



---

## ENVIRONMENTAL POLLUTANTS - SOURCES

In this section:

<b>1.0 EMISSIONS INVENTORIES .....</b>	<b>1</b>
<b>2. AGRICULTURE .....</b>	<b>9</b>
<b>3. FORESTRY .....</b>	<b>18</b>
<b>4. LARGE INDUSTRIAL AND COMMERCIAL EMITTERS .....</b>	<b>25</b>
<b>5. CONTAMINATED SITES AND MINE TAILINGS .....</b>	<b>54</b>
<b>6.0 COMMON CONTAMINANTS ASSOCIATED WITH VARIOUS ACTIVITIES .....</b>	<b>100</b>

## 1.0 EMISSIONS INVENTORIES

An emissions inventory is a database that lists, by source, estimated amounts of air pollutants discharged into the atmosphere of a community during a given time period.<sup>1</sup> Environment Canada estimates emissions to air of some common known or suspected carcinogens from a wide range of sources in Manitoba every year:<sup>2</sup>

- **Fine particulates (PM<sub>2.5</sub>).** PM<sub>2.5</sub> is produced by many different sources, but mostly from those burning fossil fuels. It is a known carcinogen – there is very strong evidence that breathing in PM<sub>2.5</sub> increases your chance of getting cancer.
- **Volatile organic compounds (VOCs).** VOCs are produced by human activities like industrial processes, burning fossil fuels or wood, or off-gassing from fuels, paints, solvents and cleaning products. There are many natural sources as well, including odors produced by trees and plants, forest fires, animal waste and even microbes. Environment Canada's estimate is for VOCs as a group, but only some of these are linked to cancer, for example, benzene, ethylbenzene, formaldehyde, acetaldehyde, butadiene, and others.
- **Lead and cadmium.** Lead and cadmium are heavy metals that remain in the environment for a long time and can be transported long distances when emitted to the air. They can occur naturally, but most of the lead and cadmium pollution comes from burning fossil fuels and metal mining and refinery processes. Lead and cadmium can also be present in leachate from landfills and waste storage sites containing metals and batteries. Inorganic forms of lead are probable carcinogens; organic forms of lead are possible carcinogens. Cadmium is a known carcinogen when inhaled.
- **Mercury.** Mercury is also a heavy metal that remains in the environment for a long time and can be transported long distances. It is released to the air by burning fossil fuels (especially coal) and also through some industrial processes. Mercury is not known to increase cancer risk, but it can cause severe nerve damage, especially in growing babies before they are born. When mercury gets into lakes and streams, it is easily converted to **methylmercury**, which is a possible carcinogen and can accumulate in fish and seafood to harmful levels.
- **Dioxins/Furans.** Dioxins and furans belong to a group of chemicals that are very similar. Most are not made on purpose, but are byproducts of other processes, especially herbicide manufacturing, pulp and paper manufacturing, and incinerating waste. Burning wood or garbage at home can also produce dioxins and furans. Dioxins and furans can accumulate in the fat of animals and eating food is the most likely way of being exposed. The most toxic is 2,3,7,8-tetrachloro-p-dibenzo-dioxin (TCDD), a known carcinogen.

---

<sup>1</sup> [http://www.epa.gov/airquality/aqmpportal/management/emissions\\_inventory/](http://www.epa.gov/airquality/aqmpportal/management/emissions_inventory/)

<sup>2</sup> [http://ec.gc.ca/inrp-npri/donnees-data/ap/index.cfm?do=ap\\_result&process=true&sector=&lang=en&year=2013&substance=all&location=MB&submit=Submit&div=0](http://ec.gc.ca/inrp-npri/donnees-data/ap/index.cfm?do=ap_result&process=true&sector=&lang=en&year=2013&substance=all&location=MB&submit=Submit&div=0)

- **Hexachlorobenzene (HCB).** HCB is a long lasting fungicide that was used to control fungus on plant seeds, especially wheat. It has not been used for agriculture in Canada since 1972, but it is still present in some agricultural soils and can become airborne when those soils are tilled. Small amounts are also produced unintentionally, as byproducts when manufacturing chlorinated solvents and pesticides. HCB is a possible carcinogen.
- **Polycyclic aromatic hydrocarbons (PAHs).** PAHs are a group of over 100 different chemicals. The main source of PAHs is burning organic matter, such as fossil fuels (coal, gas, oil), wood, tobacco, garbage and even grilling meat. They can be produced naturally from forest fires and even evaporate from oil seeps. The Environment Canada estimate is for total PAHs, but only some of these are linked to increased cancer risk, for example benzo[a]pyrene is a known carcinogen; chrysene, indeno(1,2,3-cd)pyrene, benz[a]anthracene, benzo[b]fluoranthene, and benzo[k]fluoranthene are all possible carcinogens.

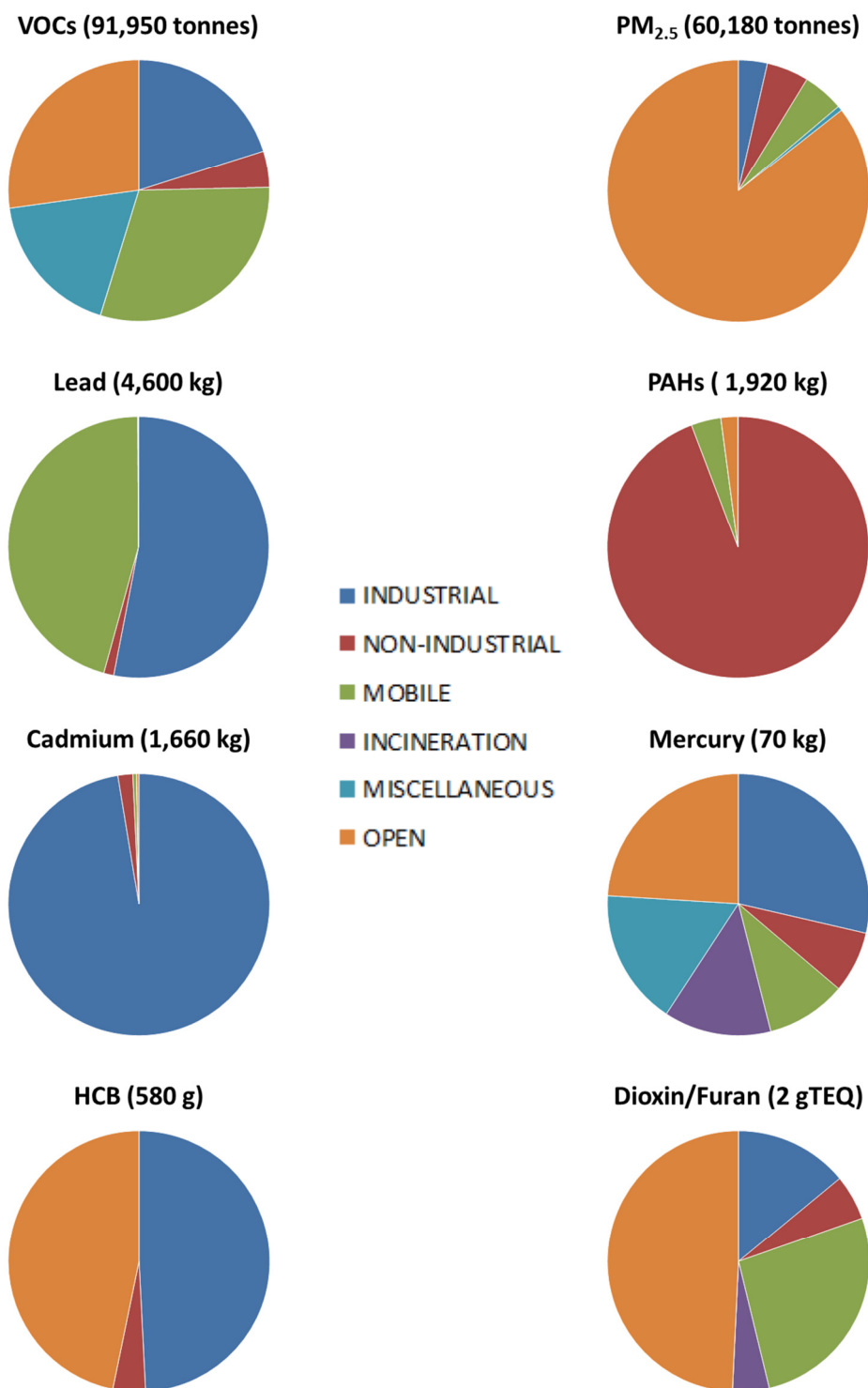
The Environment Canada estimates for emissions to air of these substances by major source categories for the year 2013 are shown in Figure 1.1. Table 1.1 provides lists of the kinds of activities included in each source category. In 2013, it was estimated that:

- 91,950 tonnes of VOCs were emitted from a variety of sources;
- 60,180 tonnes of PM<sub>2.5</sub> was emitted, mostly from open sources;
- 4.6 tonnes of lead was emitted, mostly from industrial and mobile (vehicle exhaust) sources;
- 1.9 tonnes of PAHs were emitted, almost entirely from non-industrial sources;
- 1.7 tonnes of cadmium were emitted, almost entirely from industrial sources;
- 70 kilograms of mercury were emitted from a variety of sources;
- Less than 1 kilogram of HCB was emitted, almost entirely from industrial and open sources;
- About 2 grams of Dioxin/Furan were emitted, about half coming from open sources, and the remainder coming from various source categories.

Figures 1.2 to 1.6 show how the Environment Canada estimated emissions have changed since 1990. Most notably:

- VOC emissions have been declining;
- PM<sub>2.5</sub> and PAH emissions have remained about the same;
- Lead, cadmium, mercury and HCB emissions have been declining; and
- Dioxin/Furan emissions have varied since 2006, but have not declined.

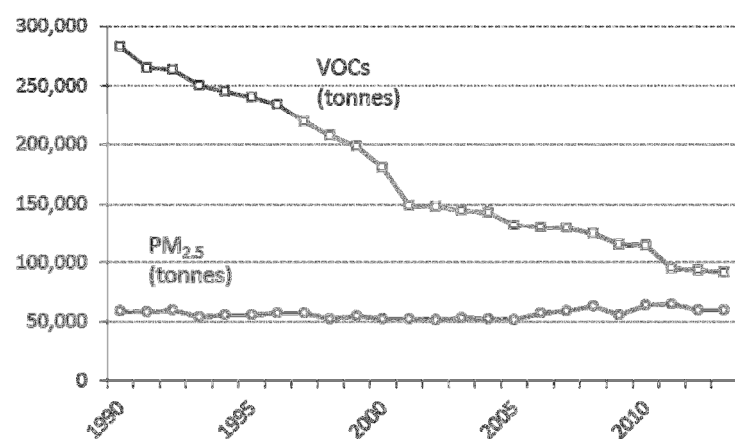
These emissions estimates are calculated by combining activity data (how much a factory produces, or how many total kilometers travelled by all drivers in Manitoba annually) with emission factors for each pollutant (kilograms of arsenic per tonne of metal refined, or kilograms of benzene per kilometre driven). Because these inventories are not based on actual measurements from every source, there may be errors. In reality, it is impossible to measure every pollutant from every single source, so emissions inventories are widely used as the next best option.

**Figure 1.1. Environment Canada Estimates of Emissions to Air – Manitoba - 2013<sup>3</sup>**

<sup>3</sup> [http://ec.gc.ca/inrp-npri/donnees-data/ap/index.cfm?do=ap\\_result&process=true&sector=&lang=en&year=2013&substance=all&location=MB&submit=Submit&div=0](http://ec.gc.ca/inrp-npri/donnees-data/ap/index.cfm?do=ap_result&process=true&sector=&lang=en&year=2013&substance=all&location=MB&submit=Submit&div=0)

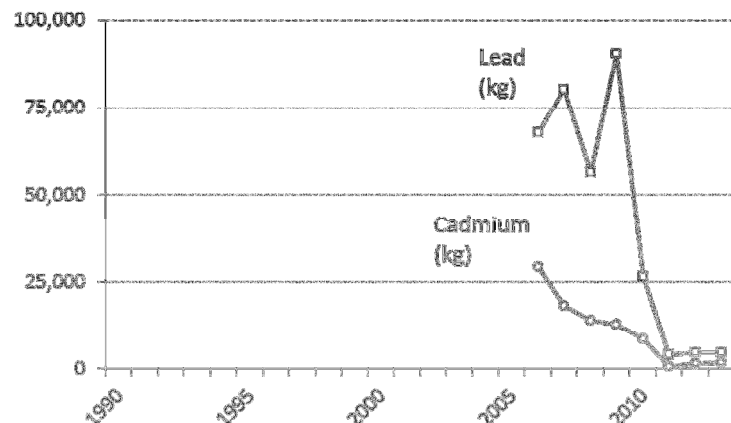
**Table 1.1 Activities included in the Environment Canada Emissions Inventory categories**

Industrial:	Asphalt paving; cement and concrete manufacturing; chemical manufacturing; mineral products; foundries; grain industries; iron and steel recycling; mining and rock quarrying; non-ferrous smelting and refining; pulp and paper industry; wood products; petroleum production, processing, storage and transmission; metal fabrication; vehicle manufacturing; electronics industry; plastics manufacturing; food preparation; bakeries.
Non-Industrial:	Commercial fuel combustion; electric power generation (coal, natural gas, other); residential fuel combustion; residential wood combustion.
Mobile:	Air transportation; heavy and light duty vehicles; marine transportation; motorcycles; off-road diesel, gas and LPG use; rail transportation; tire wear; brake lining wear.
Incineration:	Crematoria; industrial and commercial incineration.
Miscellaneous:	Cigarette smoking; dry cleaning; general solvent use; meat cooking; gas stations; printing; building fires; surface coatings.
Open:	Agriculture (animals, tilling and wind erosion, fertilizer application and fuel combustion); construction operations; dust from paved roads, unpaved roads and coal mining; landfills; water and sewage treatment; open burning; prescribed burning; mine tailings.

**Figure 1.2 Trends in Estimated VOC and PM<sub>2.5</sub> Emissions – Manitoba – 1990 to 2013**

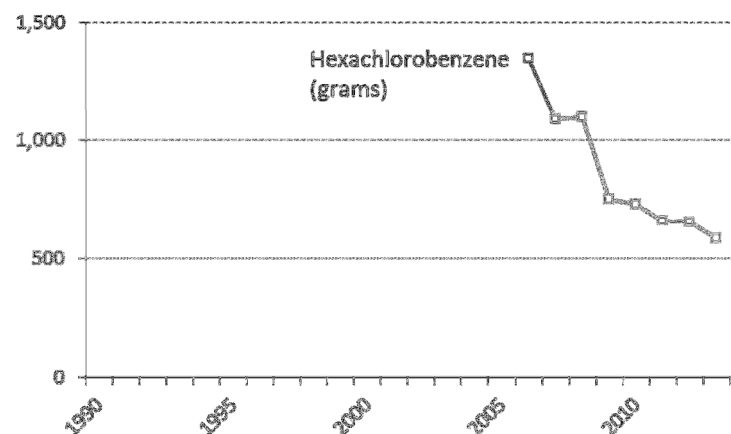
Estimated VOC emissions have been steadily declining since 1990. Industrial and open source emissions have been slowly rising but this has been greatly offset by significant improvements in emissions from mobile sources (now 10 times lower).

Estimated PM<sub>2.5</sub> emissions have remained the same.

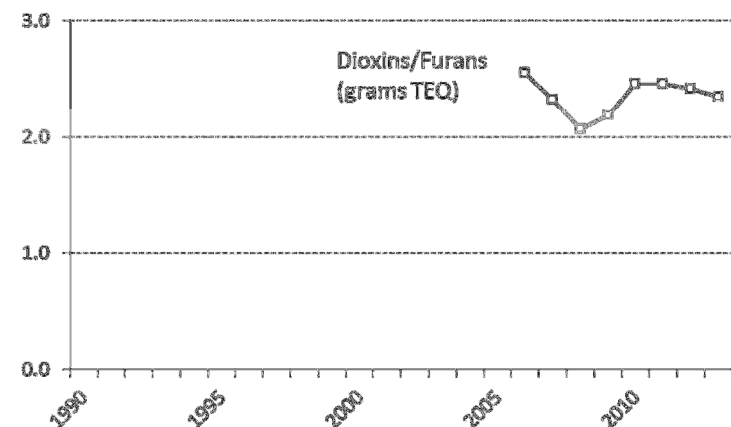
**Figure 1.3 Trends in Estimated Lead and Cadmium Emissions – Manitoba – 1990 to 2013**

Estimated lead emissions have dropped significantly since 2005, due to the June 2010 closure of the HudBay Inc. zinc-copper smelter in Flin Flon, after 70 years of operation.

