... 1/2



Ontario 😵			En	vironmental I	Registry o	f Ontario
Home Search M	Мар	About 🗸		Register	Log in	Français
Home > Algoma Steel Ir	nc App	roval of a site-specific > Comme	nts > Sault Ste Marie lifelong			
Sault Ste N	۸ar	ie lifelong				
Comment on		Algoma Steel Inc Approval	of a site-specific air standard	d		
<u>ERO</u> number		019-2301				
Comment ID		50239				
Commenting on behalf	of	Individual				
Comment status		Comment approved More ab	out comment statuses			
Comment		Sault Ste Marie lifelong reside absolutely incredible in this to industrial development in this dangers of these chemicals ar	nt and nurse. <mark>The rate of can wn.</mark> PLEASE do not extend th area. The citizens of Sault St d their effect on our city.	i <mark>cer (in particular</mark> iis deadline noi e. Marie are no lo	lymphoma) r allow furthe onger ignora	is er toxic nt of the
				Submitted [	December 14, 3	2020 5:14 PM
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About the registry			Contact			
The Environmental Registry thoughts on actions we take Learn more.	r allows y e that co	you to comment and share your uld affect the environment.	Let us know if you have fee Contact us.	dback or questions	about the regi	stry.
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<u>Ontario.ca</u> <u>Contact</u> <u>Site</u>	map I	Privacy Terms of use		© Queen's Pri	nter for Ontari	io <u>, 1994-2021</u>

Note: There has been no response or acknowledgement to date from M.P. Sheehan

Photo 53: Public comment in 2020 from a nurse and lifelong resident regarding the cancer rates in Sault.



CTV News Northern Ontario – March 09, 2019

"I can confirm we had a temporary loss of power to the steelworks this morning. Power has now been restored and an orderly ramp up of production is underway. No injuries to report. The necessary authorities have been notified." BRENDA STENTA, MANAGER OF CORPORATE COMMUNICATION STATES CTV News Northern Ontario: <u>https://northernontario.ctvnews.ca/video?clipId=1632086</u>

# MARCH 09, 2019 TIMELINE



Photo 54: Cathcart/Huron @ 9:59 AM



# Photo 55: Cathcart Sidewalk/Marconi Hall @ 10:00 AM

	1455-DA4LCB
Telephone Client #: 5	:: (705)945-4568, FAX: (705)945-2972, email: fred.post@algoma.com 754-4JDRLV, Client Type: Corporation, NAICS: 331111
Site(s)	
Site Detai	ls
Algoma St Address: District Off GeoRefere Method: S LIO GeoR Longitude: Sewage W Site #: 175	eel Inc 105 West Street 105 West St, Sault Ste. Marie, City, District of Algoma, P6A 7B4 ice: Sault Ste. Marie ence: Map Datum: NAD83, Zone: 16, Accuracy Estimate: 1-10 metres eg. Good Quality GPS, urvey, UTM Easting: 701613, UTM Northing: 5154576, , eference: Zone: 16, UTM Easting: 702519.25, UTM Northing: 5155183.0, Latitude: 46.519733, -84.35969 /orks Number: 0000040006 i4-4NVMP9, NAICS: 331110
Incident S	summary:
Algoma St	eel: black particulate from coke oven battery
Initial Inci	dent Description (as reported):
Created: A	ikiko Date (spilis Action Centre) - 2019/03/09 10:38:05 AM
caller repo are coke o impacting power now	ons a power outage to the entire facility. Emission control system is not operating. There is no production, but t ven battery emissions. There will be a heavy emission of coal and coke dust, (black particulate) which will be the neighbourhood. Started 30 minutes ago. Unknown how long it will emitting, they are working on restoring and some parts have been restored already. Caller will update SAC when power is restored.
SAC recei	ved a complaint from a resident about seeing a lot of black smoke. IR#5767-BA4L9C
<mark>11:09</mark> - Chr power and plume. Th to site in a	is Graham - Algoma - 705-206-0466 to SAC (JA): reports that at power outage, all 3 coke oven batteries lost I steam and had the inability to process any volatiles coming off the coal. They then had to bypass causing a b ere is a constant rolling fire on top of the batteries. Lori Greco who has advised them that she will be respond bout 45 minutes. Caller will have Lori update SAC with findings. Algoma will also be updating SAC.
11:43-Jerr operations been gettir possible a	y Suurna to SACbt- Jerry is updating that power has been restored to the coke batteries at 10:45. Efforts to ge back to normal had already begun before power was restored. Emissions are still ongoing, however they have ng better. They will advise SAC when there are zero emissions and everything is fully under control All efforts re being taken to ensure they get back to normal operation- expected to be sometime this afternoon.
11:48 M incident ar the situatio	ECP-SSM Lori Greco to SAC(ad): Lori advises that Algoma Steel also contacted her and told her about the id requested her to attend. Lori does not believe her presence will be necessary. They will also be updating he on.
12:09 Ron - The incid - ERP to b	Dorscht (SSM MECP) to SAC(jt) ent has received a lot of media attention e paged
12:11 SAC	(ad) to ERP: Lori Greco was briefed. She will call SAC when she gets to the office.
13:08- Lor SAC later.	i Greco (ERP) to SAC (JA): reports that she is at the office and heading to site, ETA to site 13:20 and will upda
13:44 Pl evacuation	EOC to SAC(ad): requesting the latest update. <mark>SAC advised that the ERP has not arrived on site yet.</mark> No is have been initiated. It has not been assessed as a high health risk situation.

