Preliminary Response to NPRI Oil Sands Air Emissions Data Quality Action Plan Draft for Discussion
March 2024

Submitted to: Anne Monette, National Pollutants Release Inventory, Environment and Climate Change Canada

Prepared by: Paul Belanger, Crystal Stamp-Cardinal, Keepers of the Water
Contributions by: Fe de Leon, Canadian Environmental Law Association, John Jackson, Citizens' Network on Waste Management

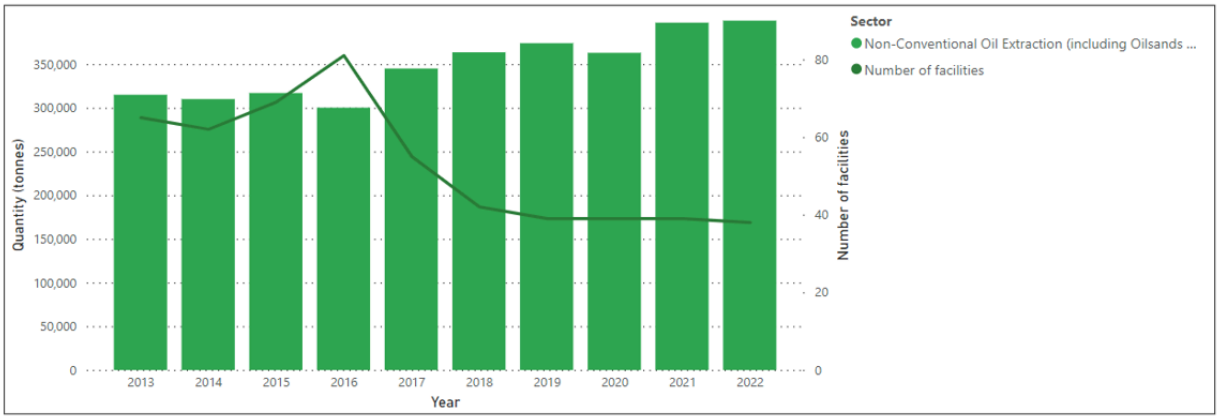
RE: NPRI Oil Sands Emission Action Plan. Do we have Data Quality?

Concerned Members,

The work of the NPRI continues to be an important and evolving effort to properly tabulate emission data from facilities Canada-wide. Here we would like to discuss specifically the reporting of emissions from the NE Alberta oil sands operations which includes both the oil sands mining operations and steam-assisted gravity drainage (SAGD) operations. Both of these operations rely on bitumen production technologies, and the companies that use them are expanding production. This means pollution emissions are also increasing.

Using NPRI's Dashboard search by sector for 'Releases to Air' by 'Non-conventional Oil Extraction (including Oilsands and Heavy Oil) in 'Alberta' does show a trend that the quantity (tonnes) of air releases has increased with a decrease in the number of facilities over the past 6 years.

Releases, disposals and transfers (by sector):



Total reported quantity (tonnes), by sector

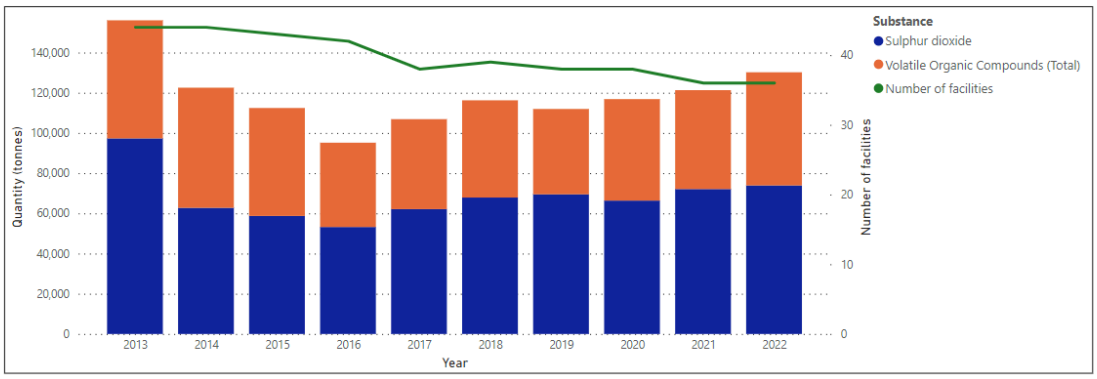
Sector	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Non-Conventional Oil Extraction (including Oilsands and Heavy Oil)	314,909.62	310,018.75	316,952.22	300,150.87	344,980.53	363,585.09	373,996.18	362,940.14	397,478.67	399,812.17

Source: National Pollutant Release Inventory Dashboard, By Sector, Releases to Air, Non-conventional Oil extraction in Alberta, March 2024.

Searching by substance for ‘Releases to Air’ by ‘Non-conventional Oil Extraction (including Oilsands and Heavy Oil) in ‘Alberta’ also demonstrates a trend that the quantity (tonnes) of SO2 and VOCs has increased with a decrease in the number of facilities over the past 6 years.