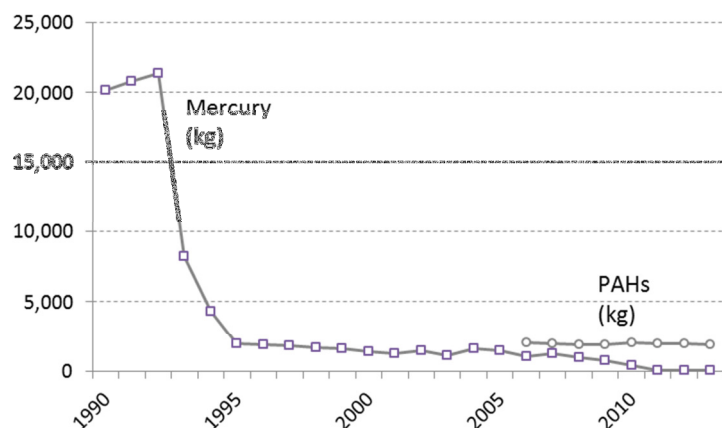
Estimated cadmium emissions have also declined for the same reason.

**Figure 1.4 Trends in Estimated Hexachlorobenzene Emissions – Manitoba – 1990 to 2013**

Estimated hexachlorobenzene emissions have declined since 2006. Industrial emissions are 288 g now compared to 967 g in 2006, mostly due to the Flin Flon smelter closure in 2010. Non-industrial emissions are 24 g now compared to 117 g in 2006.

**Figure 1.5 Trends in Estimated Dioxin/Furan Emissions – Manitoba – 1990 to 2013**

Estimated emissions of dioxins/furans have varied but remained similar since 2006.

**Figure 1.6 Trends in Estimated Mercury and PAH Emissions – Manitoba – 1990 to 2013**

Estimated emissions of mercury declined sharply between 1990 and 1995 due to a change in processing methods at the Flin Flon zinc-copper smelter in 1993<sup>4</sup> (estimated at 20,000 kg in 1990, 1,740 kg in 1995, and 20 kg in 2013). Steady declines have occurred in all other source categories as well.

Estimated emissions of PAHs have remained stable since 2006.

Emissions estimates are also available from the CAREX Canada Emissions Mapping Project (EMP). The CAREX EMP does not include all of the same sources or substances as the Environment Canada emissions inventory, so the estimates are not exactly the same. The CAREX EMP is focused in 18 specific substances that are known, probable, or possible carcinogens and includes PM<sub>2.5</sub>, lead, cadmium, and specific VOCs (benzene, acetaldehyde, formaldehyde, ethylbenzene, and butadiene) and PAHs (chrysene, benzo[b]fluoranthene, benzo[a]pyrene, indeno(1,2,3-cd)pyrene, benz[a]anthracene and benzo[k]fluoranthene). Also included are:

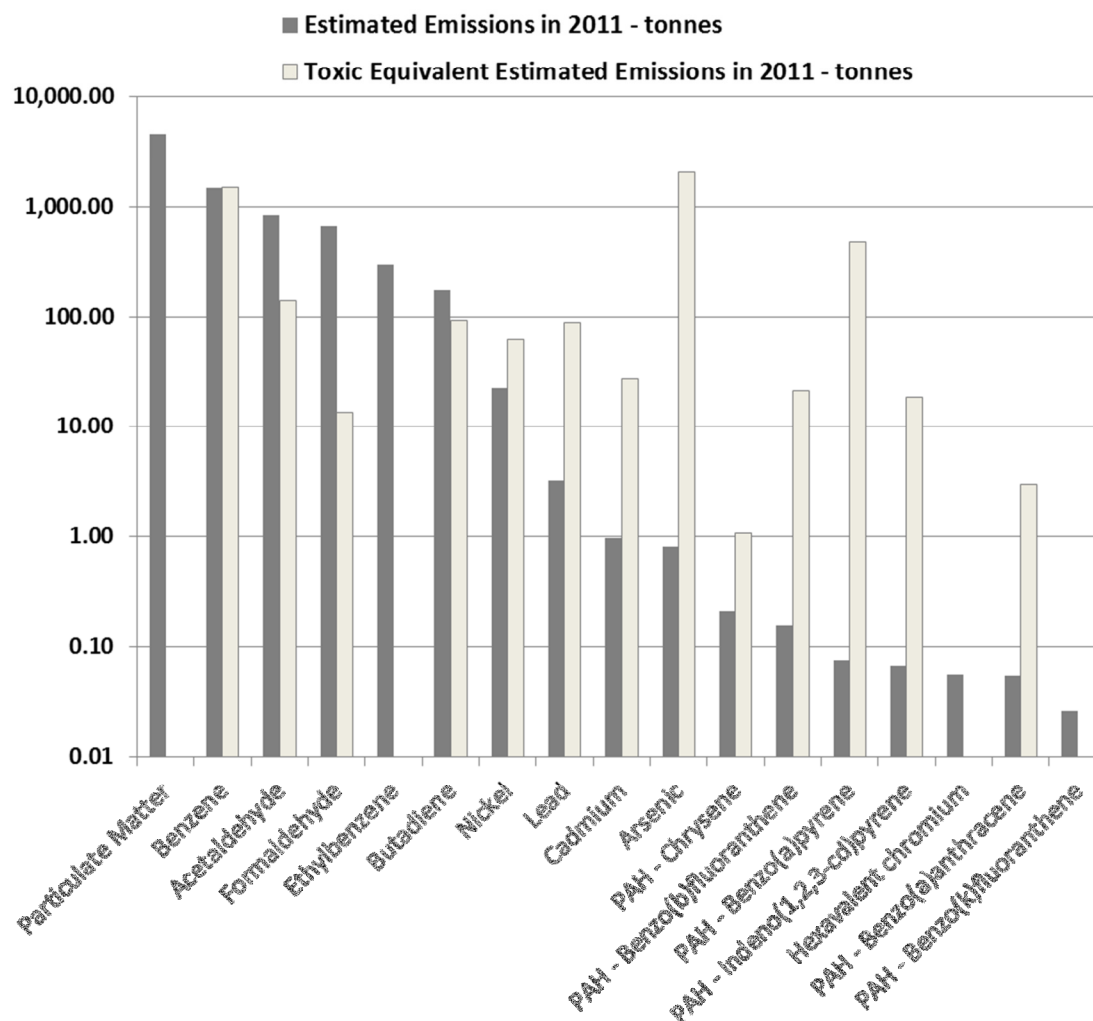
- **Arsenic, nickel and hexavalent chromium.** These are all heavy metals and occur naturally, but pollution sources are mainly metal mining and refining processes and burning fossil fuels (especially coal) and garbage. All are known carcinogens (nickel only when inhaled).

In addition, the CAREX EMP includes only large commercial and industrial sources, transportation and residential heating with oil, natural gas, or wood. Figure 1.7 shows the estimated amounts emitted for Manitoba by these sources in 2011.

In terms of total estimated emissions from these specific sources, the largest are of PM<sub>2.5</sub>, followed by benzene, acetaldehyde, formaldehyde, ethylbenzene and 1,3-butadiene, all of which are VOCs. The metals nickel, lead, cadmium, and arsenic are next. All of the remaining substances are PAHs, with the exception of hexavalent chromium (third last).

<sup>4</sup> Canada-Wide Standard for Mercury Emissions (Incinerating and Base Metal Smelting) 2010 Progress report  
[http://www.ccme.ca/files/Resources/air/mercury/mercury\\_incin\\_bms\\_2010\\_progress\\_rpt\\_e.pdf](http://www.ccme.ca/files/Resources/air/mercury/mercury_incin_bms_2010_progress_rpt_e.pdf)

**Figure 1.7 Emissions Mapping Project Estimates of Emissions of Known and Suspected Carcinogens in Manitoba – 2011**



An important feature of the EMP estimates is the reporting of toxic equivalent amounts. These are the total annual amounts of emissions adjusted by their toxicity compared to benzene (Figure 1.7). Emissions that are more toxic are increased, and emissions that are less toxic are decreased. Although we don't have toxicity factors for all substances, it still helps to highlight some of the substances that are emitted in relatively small amounts, but that may be of more concern due to their potential for increasing the risk of getting cancer. For example, in the Figure above, the estimated 806 kg of arsenic emitted is equivalent to emitting 2,094 tonnes of benzene in terms of cancer risk. Looking at the toxic equivalents, the highest amounts are: arsenic (2,094 tonnes), benzene (1,509 tonnes), benzo[a]pyrene (480 tonnes), 1,3-butdiene (94 tonnes), lead (90 tonnes), nickel (62 tonnes) and cadmium (27 tonnes).



**NOTE:** There is no toxicity factor for PM<sub>2.5</sub>. In general, most of the other substances listed are contained within PM<sub>2.5</sub> as tiny solid or gas particles. The amount of each substance within PM<sub>2.5</sub> can vary a lot at any given place and over time, as different sources may be contributing. Without knowing exactly how much of each substance is contained within the PM<sub>2.5</sub> at a particular location and time, it is not possible to estimate the toxic equivalent emissions.

The CAREX Canada estimates are lower than the Environment Canada estimates for the same substances for several reasons:

- VOCs – the Environment Canada estimate of 91,950 tonnes includes **all** VOCs. The Emissions Mapping Project includes estimates only for a few specific VOCs that are known or suspected carcinogens - benzene, acetaldehyde, formaldehyde, ethylbenzene, and 1,3-butadiene. These total approximately 3,500 tonnes. In addition, the Emissions Mapping Project does not include as many small sources.
- PM<sub>2.5</sub> – open sources are estimated by Environment Canada to contribute 51,760 tonnes (86 percent) of PM<sub>2.5</sub> in Manitoba, with the remaining sources contributing 8,400 tonnes. The Emissions Mapping Project estimate is 4,585 tonnes, as it does not include open sources, or as many small sources in other categories.
- Lead – the Environment Canada estimate of 4,600 kg includes more small sources and is higher than the 3,222 tonnes estimated by the Emissions Mapping Project.
- PAHs – The Environment Canada estimate of 1,920 kg includes all PAHs and more small sources, compared to the Emissions Mapping Project estimates for only a few specific PAHs known or suspected to cause cancer – benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, and indeno[1,2,3-cd]pyrene. These total 591 kgs.
- Cadmium - the Environment Canada estimate of 1,660 kg includes more small sources and is higher than the 966 kg estimated by the Emissions Mapping Project.

## 2. AGRICULTURE

**Agricultural emissions.** The emissions inventories produced by Environment Canada (See Emissions Inventories section) show that open sources are the largest contributors of PM<sub>2.5</sub>, hexachlorobenzene, mercury, and dioxin/furan in Manitoba. Agricultural activities are included in the 'open source' category. Estimates for 2013 show that agriculture in Manitoba contributes a similar amount of PM<sub>2.5</sub> compared to industrial, non-industrial and mobile sources; it is the second largest source of VOCs; and emissions of lead, cadmium, mercury, dioxin/furans, hexachlorobenzene and PAHs are very low to non-existent from the agricultural sector (Table 2.1).

**Table 2.1. Contribution of Agricultural Sources of Selected Known and Suspected Carcinogens compared other sources – Manitoba - 2013<sup>5</sup>**

SOURCES	PM <sub>2.5</sub> (tonnes)	VOCs (tonnes)	Lead (kg)	Cadmium (kg)	Mercury (kg)	D/F* (gTEQ)	HCB (g)	PAHs (kg)
OPEN AGRICULTURAL SOURCES:								
Animals	2,960	24,319						
Tilling & Wind Erosion	2,349							
Fertilizer Application	315							
Farm Fuel Combustion	2	2	0.06	4	0.006	0.001		0
OTHER OPEN SOURCES:								
Construction Operation	15,538	2	0.6	1	0.2	0		0
Dust from Paved Roads	9,724							
Dust from Unpaved Roads	20,427							
Dust from Coal Mining	6							
Waste	139	699			17	1	274	40
Mine Tailings	49							
Prescribed Burning								
POINT AND MOBILE SOURCES:								
INDUSTRIAL	2,146	18,502	2,440	1,618	20	0.3	288	0.5
NON-INDUSTRIAL	3,127	4,165	57	31	5.3	0.131	24	1,808
MOBILE	3,045	27,686	2,097	8	7	0.6		71
INCINERATION	0	7	3	0.04	9	0.1		
MISCELLANEOUS	354	16,563	0.05	0.1	12	0		0.1
<b>GRAND TOTAL</b>	<b>60,181</b>	<b>91,944</b>	<b>4,598</b>	<b>1,661</b>	<b>70</b>	<b>2</b>	<b>585</b>	<b>1,919</b>

\*Dioxins/Furans

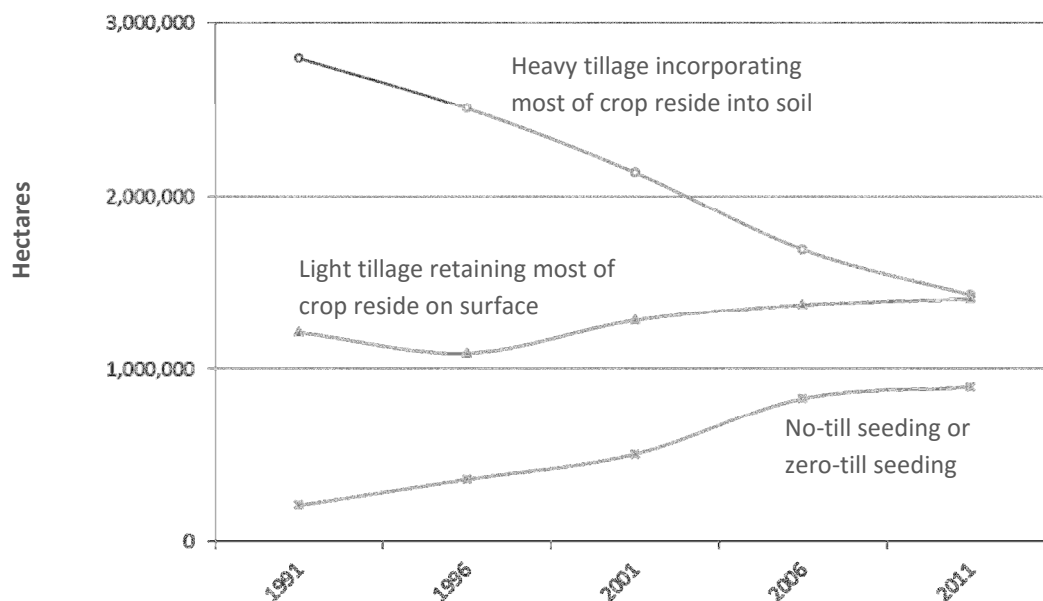
<sup>5</sup> [http://ec.gc.ca/inrp-npri/donnees-data/ap/index.cfm?do=ap\\_result&process=true&sector=&lang=en&year=2013&substance=all&location=MB&submit=Submit&div=0](http://ec.gc.ca/inrp-npri/donnees-data/ap/index.cfm?do=ap_result&process=true&sector=&lang=en&year=2013&substance=all&location=MB&submit=Submit&div=0)

Agricultural activities contributed about 25 percent of the total VOC emissions in Manitoba in 2013. VOCs from agriculture arise primarily from the breakdown of manure (in pots, lagoons or spread on fields) and silage<sup>6</sup>. The main concern about the VOCs from these sources, unlike VOCs from burning fossil fuels or industrial processes, is their contribution to odor problems rather than long-term health effects like cancer.

The PM<sub>2.5</sub> from agriculture accounts for about 10 percent of the total amount emitted by all sources in Manitoba in 2013. It is mostly made up of tiny dust particles that become airborne from animal movement, tilling, and wind erosion. Current thinking among health researchers is that PM<sub>2.5</sub> made up of soil dust is not related to cancer risk – it is PM<sub>2.5</sub> from burning fossil fuels and other organic matter that is most hazardous.<sup>7</sup>

Emissions of PM<sub>2.5</sub> from agriculture are declining in Manitoba<sup>8</sup> due in part to changing field preparation practices (Figure 2.1). The area of farmland tilled heavily to break up and bury crop residue after harvest and to control weeds has declined significantly - from 2.8 million hectares in 1991 to 1.4 million hectares in 2011. The area of farmland prepared using lighter tilling methods or no-till methods has increased from a total of 1.4 million hectares in 1991 to 2.3 million hectares in 2011. These methods create less soil disturbance, so they help reduce soil loss from wind erosion and therefore reduce PM<sub>2.5</sub>.

**Figure 2.1. Changes in field preparation practices in Manitoba – 1991 to 2011<sup>9</sup>**



<sup>6</sup> Bittman S., Masse D.I., Pattey E., et al. Chapter 11: Effects of Agriculture on Air Quality in Canada in Air Quality Management. (2014). Eds. E. Taylor and A. McMillan. Springer Science+Business Media. Dordrecht, Germany.

<sup>7</sup> Laden F, Neas LM, Dockery DW, Schwartz J. Association of fine particulate matter from different sources with daily mortality in six U.S. cities. *Environmental Health Perspectives*. 2000;108(10):941-947.