Photo 56: MECP Incident Report from the March 09, 2019 emissions event regarding air emissions.

#### Greco, Lori (MECP)

From:
Sent:
To:
Subject:

Greco, Lori (MECP) March 9, 2019 12:32 PM Dorscht, Ron (MECP) Re: ALGOMA

К

Get Outlook for iOS

From: Dorscht, Ron (MECP) Sent: Saturday, March 9, 2019 12:20:10 PM To: Greco, Lori (MECP) Subject: ALGOMA

Check downwind for particulate in neighborhood....and grab samples if you can...Apparently blowing into Bayview

Ron Dorscht Supervisor Ministry of Environment, Conservation, and Parks Sault Ste. Marie 705-942-6322

002325

Photo 57: Email from MECP Dorscht advising MECP Greco to collect a particulate sample in Bayview

1



Photo 58: Concerns from a resident forwarded to the MECP regarding emissions from ASI on March 09

N	Dorscht, Ron (MECP)			
	March 9, 2019 12:18 PM			
G	ireco, Lori (MECP)			
F١	wd: Black smoke from Es	sar algoma		
nt, Conserv	vation, and Parks			
		s.21		Parts Tay at the second se
, 2019 10:1	4:35 AM			
) om Eccar ala	10003			
Jin Essar alg	sonia			
<b>s.21</b> indoor day f	for quite a while and hop st after the occurrences f	Defully they won't start Can there not be for our health? It's so fr	that venting again public not be publi ustratingand	. It is so loud it c notices about
, l just want	it to stop			s.21
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**Photo 59**: Concerns from a resident to the local MECP regarding the emissions from ASI on March 09, 2019 and emphasizing the need for public consultation.

MARCH 09 EMISSIONS COMPARED TO TYPICAL EMISSIONS

Photo 60: Heavy emissions from ASI at 10:39 am photographed from Cathcart St. - March 09/19



Photo 61: A view of "normal" or typical emissions from ASI (L to R: 7,8 and 9 battery stacks) - April 24/19