Releases, disposals and transfers (by substance):

*This graph can only display data for a limited number of substances at one time and should only be used once one of more filters have been applied. Complete data is available in the table below the graph.



Total reported quantity by substance

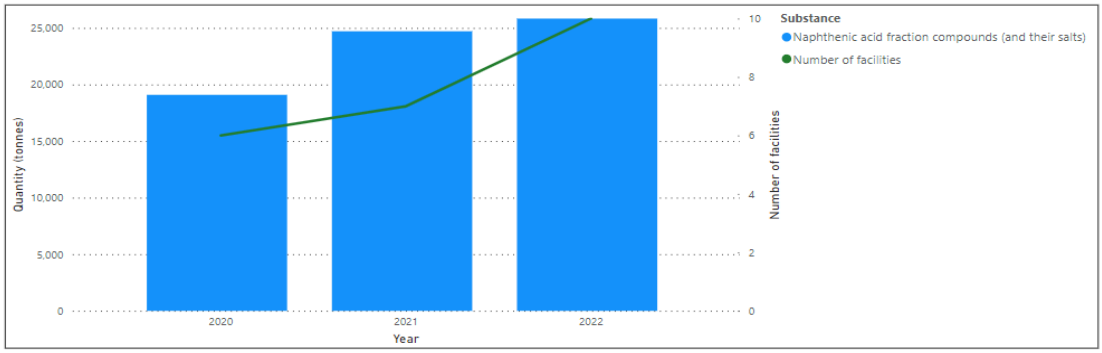
Part	Substance	CAS Number	Units		2015	2016	2017	2018	2019	2020	2021	2022
4	Sulphur dioxide	7446-09-5	tonnes	69.80	58,725.79	53,225.14	62,112.15	67,882.61	69,486.92	66,362.98	72,110.46	73,898.59
	Volatile Organic Compounds (Total)	NA - M16	tonnes	63.89	53,699.05	41,943.06	44,756.62	48,369.06	42,460.18	50,496.02	49,204.65	56,298.77

Source: National Pollutant Release Inventory Dashboard, By Substance, SO2 and VOCs, Non-conventional Oil Extraction in Alberta, March 2024

Searching by substance for releases of Naphthenic acid fraction compounds (and their salts) by ‘Non-conventional Oil Extraction (including Oilsands and Heavy Oil) in ‘Alberta’ also demonstrates a trend that the quantity (tonnes) has increased since reporting began in 2020.

Releases, disposals and transfers (by substance):

*This graph can only display data for a limited number of substances at one time and should only be used once one of more filters have been applied. Complete data is available in the table below the graph.



Total reported quantity by substance

Part	Substance	CAS Number	Units	2020	2021	2022
1a	Naphthenic acid fraction compounds (and their salts)	NA - 47	tonnes	19,088.18	24,707.37	25,829.72

Source: National Pollutant Release Inventory Dashboard, By Substance, Naphthenic Acid fraction compounds (and their salts), Non-conventional Oil Extraction in Alberta, March 2024.

This is a complicated topic and in the near future requires a technical group to evaluate the numerous sources of emissions in a large and complex industry. This document is intended to give a priority overview without the burden of the technical content.

From the point of view of a group which lives in Northern Alberta this is what we see as important considerations when looking to improve the quality of oil sand emission reporting.

1. Need for greater validation of emission data submitted by reporting facilities: Lack of Trust of the Data Reported by Industry.

Recently a report titled: Total organic carbon measurements reveal major gaps in petrochemical emissions reporting, was published in the journal *Science*, January 25th, 2024 DOI: 10.1126/science.adj62 and well summarized in a *Guardian* article here: https://www.theguardian.com/environment/2024/jan/25/canadian-tar-sands-pollution-is-up-to-6300-higher-than-reported-study-finds where it was reported that independent collected data showed underreporting by the oil sands industry by 1900 to 6300% depending on the substance. This serious data shortfall critically needs to be corrected. It undermines our efforts to assess cumulative impacts and efforts to calculate human health risks in the area.

The emissions measured represented approximately 1% of extracted petroleum and were equivalent to those from all other sources across Canada combined, the scientists reported. With this new confirmed knowledge, we need swift action. The current regulatory regime has allowed massive under reporting and the NPRI needs to improve its ability to acquire more accurate data. Its credibility is at stake. Does the NPRI or any other government regulatory level have the resources to audit submitted information?

Although many people were surprised by the massive volume of the different reported vs actual it did not surprise any of the locals - for many years this underreporting was common knowledge in the FN communities.

Recommendation: The Action Plan should include an investigation to address the discrepancy of the air releases reported from the oil sands sector to determine and identify the gaps in the NPRI reporting framework.

2. Slow Reporting by Industry

Because of the huge air emission volumes related to the oil sands industry, on time reporting is critical. As others have stated, we need 2022 data in 2023, 2023 data in 2024. We need this data in a timely manner to add to our regional risk assessment and the need to respond to any trends before it may be too late. How can it be so slack to allow industry to get away with this?