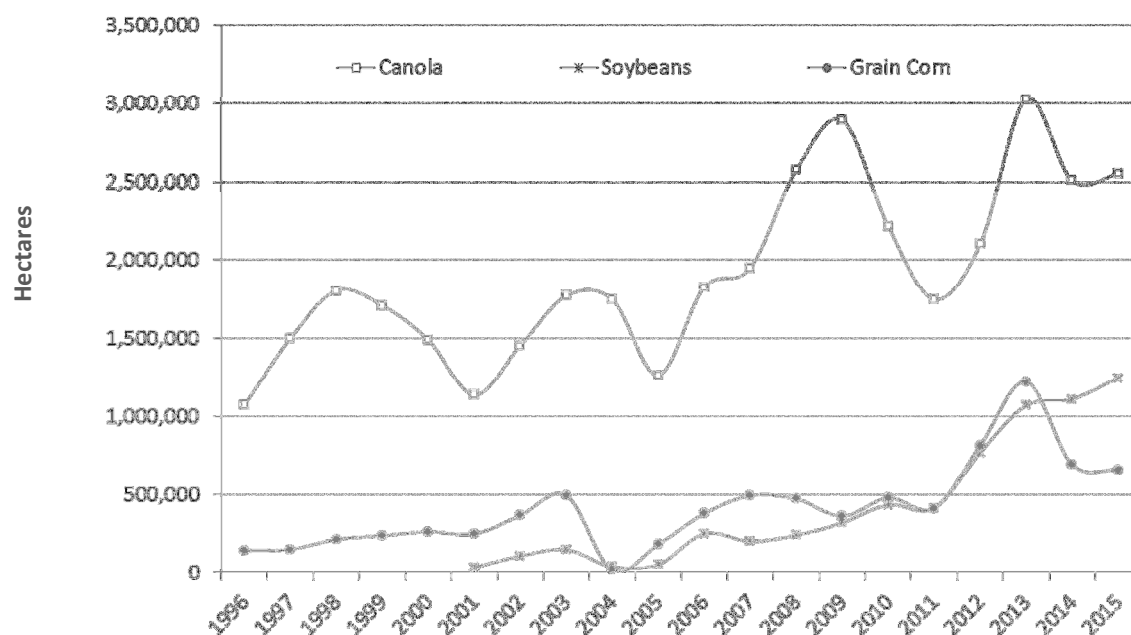
<sup>8</sup> Patter E., Qiu G. Trends in primary particulate matter emissions from Canadian agriculture. *Journal of the Air and Waste Management Association*. 2012; 62(7):737-747.

<sup>9</sup> Source data: Statistics Canada. Table 004-0010 - Census of Agriculture, selected land management practices and tillage practices used to prepare land for seeding, Canada and provinces, every 5 years.

**Agricultural pesticides.** One reason field preparation methods have changed is the introduction of crops genetically modified to resist the effects of specific herbicides. These crops are not damaged by the herbicide, so fields can simply be sprayed instead of tilled to control weeds.

Since 1995, genetically modified (GM) canola, soybean and grain corn crops have been grown in Canada. In Manitoba, the number of hectares planted with these crops has been rising (Figure 2.2)<sup>10</sup>. By 2006, it was estimated from crop insurance data that 93 percent of canola crops and 89 percent of soybean crops grown in Manitoba were GM types<sup>11</sup>. Data from other provinces suggest that as much as 85 percent of grain corn crops are GM<sup>12</sup>.

**Figure 2.2. Hectares planted with canola, soybeans and grain corn in Manitoba 1996 - 2015**



The actual amounts of different pesticides (herbicides, insecticides, fungicides and anti-microbials) used for agricultural purposes in Manitoba are not available; however, the Health Canada Pest Control Product Sales Report for 2012<sup>13</sup> shows that the quantity of pesticides sold in Canada is increasing in the agricultural sector, decreasing in the non-agricultural sector, and staying about the same on the domestic sector (Figure 2.3). The agricultural sector accounts for 78 percent of sales, while the non-agricultural sector (mostly wood preservation, water treatment, and weed control in forestry) accounted for 17 percent of sales and the domestic sector (lawn care and insect control) accounted for 5 percent of total sales.

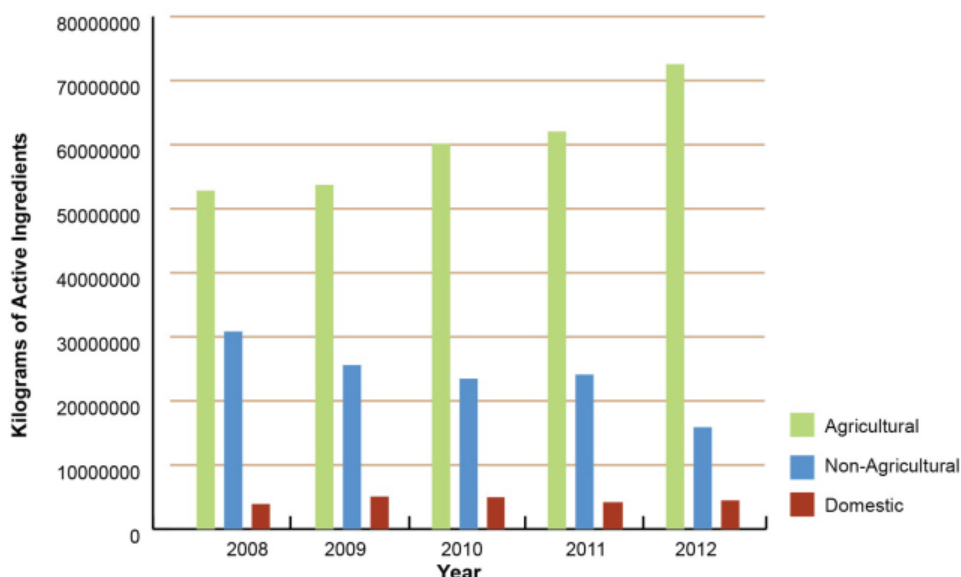
<sup>10</sup> Statistics Canada. Table 001-0010 - Estimated areas, yield, production and average farm price of principal field crops, in metric units, annual

<sup>11</sup> Wilson, J. 2012. Doctoral Thesis: Agricultural pesticide use trends in Manitoba and 2,4-D fate in soil. Department of Soil Science, University of Winnipeg.

<sup>12</sup> <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=0010072>

<sup>13</sup> [http://www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/reporting-declaration/\\_sales-ventes/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/reporting-declaration/_sales-ventes/index-eng.php)

**Figure 2.3. Quantity of pesticides sold in Canada by sector (2008 – 2012)<sup>14</sup>**



The top ten most frequently used agricultural pesticides in Canada in 2012 are listed in Table 2.2.<sup>15</sup> By far the most-used is the herbicide glyphosate, with more than 25 million kg sold in Canada in 2012. It can be used on many crops, including GM canola, corn and soybean crops, and is classified as a probable human carcinogen. In second place with more than 1 million kg sold is 2,4-D, another herbicide that is widely used and can be applied to GM corn and soybean crops. It is classified as a possible human carcinogen. Another possible carcinogen, chlorothalonil, is on the list and ranks 11<sup>th</sup> in overall sales for Canada. It is used to control leaf fungus on many kinds of crops, including: asparagus, blueberry, carrot, celery, chickpea, dry pea, lentil, onion, parsnip, potato, strawberry, stone fruits, sweet corn, tomato and wheat.<sup>16</sup>

In March 2015, the International Agency for Research on Cancer identified glyphosate as a probable carcinogen.<sup>17</sup> The decision was based partly on studies of farm workers in Canada, the US, and Sweden that suggested exposure to glyphosate is linked to an increased risk of non-Hodgkin lymphoma. Only one of these studies accounted for uses of other kinds of pesticides and showed a statistically significant increase (between 1.1 and 4 times higher risk) when comparing farmers with exposure to glyphosate to

<sup>14</sup> [http://www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/reporting-declaration/\\_sales-ventes/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/reporting-declaration/_sales-ventes/index-eng.php)

<sup>15</sup> Sales data from [http://www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/reporting-declaration/\\_sales-ventes/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/reporting-declaration/_sales-ventes/index-eng.php); GM crop information from <http://www.inspection.gc.ca/active/eng/plaveg/bio/pntvcne.asp>.

<sup>16</sup> Health Canada 2011. Proposed Re-evaluation Decision Chlorothalonil. [http://publications.gc.ca/collections/collection\\_2012/sc-hc/H113-27-2011-14-eng.pdf](http://publications.gc.ca/collections/collection_2012/sc-hc/H113-27-2011-14-eng.pdf)

<sup>17</sup> International Agency for Research on Cancer. (2015). Some Organophosphate Insecticides and Herbicides: Diazinon, Glyphosate, Malathion, Parathion, and Tetrachlorvinphos. Volume 112. World Health Organization.

farmers with no exposure to glyphosate.<sup>18</sup> Importantly, the studies looked at exposure to pesticides that contain glyphosate along with other chemicals, so it is difficult to prove that glyphosate by itself is responsible for the increased cancer risk.

**Table 2.2. Most frequently used pesticides for agriculture in Canada - 2012**

National sales rank	Herbicide	Use	Herbicide resistant GM crops available			IARC*	Amount sold in 2012 (kg)
			Canola	Corn	Soybean		
1	<b>Glyphosate</b>	Herbicide	x	x	x	<b>2A</b>	> 25,000,000
3	<b>2,4-D</b>	Herbicide		x	x	<b>2B</b>	> 1,000,000
4	Glufosinate ammonium	Herbicide	x	x	x		> 1,000,000
5	MCPA	Herbicide					>1,000,000
6	Mineral oil (agricultural)	Insecticide					>1,000,000
7	Surfactant blend	Other					>1,000,000
8	Corn gluten meal	Herbicide					>1,000,000
9	Mancozeb	Fungicide					>1,000,000
11	<b>Chlorothalonil</b>	Fungicide				<b>2B</b>	>1,000,000
14	Bromoxynil	Herbicide					>500,000

\* International Agency for Research on Cancer (IARC) classifies known carcinogens as 1, probable carcinogens as 2A, and possible carcinogens as 2B.

In June 2015, the International Agency for Research on Cancer classified the herbicide 2,4-D as a possible carcinogen.<sup>19</sup> Although their panel of 26 experts from 13 countries found inadequate evidence that 2,4-D is linked to cancer in humans (some thought there was weak evidence), they found weak evidence in lab animals, and strong evidence that 2,4-D can produce oxidative stress in humans and moderate evidence that it causes immunosuppression.

Chlorothalonil was first classified as a possible carcinogen by the International Agency for Research on Cancer in 1999, based on observations of kidney and forestomach tumours in mice and rats.<sup>20</sup>

In Canada, the Pesticide Management Regulatory Agency (PMRA) conducts health risk assessments prior to registering a pesticide for use in Canada. Even though increased cancer risks may be shown for some pesticides, the PMRA assesses the level of exposure likely to be encountered by humans, animals and other living organisms when used according to the label instructions. If the levels of exposure fall below regulatory thresholds or levels of concern, the PMRA registers the pesticide for use in Canada. Currently glyphosate, 2,4-D and chlorothalonil are all registered for use in Canada. The PMRA decisions can be controversial – those opposing pesticide uses point out some of the weaknesses of this system:

<sup>18</sup> De Roos, AJua, et al. "Integrative assessment of multiple pesticides as risk factors for non-Hodgkin's lymphoma among men." *Occupational and Environmental Medicine* 60.9 (2003): e11-e11.

<sup>19</sup> Loomis, Dana, et al. "Carcinogenicity of lindane, DDT, and 2, 4-dichlorophenoxyacetic acid." *The Lancet Oncology* 16.8 (2015): 891-892.

<sup>20</sup> <http://monographs.iarc.fr/ENG/Monographs/vol73/index.php>

- there are often few real world studies available of either humans or animals, for either short-term or long-term periods to fully understand the possible health effects;
- many of the studies provided as evidence to establish safe levels are conducted using lab animals by the product manufacturers;
- there is often a lack of data on measured levels of pesticides in the environment, making it difficult to know the true range of levels that might be encountered; and
- each pesticide is evaluated by itself, so there is no consideration of the cumulative effects that exposure to many chemicals at the same time might cause.

In general, all experts would agree that people whose work involves handling and applying pesticides are the most likely to have potentially harmful exposures. Appropriate precautions should be taken to limit exposure when working with any pesticide.

Another consideration is the increasing spread of herbicide-resistant weeds due to the over-use of single herbicides throughout the growing season or over several years. Each time a specific herbicide is applied, a few weeds that are naturally more resistant survive. With each following application, resistant weeds get stronger and stronger, until the herbicide is no longer as effective. Manitoba Agriculture, Food and Rural Development has the following information on their website:

### **Glyphosate Resistant (GR) Kochia Confirmed in Manitoba<sup>21</sup>**

Manitoba Agriculture, Food and Rural Development (MAFRD) jointly conducted a kochia survey across Manitoba in the fall of 2013 in with Agriculture and Agri-Food Canada (Saskatoon Research Centre) and the University of Manitoba, funded by the Western Grains Research Foundation and BASF Canada.

Plants from 283 different kochia populations were harvested, thrashed and planted over the winter. The resulting seedlings were tested for glyphosate resistance. Kochia plants from two of the 283 sites were found to be glyphosate resistant (GR). Both sites were in the Red River Valley. Finding GR kochia was not unexpected as previous surveys in Alberta and Saskatchewan, North Dakota, South Dakota and Minnesota, have all identified GR kochia.

Herbicide resistant weeds are not a new issue in Manitoba, as Group 2 resistant kochia and Group 3 resistant green foxtail populations were identified in 1988. However, resistance to glyphosate is new and it remains an important herbicide in Manitoba crop production systems.

If GR kochia populations become more common in the province, it will result in added management skills and expense for Manitoba farmers. In-crop control of GR kochia can be difficult in broadleaf crops like canola, soybean or pulses and pre-seed or pre-emergent treatments may be necessary for adequate control.

As GR kochia has been found in less than one per cent of the sites sampled, Manitoba farmers have an opportunity to minimize the spread of this weed. Farmers should consider reducing the number of glyphosate applications in a single season and incorporate non-glyphosate herbicides in weed management programs when growing glyphosate-tolerant crops. Farmers will also need to incorporate non-herbicidal measures like crop rotation, tillage and manual weeding if necessary to control populations.

---

<sup>21</sup> <http://www.gov.mb.ca/agriculture/crops/weeds/glyphosate-resistant-kochia.html>

Currently, herbicide resistant weeds are more problematic in other provinces; however, limiting the spread of these kinds of weeds in Manitoba may mean the use of different kinds of herbicides in the future, some of which may have the potential to impact ecosystems and human health.

First Nations communities located in census areas where a high percentage of the land is treated with pesticides MAY be more at risk of exposure; however, without measured data on pesticide levels in the air, water and food for each community, it is not possible to assess the actual level of risk, if any. Figure 2.4 shows the percentage of each census area that is treated with herbicides in Manitoba, as per the 2011 Statistics Canada Census of Agriculture. Table 2.3 lists the percentage of land treated with herbicides, insecticides and fungicides for all census areas in which First Nations communities are located.