Greco, Lori (MECP)	s.20
From:	
Sent:	March 9, 2019 6:38 PM
To: CC	Greco, Lori (MECP)
Subject:	Air Monitoring Stations
Hi Lori,	
I have been to our monit	oring stations at Patrick Street and Wallace Terrace with of GHD.
At Wallace Terrace we re however we were noticir we investigated we found 0. It should have been 30 much (10 or 11ug).	calibrated the TRS and our confident that is accurate. We have not had any exceedences, ng values around 9ppb (limit is 10ppb). For the PM10, we were receiving data showing 0. When d the units were in milligrams, not micrograms. For example, 0.003mg which was rounding to ug. will correct this and issue a report. We will have a few PM10 exceedences, but not by
At Patrick Street the TRS though it was done recer	is showing low, which could be correct. However I asked Sarah to recalibrate that as well, even htly.
So, it looks like we have a	all the data and a few PM10 exceedences for today.
Regards,	
Enviro	inment Ctrl Officer (Cokemkg)   Environment Control

Photo 62: E-mail from ASI to local MECP about incorrect calibration at Wallace Terrace station (Mar 09)

#### Greco, Lori (MECP)

From: Sent: To: Cc: Subject: Attachments: Jonathon Bouma <JBouma@algomapublichealth.com> March 11, 2019 1:06 PM Dorscht, Ron (MECP) Chris Spooney; Greco. Lori (MECP) Re: Call me please image001.png

Will call in 15

Sent from my iPhone

On Mar 11, 2019, at 11:54 AM, Dorscht, Ron (MECP) <Ron.Dorscht@ontario.ca<mailto:Ron.Dorscht@ontario.ca>> wrote:

#### To discuss Saturday's power outage and upset at Algoma Steel

Ron Dorscht Ron Dorscht, B.E.S. Supervisor Sault Ste. Marie Area Office Ministry of the Environment, Conservation and Parks (705)942-6322 <image001.png>

001178

Photo 63: E-mail from APH to the local MECP requesting details of the March 09, 2019 emissions event

1



#### Notes of Meeting #29 - Algoma Steel Community Liaison Committee

Date: June 4<sup>th</sup>, 2019

Location: Algoma Steel Administration Building Main Conference Room

Time: 11am to 2:00pm

#### CLC Members in Attendance

Fred Post – Algoma Steel Chris Galizia – Algoma Steel Kara Flannigan – Algoma Public Health Ron Dorscht – Ministry of Environment, Conservation and Parks (MECP) Catherine Taddo – Corporation of the City of Sault Ste. Marie Lisa Derickx – St. Mary's River RAP Coordinator Lori Greco - Ministry of Environment, Conservation and Parks (MECP) Steve Carey – Chippewa County Health Department David Trowbridge - Public Reg Dunn – United Steelworkers Local 2251 Peter McLarty – Public

Additional attendees: Scott Grant – Ministry of Environment, Conservation and Parks (MECP) Bruce Gillies – Ministry of Environment, Conservation and Parks (MECP)

#### **CLC Members not in Attendance**

Wayne Hubbard – United Steelworkers Local 2251 Patt Marquis – Public Jonathon Bouma - Algoma Public Health (alternate) Dan Sayers Jr. – Batchewana First Nations Kathie Brosemer – Sault Ste. Marie Tribe of Chippewa Indians Maggie McAuley – Corporation of the City of Sault Ste. Marie

#### Meeting Notes

- Review of the Agenda There were no new items proposed to be added to the agenda.
- 2. Review of Meeting #26 Notes There were no comments regarding the minutes of the March 5<sup>th</sup> CLC meeting. They have been posted on the company website.
- 3. Membership issues A re-cap of current membership was provided.