Recommendation: The Action Plan should consider options for improved reporting from this sector including but not limited to more frequent reporting of air releases of pollutants through NPRI.

3. Full Emission Accounting from All Major Sources

This requires a full understanding of how the industry operates. Our staff possess extensive experience in this sector including 13 years' experience in the oil and gas industry, two years with heavy oil. Here are the significant emission sources which need to be reported separately.

This list is based on our experience and knowledge of the oil sands industry. All but F below are air emissions. F refers to Naphthenic Acid which is a key water pollutant of concern in the oil sands area.

A. Bitumen upgraders, both in the Fort McMurray area and in Fort Saskatchewan This is related to massive SO2 and NOx emissions.

B. Mine site plants mostly burning methane for heat energy, these plans also emit large amounts of VOCs and PAH's

C. Fugitive mine face emissions: Underground the hydrocarbons in the oil sand ore are locked in place. Once exposed, the hydrocarbons go through numerous redox reactions and gases are released to the air. The smell is sharp and bites the nose. What does the NPRI know about the volume of fugitive emissions from the mine face?

D. Off gases released from the tailings ponds: This is massive and needs to be reported separately. The gases from the tailings ponds spread throughout the region, including in Fort McKay and in the numerous work camps. The brew of different hydrocarbons in the tailing ponds include solvents such as benzene and toluene along with the 12% of the bitumen that is not recovered in the extraction. process. Surface oxidation reactions cause a massive amount of methane to rise into the air from the tailing ponds along with VOC's which will eventually breakdown to methane and CO2 higher in the atmosphere.

   The emissions from the tailings ponds are the demon of the oil sands - both for human health and greenhouse gas tracking reasons. The emissions mass from the tailings ponds amount to over **10 million tonnes per year.**[1]

E. Diesel Emissions: the emissions from the large number of large and small diesel trucks operating 24 hours a day is massive; these emissions need to be reported and captured. This adds to the large number of diesel excavators at the mine sites,

[1] 1. University of Alberta Study: Modelling of GHG Emissions From Tailings Ponds Based On Fermentable Substrates, Zvonko Burkus, 2014. Accurate CO2 equivalent calculation suggest an actual value of over 10 Million tonnes per year, not 5.5 M as claimed in the above report. Reference: Lena Höglund- Isaksson, Bottom-up Simulations of Methane and Ethane Emissions from Global Oil and Gas Systems 1980 to 2012, published in Environmental Research Letters, Feb 1, 2017.

operating, again 24 hours per day. This contributes to several toxic sulfur substances. This high volume emission source is concentrated in the mine sites and spreads to the city of Fort McMurray due to the high volume of traffic back and forth.

F. Naphthenic Acids: Although Naphthenic Acids (NA) are naturally occurring in small quantities, studies have shown that it is biodegradable when exposed to the air and sunlight, as is the case with continual erosion which exposes oil sands ore along the Athabasca River. The massive volume of the excavated oil sand ore liberates a large dangerous volume of NA. A study from 2005 shows that 100 tonnes per day of NA is processed in the oil sands mining industry in NE Alberta.[2]

   This NA ends up in the tailings ponds, in the processed bitumen and in the local watershed. For this reason, this substance needs to be tracked closely. NA volumes reported by industry need to be scrutinized carefully considering NA is highly toxic and is known to be a hormone disruptor.

G. Well fracking: Over the years, in Alberta, we have come to understand the dangerous impacts of fracking. These impacts must be observed, properly reported and managed with a competent regulatory structure. In other forms of pollution it is clear where the reported emissions are going; such as a stack emitting into the "atmosphere". With fracking, potentially sloppy geology work by the oil company may result in large volumes of toxic chemicals contaminating a fresh water aquifer. Frack reporting must state which aquifers are at risk. There are numerous proven examples of rural well water contamination.

   In addition, all substance quantities in frac fluid must be reported, regardless if listed as toxic or not. This is due to the fact that there are unknown reactions with deep well geology and metals. Finally, we have documented examples throughout Western Canada of serious air quality and air emission issues when the frack well is tested and a release of vapour is opened from the well. This results in a widespread mist in the well area, usually of undefined airborne compounds. A review is required to manage the environmental and health risk posed by this and all aspects of well fracking.

Getting accurate and timely reporting of all major emissions sources from the oil sands of NE Alberta would vastly improve the value of the NPRI.

Recommendation: The NPRI Working Group should include a close examination of the scope of pollutants as listed above and others to be identified relevant to this sector under the draft Action Plan with a commitment to examine the appropriateness of current reporting thresholds.

Thank you/Mérci/ay hay/Mahsi Cho/Miigwech

[2] A Review of the Occurrence, Analyses, Toxicity, and Biodegradation of Naphthenic Acids. Clemente and Fedorak, 2005. Chemosphere, 60: 585-600