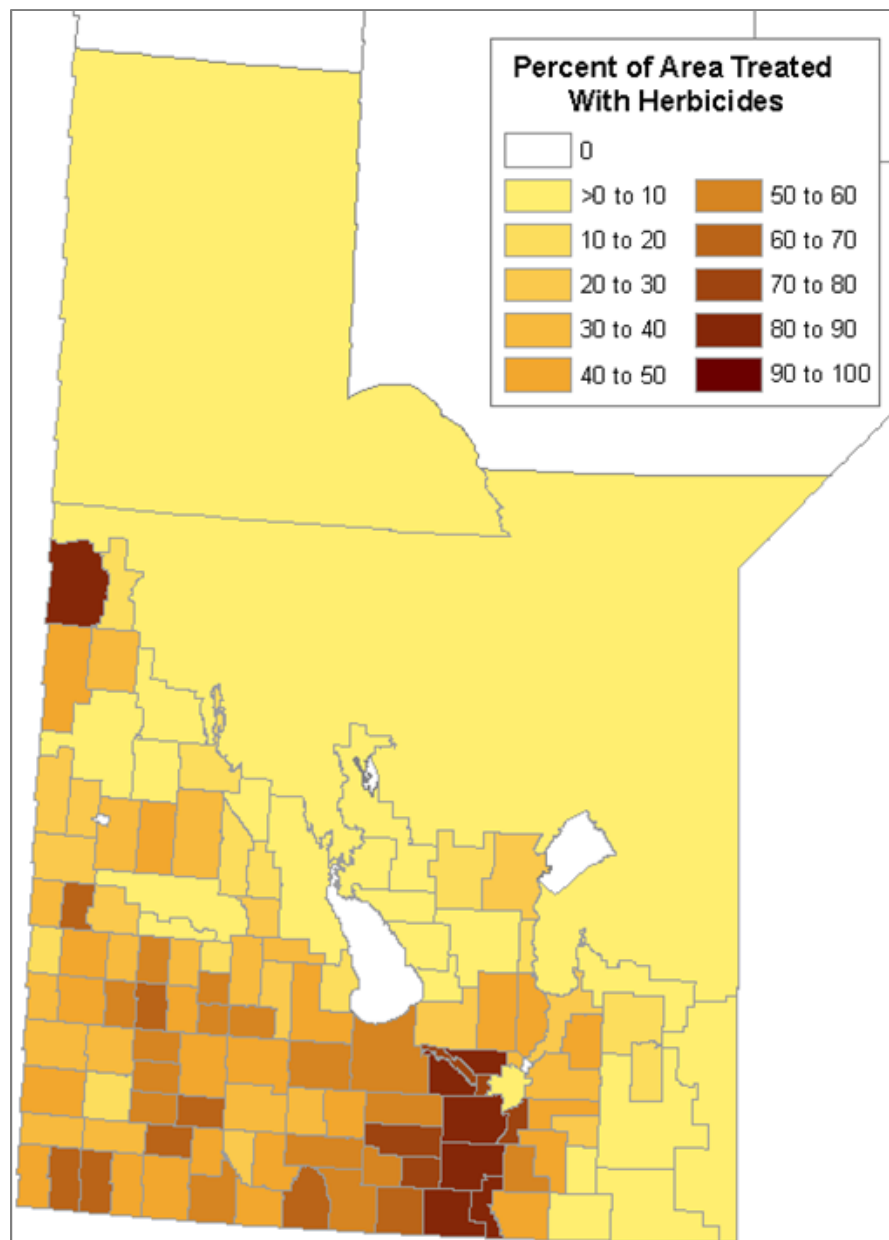
An analysis of health risks due to pesticides for the nine First Nations communities that participated in the First Nations Food, Nutrition and the Environment Study (FNFNES) for Manitoba<sup>22</sup> is included in the Environment Pollutants – Monitoring report. The FNFNES focused on persistent organic pesticides that are no longer used in Canada, but are sometimes still detected in foods since they remain in the environment for long periods of time and tend to build up in fatty tissues of fish and animals. The FNFNES also included six organochlorine pesticides which are in use currently, but did not detect any of these pesticides in the foods tested. The FNFNES did not include any of the pesticides most frequently use in Manitoba (listed in Table 2.2).

---

<sup>22</sup> Swan Lake First Nation, Sandy Bay Ojibway First Nation, Pine Creek First Nation, Chemawawin Cree Nation, Sagkeeng First Nation, Hollow Water First Nation, Cross Lake Band, Sayisi Dene First Nation, and Northlands Denesuline First Nation.



Figure 2.4 Percent of Census Areas treated with herbicides in Manitoba - 2011



**Table 2.3. Hectares and percent of Census Area treated with pesticides in Manitoba - 2011<sup>23</sup>**

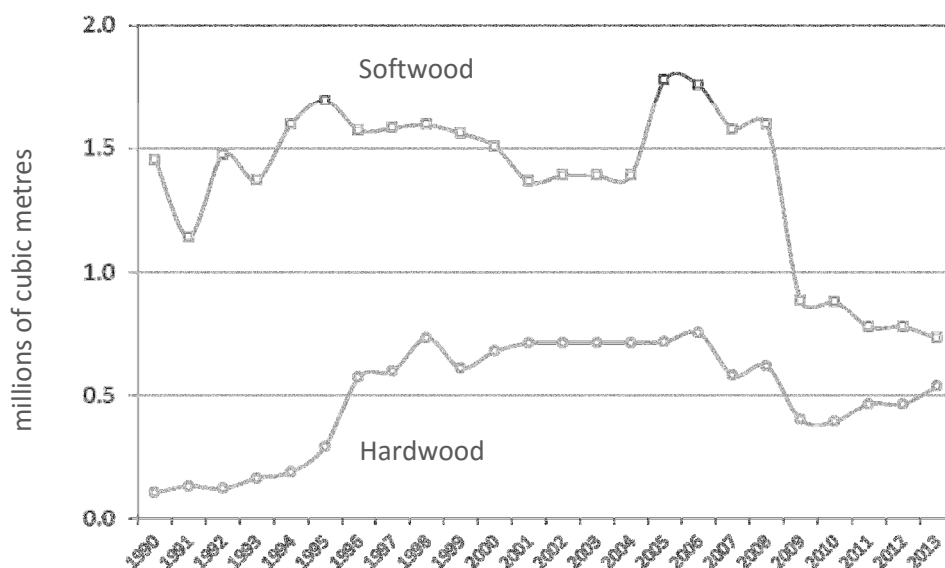
First Nations within Census Area	Census Area	Total Hectares	Hectares (Total and Percent) Treated with Pesticides		
			Herbicides	Insecticides	Fungicides
Dakota Plains Dakota Tipi Long Plain	Portage la Prairie	210,178	110,514 (53%)	21,452 (10%)	66,543 (32%)
Swan Lake	Lorne	97,320	55,819 (57%)	8,948 (9%)	40,313 (41%)
Roseau River Anishinabe	Franklin	98,566	42,617 (43%)	6,622 (7%)	21,395 (22%)
Tootinaowaziibeeng	Grandview	115,116	36,593 (32%)	2,780 (2%)	14,100 (12%)
Birdtail Sioux	Miniota	85,973	34,664 (40%)	2,893 (3%)	17,557 (20%)
Sioux Valley Dakota Nation	Woodworth	86,808	32,191 (37%)	3,628 (4%)	11,332 (13%)
Keeseekoowenin	Strathclair	57,405	31,307 (55%)	4,032 (7%)	16,396 (29%)
Canupawakpa Dakota FN	Cameron	77,334	28,999 (37%)	4,207 (5%)	12,307 (16%)
Brokenhead Ojibway Nation	St. Clements	85,105	23,874 (28%)	3,583 (4%)	8,553 (10%)
Gamblers	Russell	57,623	22,534 (39%)	4,728 (8%)	9,010 (16%)
Ebb and Flow	Alonsa	314,297	21,278 (7%)	4,499 (1%)	7,430 (2%)
Waywayseecappo FN	Rosburn	80,079	20,549 (26%)	2,199 (3%)	6,761 (8%)
Rolling River	Harrison	57,438	19,632 (34%)	3,518 (6%)	9,458 (16%)
Chemawawin Cree Nation Grand Rapids First Nation Mosakahiken Cree Nation Opaskwayak Cree Nation	Division No. 21, Unorganized	5,940,330	19,560 (<1%)	2,996 (0%)	6,360 (<1%)
Sandy Bay	Lakeview	68,547	10,728 (16%)	2,036 (3%)	2,541 (4%)
Little Saskatchewan	Grahamdale	247,400	7,544 (3%)	1,747 (1%)	2,401 (1%)
Pinaymootang First Nation	--	--	--	--	--
Berens River Bloodvein Dauphin River Fisher River Fort Alexander Hollow Water Kinonjeoshtegon First Nation Lake St. Martin					
Little Black River Little Grand Rapids O-Chi-Chak-Ko-Sipi FN Pauingassi First Nation Peguis Pine Creek Poplar River First Nation Sapotaweyak Cree Nation Skownan First Nation Wuskwi Sipiik First Nation	Division No. 19, Unorganized	8,434,592	6,741 (<1%)	1,509 (<1%)	2,379 (<1%)
Lake Manitoba	Eriksdale	84,490	3,990 (5%)	0 (0%)	2,238 (3%)
Buffalo Point First Nation	Division No. 1, Unorganized	481,178	270 (<1%)	0 (0%)	0 (0%)

<sup>23</sup> Statistics Canada Agriculture Census 2011.

### 3. FORESTRY

In 2013, revenues from forestry activities on provincial Crown lands in Manitoba reached almost \$4.4 million, and a total of 1.27 million cubic metres of soft and hardwoods were produced.<sup>24</sup> In general, hardwood production has increased since 1990, but overall production is lower due to larger decreases in softwood production (Figure 3.1).<sup>25</sup>

**Figure 3.1. Softwood and hardwood production in Manitoba – 1990 to 2013**

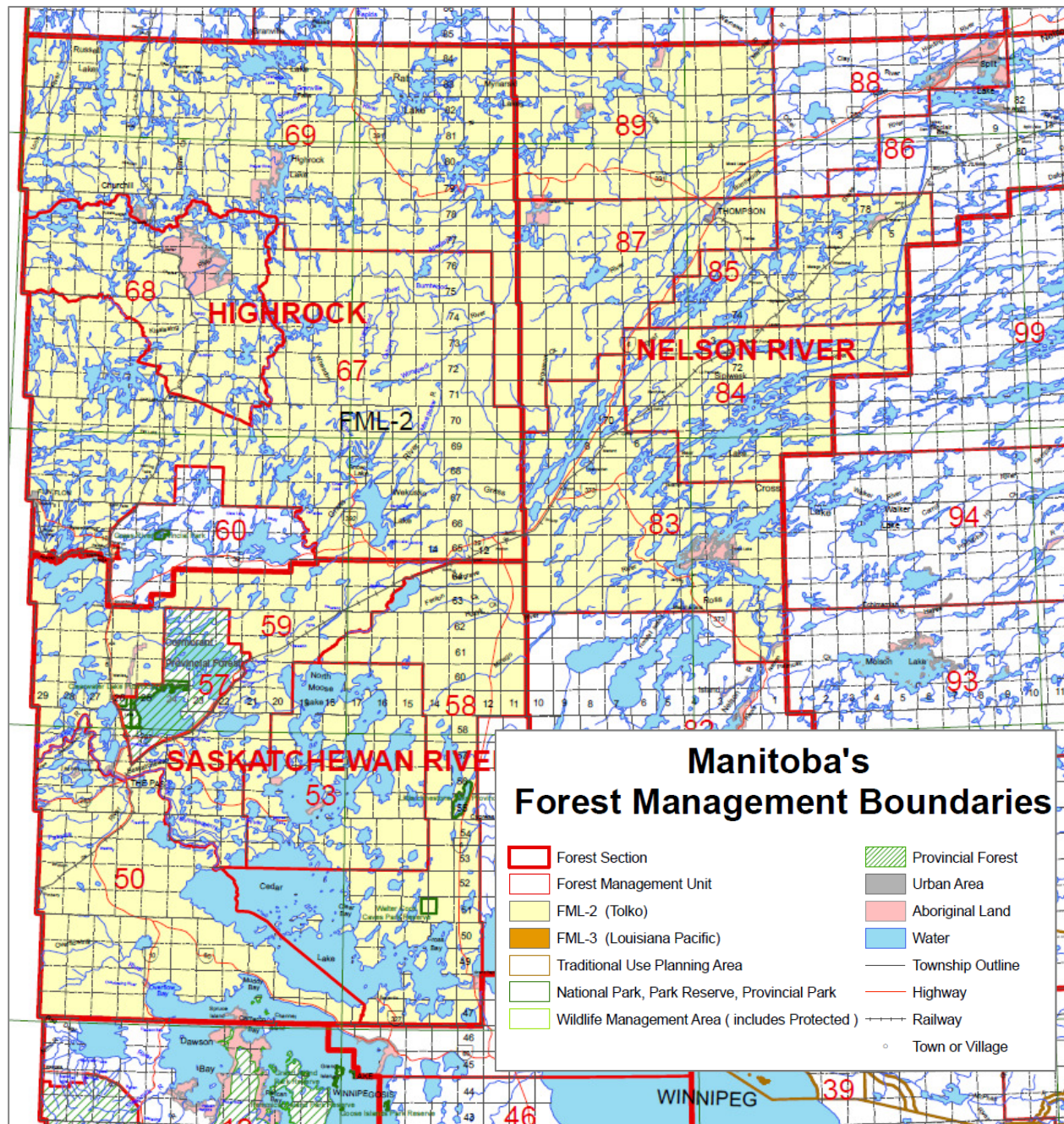


There are currently two forest companies operating in Manitoba: Tolko Industries Ltd. in The Pas and Louisiana Pacific located on the west side of Lake Manitoba and in the Duck Mountain area. The Pine Falls paper mill, in operation since the 1920s and most recently owned by Tembec, permanently closed in September 2009.

Tolko Industries Ltd. operates two divisions in The Pas – Kraft Papers and Solid Wood. The Kraft Papers Division produces unbleached sack kraft paper which is used to make multi-layer paper bags typically used for cement, chemicals, and foods like flour and sugar. The mill has been in operation since 1971, but was acquired by Tolko in 1997. The Solid Wood Division operates a sawmill, capable of producing kiln-dried spruce, pine and fir studs and random length lumber. The sawmill is currently on indefinite closure, but wood chips are still produced on site. Both the Kraft Papers Division and the Solid Wood Division (when in operation) are supplied with softwood from the wooded lands within Tolko's Forest Management License area (Figure 3.2). Pollution emissions from both facilities are reported to the National Pollutant Release Inventory (see next section).

<sup>24</sup> [http://nfdp.ccfm.org/revenues/quick\\_facts\\_e.php](http://nfdp.ccfm.org/revenues/quick_facts_e.php)

<sup>25</sup> [http://nfdp.ccfm.org/data/compendium/html/comp\\_52e.html](http://nfdp.ccfm.org/data/compendium/html/comp_52e.html)

Figure 3.2. Tolko Industries Ltd. Forest Management Licence (FML) #2 Map <sup>26</sup>

## FIRST NATIONS WITHIN TOLKO FOREST MANAGEMENT LICENSE AREA:

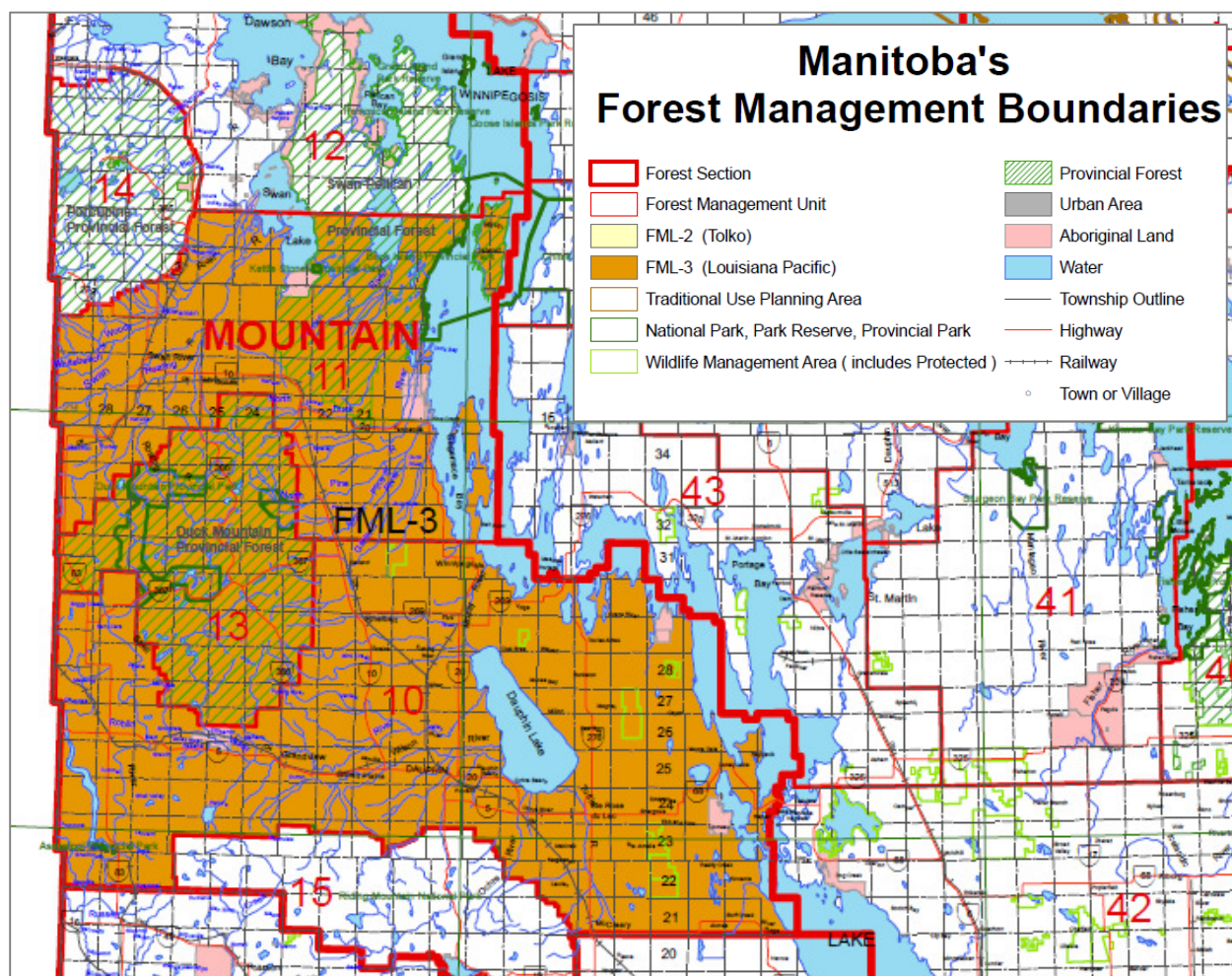
- Chemawawin Cree Nation
- Grand Rapids First Nation
- Mosakahiken Cree Nation
- Opaskwayak Cree Nation
- Cross Lake First Nation
- Nisichawayasihk Cree Nation
- Marcel Colomb First Nation
- Mathias Colomb

<sup>26</sup> [http://www.gov.mb.ca/conservation/forestry/manage/fml\\_2.html](http://www.gov.mb.ca/conservation/forestry/manage/fml_2.html)



Louisiana-Pacific Canada (LP) has owned and operated the Swan Valley Oriented Strand Board (OSB) Plant near Minitonas since 1996, and is supplied with wood from the Forest Management Licence #3 area (Figure 3.3). OSB is an alternative to plywood and is widely used for residential and commercial construction for walls, floors and roofs. The Plant is now in the process of being converted to producing panel and lap siding in addition to OSB panels.<sup>27</sup> Pollution emissions from this facility are reported to the National Pollutant Release Inventory (see next section).