**Photo 64**: ACLC meeting minutes following the March 09, 2019 emissions event showing the APH members in attendance



Photo 65: Slide #15 from ACLC meeting #29 with no public complaints about air emissions on March 09

topic continues to be an issue and the company is working with the MECP to develop a detailed action plan to reduce opacity. 6. Recent Incidents A description of two incidents which occurred in Algoma's operations in the past guarter was provided. On March 9th at 9:32am, Algoma Steel experienced a total loss of commercial power for nearly one hour. The power outage resulted in the loss of cooling water and steam to the operation, which gave rise to emissions as manufacturing processes were suspended. A comprehensive investigation has identified several risk mitigation measures that Algoma Steel is undertaking to prevent a recurrence. An unplanned process upset occurred in the blast furnace in April. During the Blast Furnace re-start, safety procedures required for pressure relief and the beaching of iron resulted in emissions until the Furnace returned to normal operation. 7. Site Specific Standard for Benzene and Particulate An update was provided regarding the site specific standard for benzene. The approved standard requires continued addition to the Benzene Emission Control (BEC) system and on 2

Photo 66: ACLC Meeting #29 Minutes, June 04, 2019, only information/comments regarding the event

**Note**: There were no comments noted by APH members regarding the emissions from March 09, 2019 or discussions regarding public complaints and the discharge of untreated effluent to the St. Mary's River.

#### Site(s)

#### Site Details

Algoma Steel Inc. - 105 West Street Address: 105 West St, Sault Ste. Marie, City, District of Algoma, P6A 7B4 District Office: Sault Ste. Marie GeoReference: Map Datum: NAD83, Zone: 16, Accuracy Estimate: 1-10 metres eg. Good Quality GPS, Method: Survey, UTM Easting: 701613, UTM Northing: 5154576, , LIO GeoReference: Zone: 16, UTM Easting: 702519.25, UTM Northing: 5155183.0, Latitude: 46.519733, Longitude: -84,35969 Sewage Works Number: 0000040006 Site #: 1754-4NVMP9, NAICS: 331110

#### Incident Summary:

Algoma Steel: 6500m^3 effluent to St Marys River

#### Initial Incident Description (as reported):

Created: Julian Aristizabal (Spills Action Centre) - 2019/03/09 10:54:38 AM

Caller reports that they had power outage at 09.39 which caused a 36 minute bypass of effluent (TSS, ammonia, Morgoil (circulating oil)) to the St. Mary's River. Exact flow rate unknown but estimated at 12000m3/hour (therefore approximately 6500 m^3 discharged). Discharge was to the middle of the river and is about 300m from the US border. Caller believes that there would not be impacts to US side as it is more of a TSS issue that would settle out and the concentration of ammonia would be approx 1.5ppm, and Morgoil is less than 1ppm. At 10:30 Algoma got the power back up which caused the pumps to restart, stopping bypass by reducing the levels. They were not able to collect samples of the effluent but will take a current raw grab sample which they report will be similar to what was bypassing at the time.

Caller reports that there is a lot of ice build up so they don't expect much migration of effluent on the surface. Algoma will have someone check the area for visible impacts from shore. Outlet is aproximately 60m from shore. Algoma is currently on the phone with MECP SSM Lori Greco who has advised them that she will be responding to site in about 45 minutes. Caller will have Lori update SAC with findings. Algoma will also be updating SAC.

13:08- Lori Greco (ERP) to SAC (JA): reports that she is at the office and heading to site (see IDS# 1433-BA4LCB) , ETA to site 13:20 and will update SAC later.

Copy emailed to EC

s.20

16:00-Lori Greco to SACbt- Samples were taken from the site and had meetings with Algoma will be updatin	g
SAC when everything is back to normal. They will be writing up a full report later this week.	s.21
17:01 SACcb to POEC Duty Officer (416-314-0472): -Briefed on updated info	
17-07 SACab to Nacesi Thibe II (SSM Emoteoper) Management Constitution 706-071-0025)	

17:07 SACcb to Naomi Thibault (SSM Emergency Management Coordinator 705-971-9925). Briefed on updated info

See IR 1433-BA4LCB

Not in source water protection zone

SAC Action Class: Non-Standard Procedure: Watercourse Spills

Page 2 004385

Photo 67: MECP Incident report regarding the discharge of untreated effluent to the river on March 09

# Thick smoke seen over Algoma Steel (video, 4 photos)

We'll post additional information as it becomes available

Feb 27, 2020 1:08 PM By: SooToday Staff



SooToday has received a number of reports of thick, dark smoke coming from the area of Algoma Steel.

The accompanying reader submitted photos and vdeo were taken shortly after 11 a.m. today.

SooToday has reached out to Algoma Steel for comment and will post additional information as it becomes available.

Source: <u>https://www.sootoday.com/local-news/thick-smoke-seen-over-algoma-steel-video-4-photos-</u> 2123668

\*Note: This event was caused by the dumping of excess iron onto wet ground. There was no discussion or acknowledgement of the emissions or the public complaints about this event in the Algoma Community Liaison Committee (ACLC) meeting on March 10, 2020 following the event despite media coverage.

MECP Notifications to APH
Selva Rasaiah <selvarasaiah@hotmail.com></selvarasaiah@hotmail.com>
Fri 05/03/2021 7:52 AM
To: Liliana Bressan <lbressan@algomapublichealth.com> Cc: tcaputo@algomapublichealth.com <tcaputo@algomapublichealth.com>; <mark>jloo@algomapublichealth.com</mark> <jloo@algomapublichealth.com></jloo@algomapublichealth.com></tcaputo@algomapublichealth.com></lbressan@algomapublichealth.com>
) 3 attachments (9 MB)
Oct18_2019Flare.pdf; ERO_City_EVAL_019-2301_019-2526_SUPPORT (1).pdf; Benzene_LimitGraph_FINAL.png;
Hi Liliana,
I was wondering if APH can confirm if they were notified by the MECP about the emissions event on March 09, 2019? If so, did the MECP note any exceedances at ambient air quality stations from the Wallace Terrace Station or Patrick St. Station? Also, there was an emissions event on October 18, 2019, and I was wondering if APH was given air quality information relating to data from this incident considering the meter at Sault College did note a spike in particulate (noted on Soo Today) which ASI claims was unrelated to this incident. Also, I have attached a modified graph showing benzene and benzo-a-pyrene levels from the two stations. In the graph, 2013 was highlighted because of the significant spike and high levels over the limit (green line) for the entire year. The MECP did not investigate and said windrose data suggest other sources could have contributed. Did the MECP report any exceedances to APH in 2013 from these meters? I would appreciate any assistance and feel free to contact me for clarification. Please notify me if any of these questions require an FOI and how to ask for the documentation relating to the specific questions.
Thank you,
Selva
From: Liliana Bressan <lbressan@algomapublichealth.com> Sent: February 22, 2021 11:04 AM To: Selva Rasaiah <selvarasaiah@hotmail.com> Subject: RE: APH Cancer Report Inquiry</selvarasaiah@hotmail.com></lbressan@algomapublichealth.com>
Hello Selva,
In my online search, I was able to locate two publically available reports on air quality from Algoma Steel Inc. The Wallace location is listed. See attached and links below.
I haven't been able to track down additional reports, as there isn't a content section easily to locate on the Algoma website. Just wanted to share as this aligned with your inquiry and the reports were publically posted on google.
Regards, Lil
2019: https://www.algoma.com/wp-content/uploads/2017/05/037946-RPT-74-2019-Q2.pdf 2016: https://algoma.com/wp-content/uploads/2017/05/037946-RPT-57-2016_3Q1.pdf
From: Liliana Bressan Sent: Friday, February 19, 2021 10:04 AM To: 'Selva Rasaiah' <selvarasaiah@hotmail.com> Subject: RE: APH Cancer Report Inquiry</selvarasaiah@hotmail.com>
Hi Selva,
Absolutely – more than happy to hear from community members and share resources. Please do reach out should you have any further questions or concerns.
Have a wonderful weekend, Lil

**Photo 68:** E-mail to APH regarding ASI emissions, benzene levels and March 09, 2019 event.

**Note**: There has been no reply from any Environmental Health team member to this e-mail to date.



Photo 69: No. 7 Blast Furnace releasing untreated gas and particulate from dirty bleeder valves (not reported)