**Figure 3.3. Louisiana Pacific Canada Inc. Forest Management Licence (FML) #3 Map**<sup>28</sup>



FIRST NATIONS WITHIN LOUISIANA PACIFIC FOREST MANAGEMENT LICENSE AREA:

- Ebb and Flow
- Tootinaowaziibeeng Treaty Reserve
- Wuskwi Sipiik First Nation
- O-Chi-Chak-Ko-Sipi First Nation
- Pine Creek

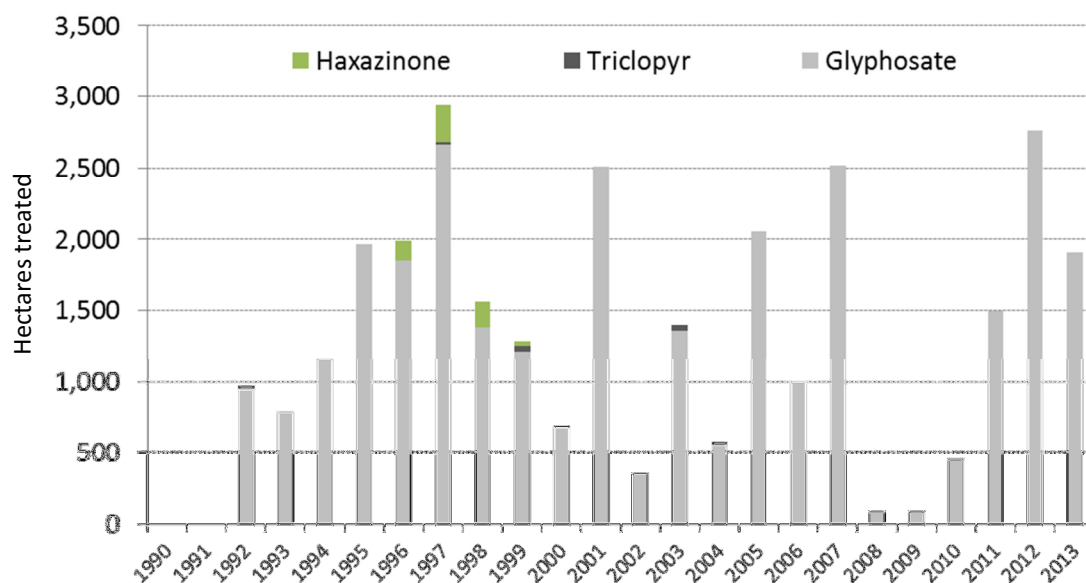
<sup>27</sup> <http://www.winnipegson.com/2015/05/06/lp-corp-to-spend-95-million-on-manitoba-facility>

<sup>28</sup> [http://www.gov.mb.ca/conservation/forestry/manage/fml\\_3.html](http://www.gov.mb.ca/conservation/forestry/manage/fml_3.html)

Tembec's Pine Falls operation first opened in 1927, immediately upstream of the Sakgeeng First Nation reserve. Over the years, through various owners, the mill was upgraded with new technologies. As of 2007, Tembec was licensed to manufacture newsprint, and operate a pulp and paper mill, a de-inking plant, and a wastewater treatment facility. The entire operation closed permanently in 2009. Emissions from this facility were reported to the National Pollutant Release Inventory between 2000 and 2009, with the exception of chlorine, which was reported as being emitted between 1994 and 1998. The NPRI does not hold records for emissions prior to this time.

In addition to emissions from mills and plants for manufacturing wood products, activities associated with forestry operations produce or use potentially harmful substances. Open burning of woody debris releases fine particulates ( $PM_{2.5}$ ), a known human carcinogen. Pesticides are also used to help regenerate areas after clear cutting. The National Forestry Database reports that in Manitoba, open burning has not been used for forestry purposes for many years<sup>29</sup> and only the herbicides glyphosate, and very small amounts of haxazinone and triclopyr, have been used since 1990 (Figure 3.4)<sup>30</sup>. No use of MSMA, 2,4-D, simazine, amitrol, or picloram was reported between 1990 and 2013.

**Figure 3.4. Area treated with herbicides for forestry purposes in Manitoba – 1990 to 2013**



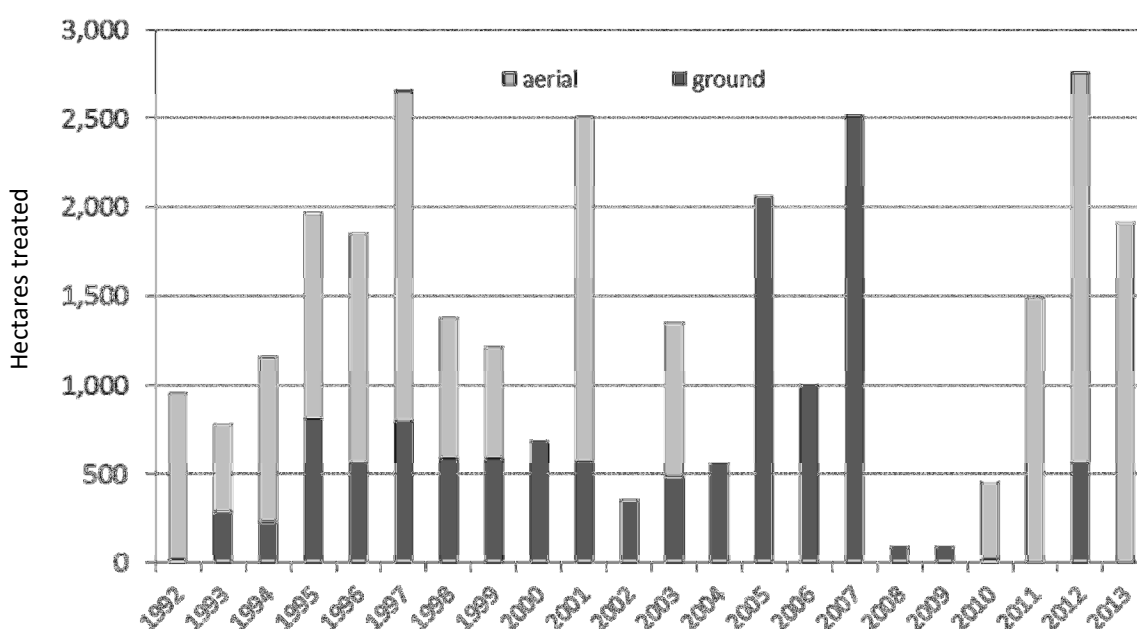
<sup>29</sup> Not including burning used to reduce fire hazards

<sup>30</sup> [http://nfdp.ccfm.org/data/detailed/html/detailed\\_6110\\_p\\_MB.html](http://nfdp.ccfm.org/data/detailed/html/detailed_6110_p_MB.html)

Glyphosate is classified as a probable carcinogen by the International Agency for Research on Cancer (IARC).<sup>31</sup> The people most at risk are those who work as pesticide applicators for long periods of time (see Agriculture section for a discussion of the association between glyphosate and non-Hodgkin lymphoma in farmers).<sup>32</sup>

Glyphosate is applied either by aerial or ground spraying (Figure 3.5).<sup>33</sup> Animals, insects and other organisms can be exposed to glyphosate if they are present when clearcuts are being sprayed. Some may also be exposed when they eat or land on sprayed plants, or eat insects that have been sprayed. Because glyphosate can be unintentionally sprayed onto nearby streams or lakes, or transported there by wind and runoff, aquatic animals, plants and other organisms can be exposed as well.

**Figure 3.5. Glyphosate application methods in Manitoba – 1992 to 2013**



In Canada, the Pesticide Management Regulatory Agency (PMRA) recently re-evaluated the safety of glyphosate for aquatic plants and invertebrates, fish, amphibians, earthworms, bees and other insects, birds, and small mammals (deer mice, mice and rats).<sup>34</sup> The PMRA compared concentrations found to have harmful effects in lab tests with the maximum concentrations expected to occur within crop fields from ground or aerial spraying, on nearby areas from spray drift, and in waterbodies from runoff. In general, they found only freshwater algae and marine fish to be at risk of negative impacts. The current guidelines for glyphosate in fresh water are listed in Table 3.1.

<sup>31</sup> International Agency for Research on Cancer. (2015). Some Organophosphate Insecticides and Herbicides: Diazinon, Glyphosate, Malathion, Parathion, and Tetrachlorvinphos. Volume 112. World Health Organization.

<sup>32</sup> De Roos, AJua, et al. "Integrative assessment of multiple pesticides as risk factors for non-Hodgkin's lymphoma among men." *Occupational and Environmental Medicine* 60.9 (2003): e11-e11.

<sup>33</sup> [http://nfdp.cfm.org/data/detailed/html/detailed\\_9110\\_MB.html](http://nfdp.cfm.org/data/detailed/html/detailed_9110_MB.html)

<sup>34</sup> Pest Management Regulatory Agency. (2015). Proposed Re-evaluation Decision – Glyphosate. Health Canada, Ottawa.

Although the PMRA re-evaluation review did not find serious risks to the animals and organisms tested, it does show that glyphosate as applied is two to three times more harmful than glyphosate alone, due to the additional chemicals present in the herbicide formulation.

Forestry studies conducted in the 1980s and 1990s show that larger animals such as moose and deer do not avoid eating plants sprayed with herbicides, but that use of herbicides reduces the amount of forage available.<sup>35</sup> The studies also found that the meat of snowshoe hare, white-tailed deer and moose showed no levels of glyphosate two months after spraying (with the exception of one sample which was thought to be contaminated during collection).<sup>36</sup> Other studies show that glyphosate does not bioaccumulate within living animals and insects to any great degree.<sup>37</sup> Overall, the use of herbicides to help regenerate clearcuts creates a different path of habitat change compared to other methods of weed control, because the types of plants present at each stage favour different kinds of insects, birds, amphibians and mammals.<sup>38</sup>

**Table 3.1. Current Canadian Guidelines for Fresh Water**

	Guideline (ug/L)	Maximum measured (ug/L)	Notes
Fresh water Short term	27,000	160 <sup>39</sup>	Forestry test spray directly on stream in British Columbia
Fresh water Long term	800	42 in Canada <sup>40</sup> 301 in US lakes, ponds, wetlands <sup>41</sup>	Previously set at 65 ug/L

The National Forestry Database also reports on the use of insecticides commonly used for forestry purposes. Only *Bacillus thuringiensis* (Bt) and tebufenozide are reported as being used in Manitoba between 1990 and 2013 (Figure 3.6), both for the control of spruce budworm and applied by aerial spraying.<sup>42</sup> Neither is currently known to increase the risk of developing cancer.

<sup>35</sup> Lautenschlager, R. A. "Effects of conifer release with herbicides on moose: browse production, habitat use, and residues in meat." *Alces* 28 (1992): 215-222.

<sup>36</sup> Lautenschlager, R. A., and Thomas P. Sullivan. "Effects of herbicide treatments on biotic components in regenerating northern forests." *The Forestry Chronicle* 78.5 (2002): 695-731.

<sup>37</sup> Pest Management Regulatory Agency. (2015). Proposed Re-evaluation Decision – Glyphosate. Health Canada, Ottawa.

<sup>38</sup> Lautenschlager, R. A., and Thomas P. Sullivan. "Effects of herbicide treatments on biotic components in regenerating northern forests." *The Forestry Chronicle* 78.5 (2002): 695-731.

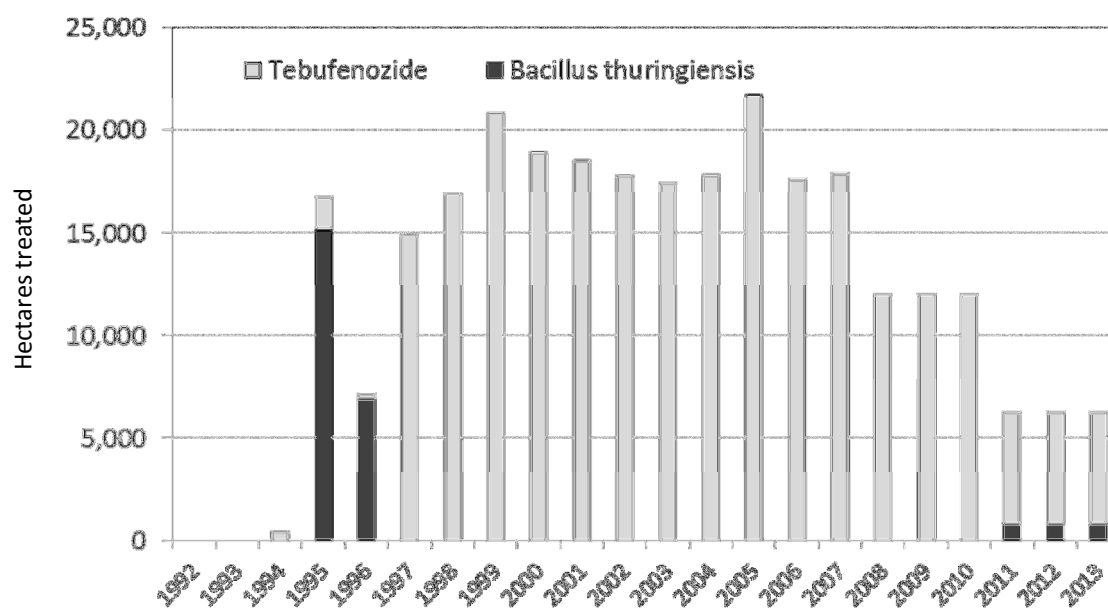
<sup>39</sup> Feng, Joseph C., Dean G. Thompson, and Philip E. Reynolds. "Fate of glyphosate in a Canadian forest watershed. 1. Aquatic residues and off-target deposit assessment." *Journal of Agricultural and Food Chemistry* 38.4 (1990): 1110-1118.

<sup>40</sup> Struger, J., D. R. Van Stempvoort, and S. J. Brown. "Sources of aminomethylphosphonic acid (AMPA) in urban and rural catchments in Ontario, Canada: Glyphosate or phosphonates in wastewater?." *Environmental Pollution* 204 (2015): 289-297.

<sup>41</sup> Battaglin, W. A., et al. "Glyphosate and its degradation product AMPA occur frequently and widely in US soils, surface water, groundwater, and precipitation." *JAWRA Journal of the American Water Resources Association* 50.2 (2014): 275-290.

<sup>42</sup> [http://nfdp.ccfm.org/data/detailed/html/detailed\\_9110\\_MB.html](http://nfdp.ccfm.org/data/detailed/html/detailed_9110_MB.html)



**Figure 3.6. Area treated with insecticides for forestry purposes in Manitoba - 1992 to 2013**

## 4. LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Any industry or company above a certain size, or that emits above specific threshold amounts must report their emissions annually to the National Pollutant Release Inventory (NPRI), maintained by Environment Canada.<sup>43</sup> In Manitoba, 29 known or suspected carcinogens were reported as being emitted between 1993 and 2013. Figure 4.1 shows the general locations for emitters by economic sector.

The total amount emitted for each of the 29 substances between 1993 and 2013 in Manitoba is presented in Table 4.1 (known carcinogens), Table 4.2 (probable carcinogens) and Table 4.3 (possible carcinogens).

NOTE: Not all substances are reported each year. Many reported emissions are based on estimates using production data and emission factors, not on actual monitoring, and reporting requirements have changed over time, so the totals may underestimate emissions.

Also included in these tables is a CAREX priority substance indicator (meaning that more information on the substance is available from the CAREX Canada website), and the last year emissions were reported to the NPRI, since some emitters stopped operating during this period (for example, Tembec's Pine Falls mill). Tables 4.4 to 4.21 show company names, amounts emitted, and First Nations within 50 km for each known, probable and possible carcinogen with recent emissions (reported between 2011 and 2013). Table 4.22 shows the same information for mercury, which is not classified as a carcinogen, but is of interest as it can be converted to methylmercury which is a possible carcinogen and is known to accumulate in fish.