Photo 70: Heavy iron oxide emissions from the casthouse of No.07 Blast Furnace (not reported, 2<sup>nd</sup> event)



Photo 71: Heavy iron oxide emissions discharged from the #2 BOSP on July 13, 2019 (not reported)



Photo 72: Very high opacity (>80%) acrid stack emission from No. 7 Battery on May 07, 2019



Photo 73: High particulate haze from emissions emanating from ASI on July 31, 2019

# JULY 01, 2020







Photo 74: High particulate haze from emissions emanating from ASI on July 01, 2020

# **Breast**Care

**Review Article** 

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Published online: July 15, 2015

# **Polycyclic Aromatic Hydrocarbons and Breast Cancer: A Review of the Literature**

Jessica Korsh Allison Shen Kristen Aliano

**Thomas Davenport** 

Long Island Plastic Surgical Group, Garden City, NY, USA

#### **Keywords**

Polycyclic aromatic hydrocarbon · PAH · Breast cancer

#### Summary

Polycyclic aromatic hydrocarbons (PAHs) exist and persist in the atmosphere due to the incomplete combustion of fossil fuels, and are established human carcinogens. The influence of PAHs on the development of breast cancer, the most commonly diagnosed cancer in women worldwide, remains unclear. As established risk factors only account for approximately 41% of the breast cancer cases in the USA, researchers have sought to uncover environmental factors involved in breast cancer development. The breasts are particularly susceptible to aromatic carcinogenesis, and the implementation of biomarkers has provided promising insights regarding PAH-DNA adducts in breast cancer. The use of biomarkers measuring PAH-DNA adducts assesses exposure to eliminate the bias inherent in self-reporting measures in case-control studies investigating the link between PAHs and cancer. Adduct levels reflect exposure dose as well as how the body responds to this exposure, which is partially attributable to genetic variability. Evidence suggests that exposure to PAHs has a causational effect on breast cancer in humans, yet this interaction is not clearly understood. In vitro and animal-based studies have consistently revealed that exposure to PAHs deleteriously affects breast tissue, but there is no definitive link between these compounds and breast cancer.

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#### Introduction

Polycyclic aromatic hydrocarbons (PAHs) exist and persist in the atmosphere due to the incomplete combustion of fossil fuels, and are established human carcinogens in the lungs. Additionally, oral uptake of PAHs may also occur via consumption of smoked and grilled meat and fish, and dermal exposure to PAHs may result from the use of consumer products that contain black rubber. However, the influence of PAHs on the development of breast cancer, the most commonly diagnosed cancer in women worldwide, remains unclear [1]. Given that established risk factors only account for approximately 41% of the breast cancer cases in the USA, researchers have sought to uncover environmental factors involved in breast cancer development [2, 3].

PAHs are a group of over 100 chemicals, usually occurring as mixtures. According to the Agency for Toxic Substances and Disease Registry, PAHs have been identified in 600 of the 1,430 National Priorities List sites identified by the United States Environmental Protection Agency (USEPA) [4]. PAHs are produced due to the incomplete combustion of hydrocarbons, fossil fuels (coal and gas), and biomass for energy production. PAHs produced from these processes include: benz(a)pyrene (BaP), dibenz(ah)anthracene (DB(ah)A), 1-nitropyrene (1-NP), and 7,12-dimethylbenz(a) anthracene (DMBA), as well as the monocyclic hydrocarbon benzene, all of which are established experimental breast carcinogens [3]. Currently, benzene, BaP, and DB(ah)A are listed as priority pollutants by the USEPA; priority pollutants are chemical pollutants the USEPA regulates and for which it has established analytical test methods [5]. The concentration of benzene in the atmosphere is. mainly attributed to automobile use; as such, the highest concentrations exist around highways and high-traffic urban areas. The benzene content in gasoline ranges from < 1% to 15%, depending on the country [6]. Benzene also serves as a chemical intermediate for various products, including ethylbenzene (used to make styrene), many of which ultimately aid in the production of plastics and pesticides [6]. Benzene and other PAHs are also produced from the burning of wood and organic material, and it is found in tobacco smoke. Moreover, humans can also be exposed to PAHs through the consumption of smoked and grilled foods. As a hydrophobic compound, PAHs can be absorbed through the dermis [7]. It has been established that benzene, through inhalation or ingestion, is a multipotential carcinogen. The PAHs BaP, DB(ah)A, and 1-NP have all been proven to induce breast tumors in animals [3].

#### **Results and Discussion**

The breasts are particularly susceptible to aromatic carcinogenesis. Fat cells can store and concentrate aromatic carcinogens [2], and breasts are largely composed of fat. PAHs can be harbored in mammary and other fat tissues [3]. Several in vitro studies have shown that, in breast epithelial tissue, PAHs are metabolized to their most potent and deleterious state [8–10], ultimately affecting cellular morphology as well as cellular division, growth, and repair. Furthermore, the cells in these studies displayed anchorage independence, a potential reflection of tumorigenicity [10]. Multiple experiments have shown that PAH induces mammary neoplasms in animals [11, 12]. p53 mutations have been implicated in breast cancer and, in fact, approximately half of all human cancers have a p53 mutation [13–15]. Mordukhovich et al. [16] concluded that PAHs may alter the effect, type, and number of p53 mutations.

The use of biomarkers in measuring PAH-DNA adducts has been implemented to assess exposure to eliminate the bias that is inherent with self-reporting measures in case-control studies that have investigated the link between PAHs and cancer. Adducts appear to be instrumental in the development of mutation and cancer, although the precise relationship is not understood [17]. Adduct levels reflect exposure dose as well as how the body responds to this exposure, which is partially attributable to genetic variability [18, 19]. In essence, exposure and repair or detoxification are at odds with one another; thus, when either exposure exceeds detoxification or detoxification alone is insufficient, PAH-DNA adducts form [7], predisposing one to abnormal cellular growth and division. A study conducted by Rundle et al. [17] that controlled for known breast cancer risk factors indicated that inter-individual variation in metabolic and/or DNA repair pathways may play a significant role in breast cancer. Rundle and colleagues also investigated the relationship between PAHs and polymorphisms in the glutathione S-transferase M1 (GSTM1) gene, which is known to be highly polymorphic and involved in the detoxification of carcinogenic compounds [20]. Rundle et al. [8] concluded that GSTM1 polymorphisms play a role in predicting adduct levels for cases but not controls. Evidence suggests that the XPD gene (also called ERCC2), which has numerous single-nucleotide polymorphisms and is involved in nucleotide excision repair, may influence an individual's ability to repair DNA from bulky DNA adducts [21]. Polymorphisms in the XPD gene, such as the Asn/Asn or Gln/Gln genotypes, may be associated with greater PAH-DNA adduct levels in tumor tissue [22]. Shen et al. [23] investigated the relationship of polymorphisms in X-ray repair cross-complimenting group 1

(XRCC1), an important DNA base excision repair gene, and breast cancer risk. Two polymorphisms, Arg194Trp and Arg399Gln, do not appear to directly influence breast cancer risk. Among neversmokers, a suggestive additive interaction was observed between the XRCC1 399Gln allele and PAH-DNA adducts. Yet, XRCC1 194Trp carriers, through high fruit and vegetable consumption, may have a decreased breast cancer risk.