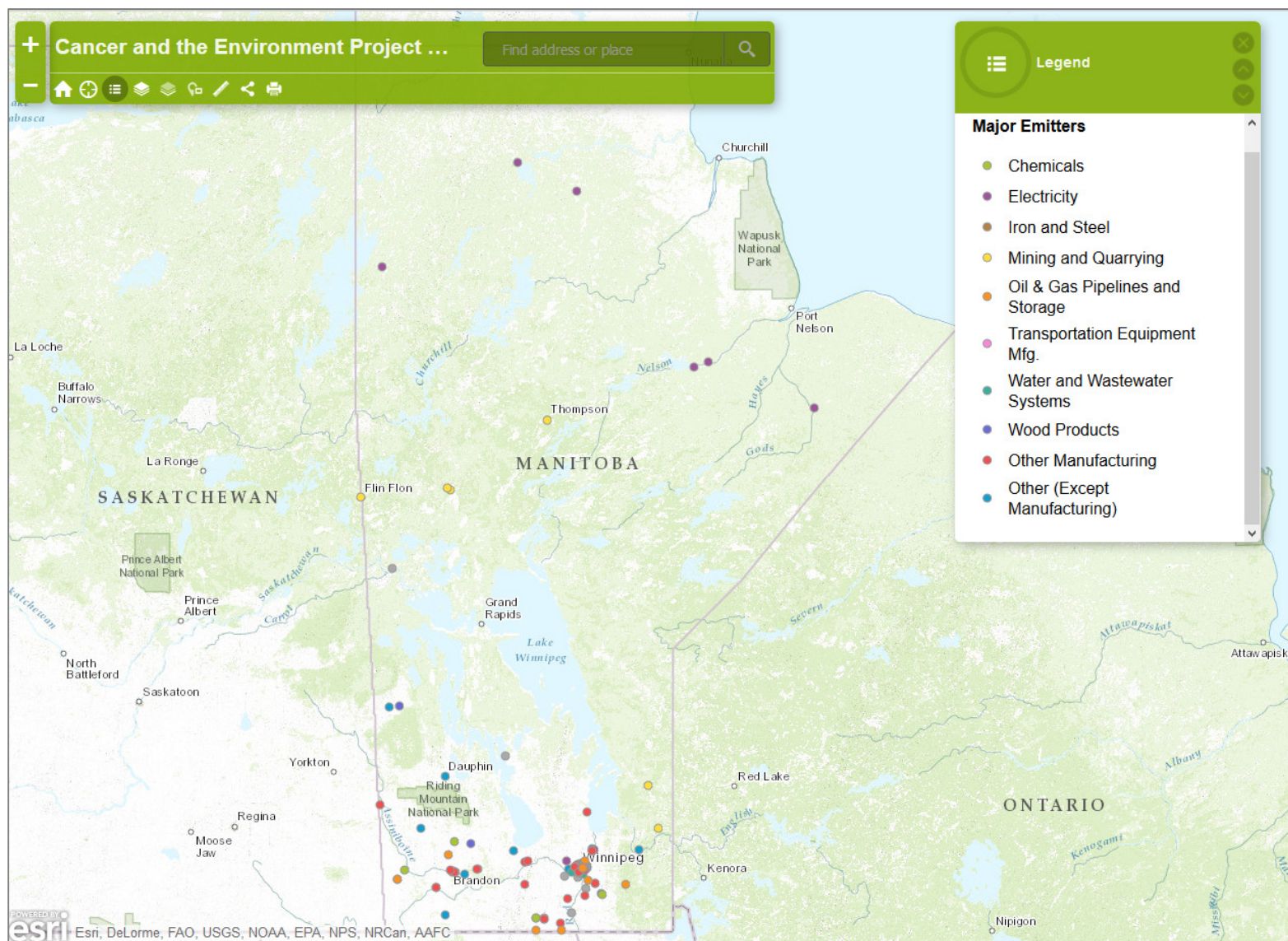
An interactive map of all companies reporting emissions to the NPRI anytime between 1993 is provided at the Cancer and the Environment Project [web map](#).<sup>44</sup> Each point in the map is linked to the NPRI website where full details are available on all substances emitted in any year since the creation of the NPRI.

---

<sup>43</sup> Environment Canada National Pollutant Release Inventory (NPRI) <https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=B85A1846-1>

<sup>44</sup> <http://www.arcgis.com/apps/Viewer/index.html?appid=64d79a0489e34c3ab7fb67685be19157>

Figure 4.1. Map of Emitters Reporting to the National Pollutant Release Inventory – 1993 to 2013



## LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.1. KNOWN CARCINOGENS**

Substance	Total Emissions (kg) AIR 1993 - 2013	Total Emissions (kg) WATER 1993 - 2013	Total Emissions (kg) LAND 1993 - 2013	CAREX priority*	Last Year of reported emissions
Arsenic (and its compounds)	409,536	15,776	0.01	Y	2013
Benzene	16,979			Y	2013
Cadmium (and its compounds)	403,800	2,948		Y	2013
Formaldehyde	124,763			Y	2013
Hexavalent chromium (and its compounds)	1,208	122	10	Y	2013
Nickel (and its compounds)	2,340,914	312,090	3,700	Y	2013
PAH - Benzo(a)pyrene	19			Y	2008
PM <sub>2.5</sub> - Particulate Matter <= 2.5 Microns	21,045,845			Y	2013
Trichloroethylene	59,934				2000

**Table 4.2. PROBABLE CARCINOGENS**

Substance	Total Emissions (kg) AIR 1993 - 2013	Total Emissions (kg) WATER 1993 - 2013	Total Emissions (kg) LAND 1993 - 2013	CAREX priority *	Last Year of reported emissions
Dichloromethane	227,091			Y	2002
Lead (and its compounds)	2,101,510	11,241	5	Y	2013
PAH - Dibenzo(a,j)acridine	0.7				2008
PAH - Dibenzo(a,h)anthracene	6				2008
Tetrachloroethylene	25,018			Y	2000

\* More information about CAREX priority substances can be found at [http://www.carexcanada.ca/en/profiles\\_and\\_estimates/](http://www.carexcanada.ca/en/profiles_and_estimates/)

**Table 4.3. POSSIBLE CARCINOGENS**

Substance	Total Emissions (kg) AIR 1993 - 2013	Total Emissions (kg) WATER 1993 - 2013	Total Emissions (kg) LAND 1993 - 2013	CAREX priority *	Last Year of reported emissions
Acetaldehyde	319,490	4,937	-	Y	2013
Cobalt (and its compounds)	48,737	8,117	-		2013
Diethanolamine (and its salts)	2,250	-	-		2006
Ethylbenzene	181,234	-	17	Y	2013
Hexachlorobenzene	9	-	-		2013
Methyl isobutyl ketone	187,548	-	-		2013
Naphthalene	4,086	-	-		2011
PAH - Benzo(a)anthracene	77	-	-	Y	2013
PAH - Benzo(a)phenanthrene (Chrysene)	23	-	-	Y	2013
PAH - Benzo(b)fluoranthene	33	-	-	Y	2008
PAH - Benzo(j)fluoranthene	0.3	-	-		2006
PAH - Benzo(k)fluoranthene	13	-	-	Y	2008
PAH - Dibenzo(a,i)pyrene	2	-	-		2008
PAH - Indeno(1,2,3-CD)pyrene	15	-	-	Y	2013
Styrene	1,090,026	-	-		2013

\* More information about CAREX priority substances can be found at [http://www.carexcanada.ca/en/profiles\\_and\\_estimates/](http://www.carexcanada.ca/en/profiles_and_estimates/)

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.4 ARSENIC AND ITS COMPOUNDS – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000011623	SANGOLD CORPORATION	MILL & MINE SITE	Bissett	Mining and Quarrying	0.003		Hollow Water Little Black River	44 50
0000003414	HUDSON BAY MINING AND SMELTING CO.	HBMS METALL-URGICAL COMPLEX	Flin Flon	Mining and Quarrying	109	477		
0000003411	HUDSON BAY MINING AND SMELTING CO.	HBMS SNOW LAKE MILL	Snow Lake	Mining and Quarrying	26			
0000005219	SNOW LAKE MINE	NEW BRITANNIA MINE	Snow Lake	Mining and Quarrying	279			
0000002051	TOLKO INDUSTRIES LTD.	MANITOBA KRAFT PAPERS DIVISION	The Pas	Pulp and Paper	21	199	Opaskwayak Cree Nation	6
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Mining and Quarrying	3,885	1,026		
0000023274	CANICKEL MINING LTD.	BUCKO LAKE MINE	Wabowden	Mining and Quarrying	0.02	0.2		
0000005386	CITY OF WINNIPEG, WATER & WASTE DEPARTMENT	NORTH END WATER POLLUTION CONTROL CENTRE	Winnipeg	Water and Wastewater Systems	343			
0000006853	HUSKY OIL OPERATIONS LIMITED	MINNEDOSA ETHANOL PLANT	Minnedosa	Chemicals	56		Keeseekoowenin Rolling River	45 27
0000010237	IMPERIAL OIL	WINNIPEG TERMINAL	Winnipeg	Oil & Gas Pipelines and Storage	1,039			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.5 BENZENE – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000006853	HUSKY OIL OPERATIONS LIMITED	MINNEDOSA ETHANOL PLANT	Minnedosa	Chemicals	56		Keeseekoowenin	45
							Rolling River	27
0000010237	IMPERIAL OIL	WINNIPEG TERMINAL	Winnipeg	Oil & Gas Pipelines and Storage	1,039			

**Table 4.6 CADMIUM AND ITS COMPOUNDS – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000011623	SANGOLD CORPORATION	MILL & MINE SITE	Bissett	Mining and Quarrying	0.0005		Hollow Water	44
							Little Black River	50
0000000821	MANITOBA HYDRO	BRANDON GENERATING STATION	Brandon	Electricity	0.1	0.1	Sioux Valley Dakota Nation	43
0000006825	GRAYMONT WESTERN CANADA INC.	FAULKNER PLANT	Faulkner	Cement, Lime and Other Non-Metallic Minerals	4		Ebb and Flow	44
							Lake St. Martin	43
							Little Saskatchewan	32
							O-Chi-Chak-Ko-Sipi First Nation	33
							Pinaymootang First Nation	21
0000003414	HUDSON BAY MINING AND SMELTING CO., LIMITED	HBMS METALLURGICAL COMPLEX	Flin Flon	Mining and Quarrying	2,230	55		



# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.6 CADMIUM AND ITS COMPOUNDS – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000004881	LOUISIANA-PACIFIC CANADA LTD.	LP SWAN VALLEY OSB	Minitonas	Wood Products	0.2		Wuskwi Sipihk First Nation	49
0000003411	HUDSON BAY MINING AND SMELTING CO., LIMITED	HBMS SNOW LAKE MILL	Snow Lake	Mining and Quarrying	0.9			
0000002051	TOLKO INDUSTRIES LTD.	MANITOBA KRAFT PAPERS DIVISION	The Pas	Pulp and Paper	63	11	Opaskwayak Cree Nation	6
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Mining and Quarrying	962	17		
0000023274	CANICKEL MINING LIMITED	BUCKO LAKE MINE	Wabowden	Mining and Quarrying	0.001			
0000005386	CITY OF WINNIPEG, WATER & WASTE DEPARTMENT	NORTH END WATER POLLUTION CONTROL CENTRE (NEWPCC)	Winnipeg	Water and Wastewater Systems	15			
0000017945	STANDARD AERO LTD.	WINNIPEG	Winnipeg	Transport'n Equipment Mfg.	0.2			



# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.7 FORMALDEHYDE – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
000000159	BUNGE CANADA HOLDINGS I ULC	BUNGE CANADA - ALTONA PLANT	Altona	Other Manufact.	21		Roseau River Anishinabe First Nation Government	22
0000002515	KOCH FERTILIZER CANADA, ULC	KOCH FERTILIZER CANADA, ULC	Brandon	Chemicals	790		Sioux Valley Dakota Nation	42
0000004881	LOUISIANA-PACIFIC CANADA LTD.	LP SWAN VALLEY OSB	Minitonas	Wood Products	70,545		Wuskwi Sipihk First Nation	49
0000001866	DEFEHR FURNITURE LTD.	DEFEHR FURNITURE LTD.	Winnipeg	Wood Products	15			

**Table 4.8 HEXAVALENT CHROMIUM – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000003517	CANEXUS CORPORATION - BRANDON	CANEXUS CORPORATION	Brandon	Chemicals	0.8		Sioux Valley Dakota Nation	48
0000002051	TOLKO INDUSTRIES LTD.	MANITOBA KRAFT PAPERS DIVISION	The Pas	Pulp and Paper	3	15	Opaskwayak Cree Nation	6
0000006854	ERCO WORLDWIDE, A DIVISION OF SUPERIOR PLUS LP	HARGRAVE PLANT	Virden	Chemicals	0.2		Birdtail Sioux Sioux Valley Dakota Nation	48 30

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.8 HEXAVALENT CHROMIUM – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000000629	BOEING CANADA OPERATIONS LTD.	BOEING CANADA WINNIPEG	Winnipeg	Transport'n Equipment Mfg.	5			
0000002454	CLOVERDALE PAINT INC.	GUERTIN COATINGS DIV. OF CLOVERDALE PAINT INC.	Winnipeg	Chemicals	10			
0000017365	KEYSTONE AUTOMOTIVE INDUSTRIES ON INC.	NORTHSTAR/FAIR MONT PLATING - WINNIPEG	Winnipeg	Other Manufact.	4			
0000017945	STANDARD AERO LTD.	WINNIPEG	Winnipeg	Transport'n Equipment Mfg.	6			

**Table 4.9 NICKEL AND ITS COMPOUNDS – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000011623	SANGOLD CORPORATION	MILL & MINE SITE	Bissett	Mining and Quarrying	0.2		Hollow Water	44
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Mining and Quarrying	53,991	27,000	Little Black River	50
0000004820	ROYAL CANADIAN MINT	WINNIPEG MINT	Winnipeg	Other Manufact.	16			
0000005696	RUSSEL METALS INC.	WINNIPEG NORTH	Winnipeg	Other (Except Manufact.)	0.2			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.10 FINE PARTICULATES (PM <sub>2.5</sub> ) – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
000000159	BUNGE CANADA HOLDINGS I ULC	BUNGE CANADA - ALTONA PLANT	Altona	Other Manufact.	33,703		Roseau River Anishinabe First Nation Government	22
0000026280	MAPLE LEAF AGRI-FARMS INC.	PURATONE ARBORG FEEDMILL	Arborg	Other Manufact.	320		Peguis	50
0000019286	VITERRA INC.		Binscarth	Other (Except Manufact.)	236		Birdtail Sioux Gamblers Waywayseecappo First Nation Treaty Four - 1874	41 7 26
0000011623	SANGOLD CORPORATION	MILL & MINE SITE	Bissett	Mining and Quarrying	1,536		Hollow Water Little Black River	44 50
0000000821	MANITOBA HYDRO	BRANDON GENERATING STATION	Brandon	Electricity	17,300		Sioux Valley Dakota Nation	43
0000002515	KOCH FERTILIZER CANADA, ULC	KOCH FERTILIZER CANADA, ULC	Brandon	Chemicals	9,669		Sioux Valley Dakota Nation	42
0000003517	CANEXUS CORPORATION - BRANDON	CANEXUS CORPORATION	Brandon	Chemicals	7,817		Sioux Valley Dakota Nation	48
0000005317	MAPLE LEAF CONSUMER FOODS INC.	MAPLE LEAF FOODS - BRANDON	Brandon	Other Manufact.	1,685		Sioux Valley Dakota Nation	46
0000006699	FEDERATED CO-OPERATIVES LTD.	BRANDON FEED PLANT	Brandon	Other Manufact.	652		Sioux Valley Dakota Nation	39

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.10 FINE PARTICULATES (PM <sub>2.5</sub> ) – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000019136	VITERRA INC.	Brandon		Other (Except Manufact.)	333		Canupawakpa Dakota First Nation Birdtail Sioux	39
0000019138	VITERRA INC.		Brandon	Other (Except Manufact.)	538		Sioux Valley Dakota Nation	31
0000024233	RICHARDSON PIONEER LTD.	BRANDON	Brandon	Other (Except Manufact.)	1,690		Sioux Valley Dakota Nation	47
0000017180	MANITOBA HYDRO	BROCHET	Brochet	Electricity	2,140		Barren Lands	27
0000023175	RICHARDSON PIONEER LTD.	MOLLARD	Brunkild	Other (Except Manufact.)	2,047			49
0000007183	MCCAIN FOODS CANADA LTD.	CARBERRY FACTORY	Carberry	Other Manufact.	8,030			
0000005242	VITERRA INC.	CARMAN FEED MILL VITERRA	Carman	Other Manufact.	85		Dakota Plains	50
0000027819	HI-PRO FEEDS	HI-PRO FEEDS CARMAN	Carman	Other Manufact.	2,793		Dakota Plains	50
0000006905	ENBRIDGE PIPELINES INC.		Cromer	Oil & Gas Pipelines and Storage	5		Sioux Valley Dakota Nation	44
0000018267	RICHARDSON PIONEER LTD.	DAUPHIN	Dauphin	Other (Except Manufact.)	683			
0000022606	CARGILL LIMITED	CARGILL AGHORIZONS, DAUPHIN, MB	Dauphin	Other (Except Manufact.)	1,159			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.10 FINE PARTICULATES (PM <sub>2.5</sub> ) – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000023117	CARGILL LIMITED	CARGILL AGHORIZONS, ELM CREEK, MB	Elm Creek	Other (Except Manufact.)	2,302		Dakota Plains Dakota Tipi	39 40
0000006825	GRAYMONT WESTERN CANADA INC.	FAULKNER PLANT	Faulkner	Cement, Lime and Other Non-Metallic Minerals	184,475		Ebb and Flow Lake St. Martin Little Saskatchewan O-Chi-Chak-Ko-Sipi First Nation Pinaymootang First Nation	44 43 32 33 21
0000002097	DIAGEO CANADA INC.	GIMLI PLANT	Gimli	Other Manufact.	3,948		Brokenhead Ojibway Nation Fort Alexander	44 47
0000022735	CARGILL LIMITED	CARGILL AGHORIZONS, OAKNER, MB	Hamiota	Other (Except Manufact.)	1,633		Birdtail Sioux Sioux Valley Dakota Nation	45 26
0000004896	BUNGE CANADA HOLDINGS I ULC	BUNGE CANADA - HARROWBY PLANT	Harrowby	Other Manufact.	38,322		Gamblers Waywayseecappo First Nation Treaty Four - 1874	18 38
0000024156	RICHARDSON PIONEER LTD.	TLA KILLARNEY EAST	Killarney	Other (Except Manufact.)	1,083			
0000017181	MANITOBA HYDRO		Lac Brochet	Electricity	2,470			
0000002278	TANTALUM MINING OF CANADA	BERNIC LAKE MINESITE	Lac du Bonnet	Mining and Quarrying	1,736			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.10 FINE PARTICULATES (PM <sub>2.5</sub> ) – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
000006552	MAPLE LEAF AGRI-FARMS INC.	FEED PLANT, LANDMARK	Landmark	Other Manufact.	2,035			
0000023241	CARGILL LIMITED		Melita	Other (Except Manufact.)	2,405		Canupawakpa Dakota First Nation	41
0000004881	LOUISIANA-PACIFIC CANADA LTD.	LP SWAN VALLEY OSB	Minitonas	Wood Products	21,160		Wuskwi Sipiik First Nation	49
000006853	HUSKY OIL OPERATIONS LIMITED	MINNEDOSA ETHANOL PLANT	Minnedosa	Chemicals	12,583		Keeseekoowenin Rolling River	45 27
0000018276	RICHARDSON PIONEER LTD.	MINNEDOSA	Minnedosa	Other (Except Manufact.)	392		Keeseekoowenin Rolling River	46 28
0000022603	CARGILL LIMITED	CARGILL AGHORIZONS, MORRIS, MB	Morris	Other (Except Manufact.)	2,689		Roseau River Anishinabe First Nation Government	21
0000021487	ENERPLUS CORPORATION	KIRKELLA OIL BATTERY 07-10	n/a	Oil and Gas Extraction	489		Birdtail Sioux	34
0000023296	ARC RESOURCES	GOODLANDS OIL BATTERY 16-10	n/a	Oil and Gas Extraction	64,825		Canupawakpa Dakota First Nation	38
0000026071	LEGACY OIL + GAS INC.	PIERSON OIL BATTERY 09-32	n/a	Oil and Gas Extraction	14,376			
0000027126	EOG RESOURCES CANADA INC.	WASKADA SOUR GAS PLANT 16-21	n/a	Oil and Gas Extraction	58,865		Canupawakpa Dakota First Nation	38
0000023116	PENN WEST PETROLEUM LTD.		na	Oil and Gas Extraction	209,036		Canupawakpa Dakota First Nation	38

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.10 FINE PARTICULATES (PM<sub>2.5</sub>) – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000024648	PETROBAKKEN ENERGY LTD.		na	Oil and Gas Extraction	413		Canupawakpa Dakota First Nation	32
0000026027	PENN WEST PETROLEUM LTD.		na	Oil and Gas Extraction	1,555		Canupawakpa Dakota First Nation	38
0000026028	PENN WEST PETROLEUM LTD.		na	Oil and Gas Extraction	322		Canupawakpa Dakota First Nation	38
0000026029	PENN WEST PETROLEUM LTD.		na	Oil and Gas Extraction	2,463		Canupawakpa Dakota First Nation	41
0000026030	PENN WEST PETROLEUM LTD.		na	Oil and Gas Extraction	349		Canupawakpa Dakota First Nation	34
0000027267	CANADIAN NATURAL RESOURCES LIMITED		na	Oil and Gas Extraction	388			
0000022608	CARGILL LIMITED	CARGILL AGHORIZONS, NESBITT, MB	Nesbitt	Other (Except Manufact.)	1,188		Sioux Valley Dakota Nation	50
0000006663	SPECTIS MOULDERS	SPECTIS MOULDERS - NIVERVILLE	Niverville	Plastics and Rubber	1,101			
0000006553	LANDMARK FEEDS	OTTERBURNE	Otterburne	Other Manufact.	7,330		Roseau River Anishinabe First Nation Government	41
0000007434	ATOMIC ENERGY OF CANADA LTD.	WHITESHELL LABORATORIES	pinawa	Other (Except Manufact.)	297			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.10 FINE PARTICULATES (PM <sub>2.5</sub> ) – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000006665	RICHARDSON MILLING LTD.	PORTAGE LA PRAIRIE	Portage La Prairie	Other Manufact.	4,898		Dakota Plains Dakota Tipi Long Plain	20 2 15
0000006833	AGRIUM INC.	BLOOM TERMINAL	Portage La Prairie	Other (Except Manufact.)	437		Dakota Plains Dakota Tipi Long Plain	22 4 17
0000006938	MCCAIN FOODS CANADA LTD.	MCCAIN FOODS - PORTAGE LA PRAIRIE	Portage La Prairie	Other Manufact.	5,453		Dakota Plains Dakota Tipi Long Plain	26 8 21
0000021477	SIMPLOT CANADA (II) LTD.	PORTAGE LA PRAIRIE	Portage La Prairie	Other Manufact.	3,974		Dakota Plains Dakota Tipi Long Plain	19 3 14
0000025145	LOUIS DREYFUS COMMODITIES CANADA LTD	LOUIS DREYFUS COMMODITIES CANADA LTD. - RATHWELL	Rathwell	Other (Except Manufact.)	2,816		Dakota Plains Dakota Tipi Long Plain	18 36 24
0000024231	LEHIGH HANSON MATERIALS LTD.			Mining and Quarrying	3,735		Brokenhead Ojibway Nation Fort Alexander	23 39
0000021952	LEHIGH HANSON MATERIALS LTD.	PINE RIDGE		Mining and Quarrying	1,039		Brokenhead Ojibway Nation	49
0000005246	GERDAU AMERISTEEL CORPORATION	GERDAU AMERISTEEL CORPORATION, MANITOBA METALLICS RAW MATERI	RM of St. Andrews	Other (Except Manufact.)	1,811		Brokenhead Ojibway Nation	28



# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.10 FINE PARTICULATES (PM <sub>2.5</sub> ) – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000006642	LANDMARK FEEDS	ROSENORT	Rosenort	Other Manufact.	5,250		Roseau River Anishinabe First Nation Government	34
0000021058	BFI CANADA INC.	PRAIRIE GREEN IWMF	Rosser	Waste Treatment and Disposal	2			
0000001651	GERDAU AMERISTEEL CORPORATION	GERDAU AMERISTEEL CORPORATION, MANITOBA MILL	Selkirk	Iron and Steel	32,918		Brokenhead Ojibway Nation	31
0000017179	MANITOBA HYDRO		Shamattawa	Electricity	3,400		Shamattawa First Nation	2
0000018283	RICHARDSON PIONEER LTD.	SHOAL LAKE	Shoal Lake	Other (Except Manufact.)	2,178		Birdtail Sioux Keeseekoowenin Rolling River Waywayseecappo FTN4 - 1874	44 24 42 35
0000005219	SNOW LAKE MINE	NEW BRITANNIA MINE	Snow Lake	Mining and Quarrying	1,440			
0000005327	VITERRA INC.	Souris		Other (Except Manufact.)	1,525		Canupawakpa Dakota First Nation Sioux Valley Dakota Nation	35 31
0000017178	MAPLE LEAF AGRI-FARMS INC.	Souris		Other Manufact.	2,074		Canupawakpa Dakota First Nation Sioux Valley Dakota Nation	35 30

LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.10 FINE PARTICULATES (PM <sub>2.5</sub> ) – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000011644	PARMALAT CANADA INC.	ST. CLAUDE	St. Claude	Other Manufact.	13,332		Dakota Plains Dakota Tipi Long Plain Swan Lake	20 31 23 48
0000023797	VITERRA INC.	STE. AGATHE (CANOLA CRUSH PLANT)	Ste. Agathe	Other Manufact.	3,211		Roseau River Anishinabe First Nation Government	45
0000006976	VITERRA INC.	HART FEEDS FEED MILL (ST. ANNE MB) VITERRA	Ste. Anne	Other Manufact.	151			
0000027825	HI-PRO FEEDS	HI-PRO FEEDS STE. ANNE	Ste. Anne	Other Manufact.	7,044			
0000000851	C.P. LOEWEN ENTERPRISES LTD.	LOEWEN	Steinbach	Wood Products	12,000			
0000015089	RICHARDSON PIONEER LTD.	SOUTH LAKES	Stonewall	Other (Except Manufact.)	17,232			
0000021961	LAFARGE NORTH AMERICA			Mining and Quarrying	14,327			
0000011724	CARGILL LIMITED	CARGILL AGHORIZONS, SWAN RIVER, MB	Swan River	Other (Except Manufact.)	1,472			
0000019994	RICHARDSON PIONEER LTD.	SWAN RIVER VALLEY	Swan River	Other (Except Manufact.)	1,074			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.10 FINE PARTICULATES (PM <sub>2.5</sub> ) – KNOWN CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000017182	MANITOBA HYDRO		Tadoule Lake	Electricity	2,030		Sayisi Dene First Nation	<1
0000002051	TOLKO INDUSTRIES LTD.	MANITOBA KRAFT PAPERS DIVISION	The Pas	Pulp and Paper	1,990,454		Opaskwayak Cree Nation	6
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Mining and Quarrying	796,280			
0000006854	ERCO WORLDWIDE, A DIVISION OF SUPERIOR PLUS LP	HARGRAVE PLANT	Virden	Chemicals	1,698		Birdtail Sioux Sioux Valley Dakota Nation	48 30
0000025147	LOUIS DREYFUS COMMODITIES CANADA LTD	LOUIS DREYFUS COMMODITIES CANADA LTD. - VIRDEN	Virden	Other (Except Manufact.)	1,707		Birdtail Sioux Sioux Valley Dakota Nation	42 38
0000023274	CANICKEL MINING LIMITED	BUCKO LAKE MINE	Wabowden	Mining and Quarrying	1,760			
0000015088	VITERRA INC.		Winkler	Other (Except Manufact.)	21,140		Roseau River Anishinabe First Nation Government	48
0000024203	MONARCH INDUSTRIES LIMITED	WINKLER FACILITY	Winkler	Iron and Steel	11,660		Roseau River Anishinabe First Nation Government	48
0000000476	KITCHEN CRAFT OF CANADA	KITCHEN CRAFT OF CANADA	Winnipeg	Other Manufact.	2,600			
0000001656	MOTOR COACH INDUSTRIES	FORT GARRY PLANTS 4 & 5	Winnipeg	Transport'n Equipment Mfg.	6,010			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.10 FINE PARTICULATES (PM<sub>2.5</sub>) – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000001659	FRANK FAIR INDUSTRIES LTD.	FRANK FAIR INDUSTRIES	Winnipeg	Chemicals	1,029			
0000001866	DEFEHR FURNITURE LTD.	DEFEHR FURNITURE LTD.	Winnipeg	Wood Products	3,921			
0000002454	CLOVERDALE PAINT INC.	GUERTIN COATINGS	Winnipeg	Chemicals	25			
0000002511	ANCAST INDUSTRIES LTD.	ANCAST INDUSTRIES LTD.	Winnipeg	Iron and Steel	22,555			
0000004820	ROYAL CANADIAN MINT	WINNIPEG MINT	Winnipeg	Other Manufact.	2,871			
0000005269	MAPLE LEAF CONSUMER FOODS INC.	CONSUMER FOODS - WINNIPEG	Winnipeg	Other Manufact.	2,987			
0000005386	CITY OF WINNIPEG, WATER & WASTE DEPARTMENT	NORTH END WATER POLLUTION CONTROL CENTRE (NEWPCC)	Winnipeg	Water and Wastewater Systems	28,296			
0000005696	RUSSEL METALS INC.	WINNIPEG NORTH	Winnipeg	Other (Except Manufact.)	1,719			
0000006218	GRACE CANADA INC.	GRACE CONSTRUCTION PRODUCTS - 5	Winnipeg	Chemicals	657			
0000006661	DEPARTMENT OF NATIONAL DEFENCE	17 WING WINNIPEG	Winnipeg	Other (Except Manufact.)	492			
0000006836	UNIVERSITY OF MANITOBA	CENTRAL ENERGY PLANT (POWERHOUSE)	Winnipeg	Other (Except Manufact.)	1,470			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.10 FINE PARTICULATES (PM<sub>2.5</sub>) – KNOWN CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
000006973	DEFEHR FURNITURE LTD.	PARTICLE BOARD PLANT/PANEL SUPPLY PLANT	Winnipeg	Wood Products	819			
0000010248	ADM Agri-Industries	ADM AGRI-INDUSTRIES - ADM Milling Co. - Winnipeg	Winnipeg	Other Manufact.	12,101			
0000017945	STANDARD AERO LTD.	WINNIPEG	Winnipeg	Transport'n Equipment Mfg.	776			
0000019384	CERTAINTED GYPSUM CANADA, INC.	WINNIPEG WALLBOARD PLANT	Winnipeg	Cement, Lime and Other Non-Metallic Minerals	6,986			
0000023559	GENERAL MILLS CANADA	GENERAL MILLS - WINNIPEG	Winnipeg	Other Manufact.	3,660			
0000025418	CANADIAN LINEN & UNIFORM SERVICE	CANADIAN LINEN & UNIFORM SERVICE - D24	Winnipeg	Other (Except Manufact.)	1,269			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.11 LEAD AND ITS COMPOUNDS – PROBABLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000011623	SANGOLD CORPORATION	MILL & MINE SITE	Bissett	Mining and Quarrying		0.2	Hollow Water Little Black River	44 50
0000006825	GRAYMONT WESTERN CANADA INC.	FAULKNER PLANT	Faulkner	Cement, Lime and Other Non-Metallic Minerals	22		Ebb and Flow Lake St. Martin Little Saskatchewan O-Chi-Chak-Ko-Sipi First Nation Pinaymootang First Nation	44 43 32 33 21
0000003414	HUDSON BAY MINING AND SMELTING CO., LIMITED	HBMS METALLURGICAL COMPLEX	Flin Flon	Mining and Quarrying	235			
0000021544	HUDSON BAY MINING AND SMELTING CO., LIMITED	HBMS TROUT LAKE MINE	Flin Flon	Mining and Quarrying	3			
0000005246	GERDAU AMERISTEEL CORPORATION	MANITOBA METALLICS RAW MATERIALS	RM of St. Andrews	Other (Except Manufact.)			Brokenhead Ojibway Nation	28
0000001651	GERDAU AMERISTEEL CORPORATION	GERDAU AMERISTEEL CORPORATION, MANITOBA MILL	Selkirk	Iron and Steel	2		Brokenhead Ojibway Nation	31
0000003411	HUDSON BAY MINING AND SMELTING CO., LIMITED	HBMS SNOW LAKE MILL	Snow Lake	Mining and Quarrying	67			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.11 LEAD AND ITS COMPOUNDS – PROBABLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
000005219	SNOW LAKE MINE	NEW BRITANNIA MINE	Snow Lake	Mining and Quarrying	0.07			
0000021543	HUDSON BAY MINING AND SMELTING CO., LIMITED	HBMS CHISEL LAKE MINE	Snow Lake	Mining and Quarrying	25			
0000002051	TOLKO INDUSTRIES LTD.	MANITOBA KRAFT PAPERS DIVISION	The Pas	Pulp and Paper	56	0.001	Opaskwayak Cree Nation	6
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Mining and Quarrying	49			
0000023274	CANICKEL MINING LIMITED	BUCKO LAKE MINE	Wabowden	Mining and Quarrying	0.2			
0000000762	PPG PHILLIPS INDUSTRIAL COATINGS INC	PPG PHILLIPS INDUSTRIAL COATINGS - WINNIPEG	Winnipeg	Chemicals				
0000002454	CLOVERDALE PAINT INC.	GUERTIN COATINGS DIV. OF CLOVERDALE PAINT INC.	Winnipeg	Chemicals		5		
0000005386	CITY OF WINNIPEG, WATER & WASTE DEPARTMENT	NORTH END WATER POLLUTION CONTROL CENTRE	Winnipeg	Water and Wastewater Systems	137			
0000005387	CITY OF WINNIPEG, WATER & WASTE DEPARTMENT	SOUTH END WATER POLLUTION CONTROL CENTRE	Winnipeg	Water and Wastewater Systems	36			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.11 LEAD AND ITS COMPOUNDS – PROBABLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000017365	KEYSTONE AUTOMOTIVE INDUSTRIES ON INC.	NORTHSTAR/ FAIRMONT PLATING - WINNIPEG	Winnipeg	Other Manufact.	0.1			