XO In 1996, Li et al. [2] assessed aromatic adducts in human tissue from breast cancer patients undergoing mastectomy versus breast tissue from non-cancer patients undergoing reduction mammoplasty. Aromatic DNA adducts, although detected in all samples, were significantly higher in the breast cancer patients versus the healthy controls (p < 0.01); therefore, these results indicate that PAHs may play a role in the development of breast cancer. The Long Island Breast Cancer Study Project (LIBCSP), conducted from 1992 to 1996 in response to concerns about environmental effects on breast cancer risk in Long Island, NY, showed that the average level of PAH-DNA adducts measured per 108 nucleotides was only minimally greater in breast cancer patients than in the controls (5.48 vs. 5.37). Additionally, the data suggested that the effect of PAH adduct levels may be enhanced in premenopausal women (overall response (OR) 1.56) [24]. Rundle et al. [8] conducted a case-control study including women with benign breast disease (BBD) as controls. This study showed that PAH-DNA adduct levels were significantly greater in tumor tissue from breast cancer patients versus benign tissue from women with BBD (OR 2.40). However, there was no significance between adduct levels in non-tumor tissue from breast cancer patients versus the BBD controls (OR 1.97)

The LIBCSP analyzed peripheral mononuclear cells and not breast tissue to assess the PAH-DNA adducts; Gammon et al. [24] and Perera and Rundle [25] indicate that this method may not be as accurate, yielding lower measurements than from breast tissue. Rundle et al. [8] have also opted to include women diagnosed with BBD as controls, in contrast to tissue from women undergoing reduction mammoplasty. However, they acknowledge that selection bias may inadvertently result from selecting women with BBD as controls. Rundle et al. [8] note that tissue adducts assessed by immunohistochemical assays, as in their study, are scored by individuals and there is no standard method for scoring; thus, there may be variability between reviewers and studies. Regardless of the tissue from which PAHs are assessed, it is not a strong measure of long-term exposure [24]. A possible confounder associated with the LIBCSP was attenuation. The results of studies with larger sample sizes can become nullified, versus smaller studies in which variations are more evident [24, 26, 27].

In examining the potential relationship between PAHs and breast cancer, it is also crucial to consider the geographic location and socioeconomic status of the patients. Studies conducted in Western New York in 2005 and 2007 have noted the necessity of investigating exposure to PAHs in relation to the location where patients resided during various critical periods in their lives, such as at the times of menarche and first birth [28, 29]. Furthermore, in response to reports of high breast cancer mortality rates in the North-
eastern USA, a 1997 study of the region was conducted; this study found statistically significant clusters of breast cancer deaths in the New York City-Philadelphia metropolitan area, particularly in affluent suburban communities with ample access to health care [30]. The researchers noted that they were unaware of any studies indicating greater exposure to PAHs in these communities, but it is nonetheless worth considering environmental conditions as a contributing factor to breast cancer mortality rates, as such factors can vary widely with location. Subsequent research conducted among breast cancer patients in one such significant suburban cluster -Long Island, NY - reported that PAH-DNA adduct levels were higher, albeit not significantly, among this area's breast cancer patients than in the control population [31]. The researchers in this study also observed a 50% increase in breast cancer risk for patients in the highest quintile of PAH-DNA adduct levels, even after accounting for potential confounding factors. Such results indicate that further research is required to understand the risks of exposure to PAHs as they relate to geographic and socioeconomic factors.

## Conclusions

PAHs, released by use of fossil fuels and biomass for energy production, are established carcinogens to other parts of the body [3, 19]. Evidence suggests that exposure to PAHs has a causational effect on breast cancer in humans, yet this interaction is not clearly understood. In vitro and animal-based studies have consistently revealed that exposure to PAHs deleteriously affects breast tissue, while the implementation of biomarkers has provided promising insights regarding PAH-DNA adducts in breast cancer. Environmental exposure to PAHs produced by fuel combustion, especially as mediated by geographic region and socioeconomic status, must be taken into account as researchers strive to understand the effects of PAHs on breast cancer risk.

## **Disclosure Statement**

None of the authors have anything to disclose or have any conflicts of interest.

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Heavy particulate haze and banding seen from Wallace Terrace and Lyons Ave. on March 20, 2021