**Table 4.12 ACETALDEHYDE – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000002051	TOLKO INDUSTRIES LTD.	MANITOBA KRAFT PAPERS DIVISION	The Pas	Pulp and Paper	43,626	904	Opaskwayak Cree Nation	6

**Table 4.13 COBALT AND ITS COMPOUNDS – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000011623	SANGOLD CORPORATION	MILL & MINE SITE	Bissett	Mining and Quarrying	0.1		Hollow Water	44
							Little Black River	50
0000005242	VITERRA INC.	CARMAN FEED MILL VITERRA	Carman	Other Manufacturing	327		Dakota Plains	50
0000027825	HI-PRO FEEDS	HI-PRO FEEDS	Ste. Anne	Other Manufacturing	0.7			
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Mining and Quarrying	1,794	310		



# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.14 ETHYLBENZENE – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000000476	KITCHEN CRAFT OF CANADA	KITCHEN CRAFT OF CANADA	Winnipeg	Other Manufact.	34,500			
0000002337	UNIVAR CANADA LTD.	WINNIPEG	Winnipeg	Other (Except Manufact.)	75			
0000005303	AKZO NOBEL WOOD COATINGS LTD.	AKZONOBEL WOOD COATINGS (WINNIPEG)	Winnipeg	Chemicals	300			

**Table 4.15 HEXACHLOROBENZENE – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000000821	MANITOBA HYDRO	BRANDON GENERATING STATION	Brandon	Electricity	0.06		Sioux Valley Dakota Nation	43
0000001651	GERDAU AMERISTEEL CORPORATION	GERDAU AMERISTEEL CORPORATION, MANITOBA MILL	Selkirk	Iron and Steel	1		Brokenhead Ojibway Nation	31
0000002051	TOLKO INDUSTRIES LTD.	MANITOBA KRAFT PAPERS DIVISION	The Pas	Pulp and Paper	0.002		Opaskwayak Cree Nation	6

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.16 METHYL ISOBUTYL KETONE – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000005310	DECOR CABINETS LTD.	DECOR CABINETS	Morden	Wood Products	27,603			
0000000476	KITCHEN CRAFT OF CANADA	KITCHEN CRAFT OF CANADA	Winnipeg	Other Manufacturing	9,100			
0000000762	PPG PHILLIPS INDUSTRIAL COATINGS INC	PPG PHILLIPS INDUSTRIAL COATINGS - WINNIPEG	Winnipeg	Chemicals	740			
0000002337	UNIVAR CANADA LTD.	WINNIPEG	Winnipeg	Other (Except Manufacturing)	4			
0000002454	CLOVERDALE PAINT INC.	GUERTIN COATINGS DIV. OF CLOVERDALE PAINT INC.	Winnipeg	Chemicals	225			

**Table 4.17 NAPHTHALENE – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000024203	MONARCH INDUSTRIES LIMITED	MONARCH INDUSTRIES - WINKLER FACILITY	Winkler	Iron and Steel	900		Roseau River Anishinabe First Nation Government	48
0000004826	INTERPROV. COOPERATIVE LTD.	CHEMICAL PLANT	Winnipeg	Chemicals	388			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.18 PAH - BENZO(A)ANTHRACENE – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000010237	IMPERIAL OIL	WINNIPEG TERMINAL	Winnipeg	Oil & Gas Pipelines and Storage	0.003			

**Table 4.19 PAH - BENZO(A)PHENATHRENE (CHRYSENE) – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000010237	IMPERIAL OIL	WINNIPEG TERMINAL	Winnipeg	Oil & Gas Pipelines and Storage	0.006			

**Table 4.20 PAH – INDENO(1,2,3-CD)PYRENE – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000010237	IMPERIAL OIL	WINNIPEG TERMINAL	Winnipeg	Oil & Gas Pipelines and Storage	0.002			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

Table 4.21 STYRENE – POSSIBLE CARCINOGEN – emissions reported 2011 - 2013								
NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000004825	FAROEX LTD.	PLANT 1	Gimli	Other Manufacturing	5,220			
0000002304	TRIPLE E RV	TRIPLE E RV	Winkler	Transportation Equipment Mfg.	7,580		Roseau River Anishinabe First Nation Government	48
0000001659	FRANK FAIR INDUSTRIES LTD.	FRANK FAIR INDUSTRIES - WINNIPEG	Winnipeg	Chemicals	154,690			
0000016933	FIAT PRODUCTS	FIAT PRODUCTS - WINNIPEG	Winnipeg	Plastics and Rubber	14,507			

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.22 MERCURY – POSSIBLE CARCINOGEN WHEN CONVERTED TO METHYL MERCURY – emissions reported 2011 – 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000006825	GRAYMONT WESTERN CANADA INC.	FAULKNER PLANT	Faulkner	Cement, Lime and Other Non-Metallic Minerals	2		Ebb and Flow Lake St. Martin Little Saskatchewan O-Chi-Chak-Ko-Sipi First Nation Pinaymootang First Nation	44 43 32 33 21
0000003414	HUDSON BAY MINING AND SMELTING CO.	HBMS METALLURGICAL COMPLEX	Flin Flon	Mining and Quarrying		0.1		
0000021544	HUDSON BAY MINING AND SMELTING CO.	HBMS TROUT LAKE MINE	Flin Flon	Mining and Quarrying		0.001		
0000001651	GERDAU AMERISTEEL CORPORATION	GERDAU AMERISTEEL CORPORATION, MANITOBA MILL	Selkirk	Iron and Steel	59	0.03	Brokenhead Ojibway Nation	31
0000003411	HUDSON BAY MINING AND SMELTING CO.	HBMS SNOW LAKE MILL	Snow Lake	Mining and Quarrying		0.04		
0000021543	HUDSON BAY MINING AND SMELTING CO.	HBMS CHISEL LAKE MINE	Snow Lake	Mining and Quarrying		0.003		
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Mining and Quarrying	0.01	0.2		
0000005386	CITY OF WINNIPEG, WATER & WASTE DEPARTMENT	NORTH END WATER POLLUTION CONTROL CENTRE	Winnipeg	Water and Wastewater Systems		1		

# LARGE INDUSTRIAL AND COMMERCIAL EMITTERS

**Table 4.22 MERCURY – POSSIBLE CARCINOGEN WHEN CONVERTED TO METHYL MERCURY – emissions reported 2011 – 2013**

NRPI Identifier	Company Name	Facility Name	City	Sector	Total Emissions (kg) AIR 2011 - 2013	Total Emissions (kg) WATER 2011 - 2013	First Nations reserves within 50 km	Distance from Emitter (km)
0000005387	CITY OF WINNIPEG, WATER & WASTE DEPARTMENT	SOUTH END WATER POLLUTION CONTROL CENTRE	Winnipeg	Water and Wastewater Systems		0.3		

## 5. CONTAMINATED SITES AND MINE TAILINGS

Federally, a contaminated site is “one at which substances occur at concentrations above background (normally occurring) levels and pose or are likely to pose an immediate or long term hazard to human health or the environment, OR at concentrations exceeding levels specified in policies and regulations.”<sup>45</sup> On federal lands (including First Nations reserves), contaminated sites are registered with the Federal Contaminated Sites Inventory (FCSI), maintained by the Treasury Board of Canada. Figures 5.1, 5.2 and 5.3 show the general locations of active, suspected, and closed contaminated sites respectively. Active sites are listed according to the priority for action, assigned by the FCSI based on the National Classification System for Contaminated Sites Guidance Document and considering the contaminants present, their toxicity, levels, and potential to migrate off-site, and the possibility of human and ecosystem exposure.<sup>46</sup>

- **High priority for action:** The available information indicates that action (*e.g.*, further site characterization, risk management, remediation, etc.) is required to address existing concerns. Typically, Class 1 sites show potential high concern for several factors, and measured or observed impacts have been documented.
- **Medium priority for action:** The available information indicates that there is high potential for adverse impacts, although the threat to human health and the environment is generally not imminent. Typically, for Class 2 there is no direct indication of off-site contamination; however, the potential for off-site migration tends to be rated high and therefore some action is likely required.
- **Low priority for action:** The available information indicates that the Site is currently not a high concern. However, additional investigation may be carried out to confirm the site classification.
- **Not a priority for action:** The available information indicates there is likely no significant environmental impact or human health threats. There is likely no need for action unless new information becomes available indicating greater concerns, in which case, the Site should be re-examined.
- **Insufficient information:** Although a minimum of a Phase I Environmental Site Assessment has been conducted for the site, there appears to be insufficient information to classify the Site. In this event, additional information is required to address data gaps.
- **No priority assigned:** some sites are listed as having no priority assigned at this time. Additional information may be available on the sites by contacting the FCSI directly (

Tables 5.1 to 5.6 provide available details for all the active contaminated sites currently listed with the FCSI, grouped by priority for action. An interactive map of active sites, as well as suspected sites and closed sites are provided at the Cancer and the Environment Project [web map](#).<sup>47</sup>

---

<sup>45</sup> <http://www.tbs-sct.gc.ca/fcsi-rscf/home-accueil-eng.aspx>

<sup>46</sup> Canadian Council of Ministers of the Environment. 2008. National Classification System for Contaminated Sites Guidance Document. [http://www.ccme.ca/files/Resources/csm/pn\\_1403\\_ncscs\\_guidance\\_e.pdf](http://www.ccme.ca/files/Resources/csm/pn_1403_ncscs_guidance_e.pdf)

<sup>47</sup> <http://www.arcgis.com/apps/Viewer/index.html?appid=64d79a0489e34c3ab7fb67685be19157>

Provincially, the Contaminated/Impacted Sites Program is run by the Manitoba government. Lists of sites designated as contaminated or impacted are publicly available on the program website.<sup>48</sup>

- Designated contaminated sites are those that are contaminated at a level that poses a threat to human health or safety or to the environment.
- Designated impacted sites are those that are contaminated at a level that does not currently pose such a threat, but that may pose such a threat in the future.

A spreadsheet listing all sites along with the geographic coordinates was provided on request by the Contaminated/Impacted Sites Program, allowing for mapping these sites (Figure 5.4) and the identification of First Nations communities within 50km. Table 5.7 provides details on sites currently designated as contaminated. Table 5.8 provides details on sites currently designated as impacted. An interactive map of designated contaminated and impacted sites is provided at the Cancer and the Environment Project [web map](#).<sup>49</sup>

Federally, the National Pollutant Release Inventory (NPRI) includes information on the amount of contaminants added to or removed from existing mine tailings and waste rock piles as of 2006.<sup>50</sup> No waste rock sites were noted in Manitoba. Table 5.9 lists all reported mine tailings sites. It is important to note that the amounts shown only represent additions or removals (indicated by negative numbers), not the total amount present at the site. An interactive map of mine tailing sites is provided at the Cancer and the Environment Project [web map](#).<sup>51</sup>

In all of the tables noted above, First Nations within 50km are also listed. The presence of a contaminated site within 50km of a First Nation does not indicate that contaminants are having a negative impact on the health of the community. Contaminants may not travel far from the site, and may not enter air, water or foods that the community breathes, drinks or eats. The tables are useful for identifying potential issues that may require additional information about sites of concern.

Finally, Health Canada provides guidance for conducting contaminated site risk assessments. Included in Table 5.10 is information from a guidance document<sup>52</sup> listing common contaminants found at different types of sites. This list does not confirm these pollutants are present at any specific contaminated site, but is a useful general checklist.

---

<sup>48</sup> <http://www.gov.mb.ca/conservation/envprograms/contams/index.html?print>

<sup>49</sup> <http://www.arcgis.com/apps/Viewer/index.html?appid=64d79a0489e34c3ab7fb67685be19157>

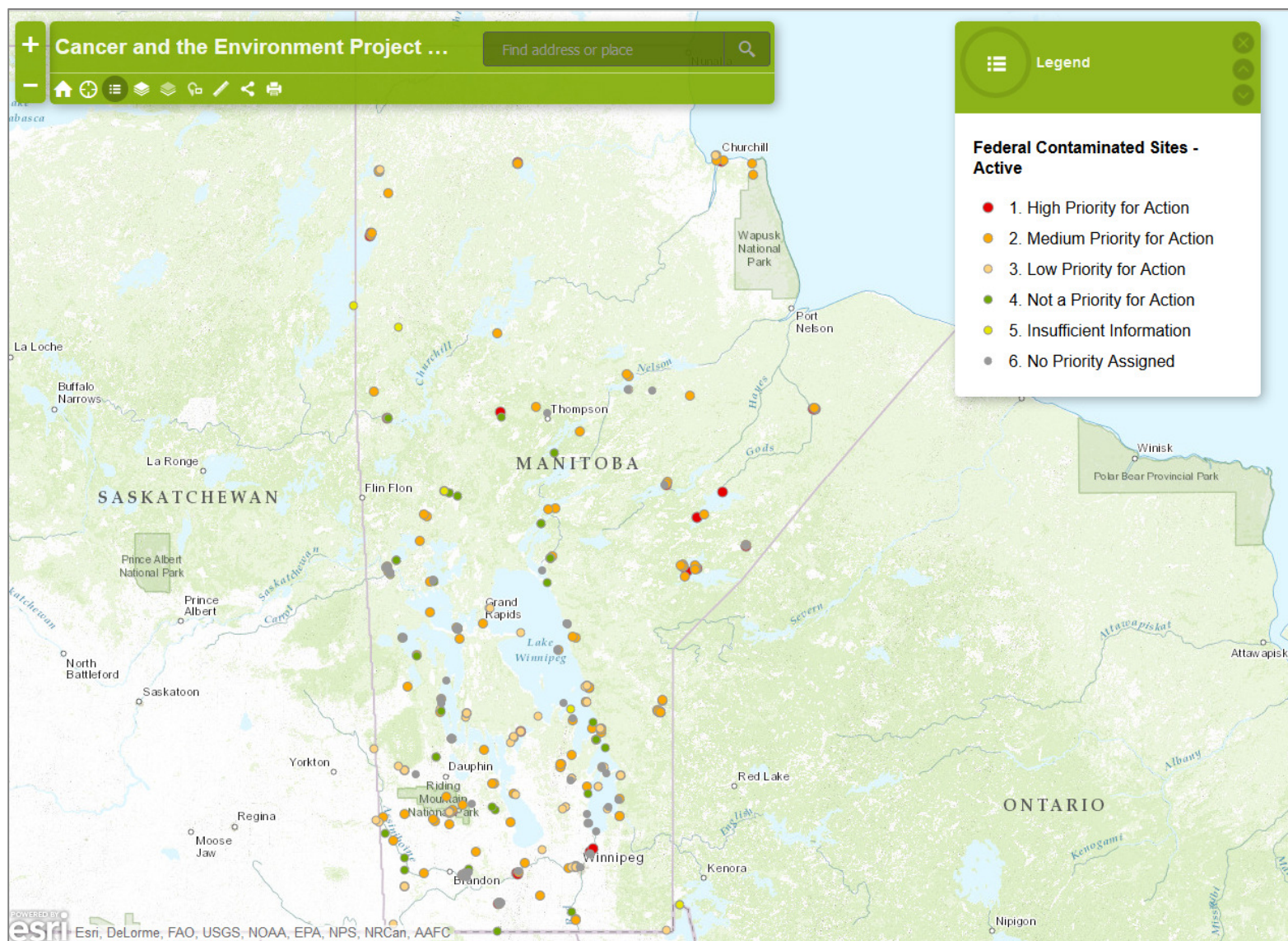
<sup>50</sup> <https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=E38E61E8-1>

<sup>51</sup> <http://www.arcgis.com/apps/Viewer/index.html?appid=64d79a0489e34c3ab7fb67685be19157>

<sup>52</sup> Health Canada. (2012). Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0 – Federal Contaminated Site Risk Assessment in Canada.

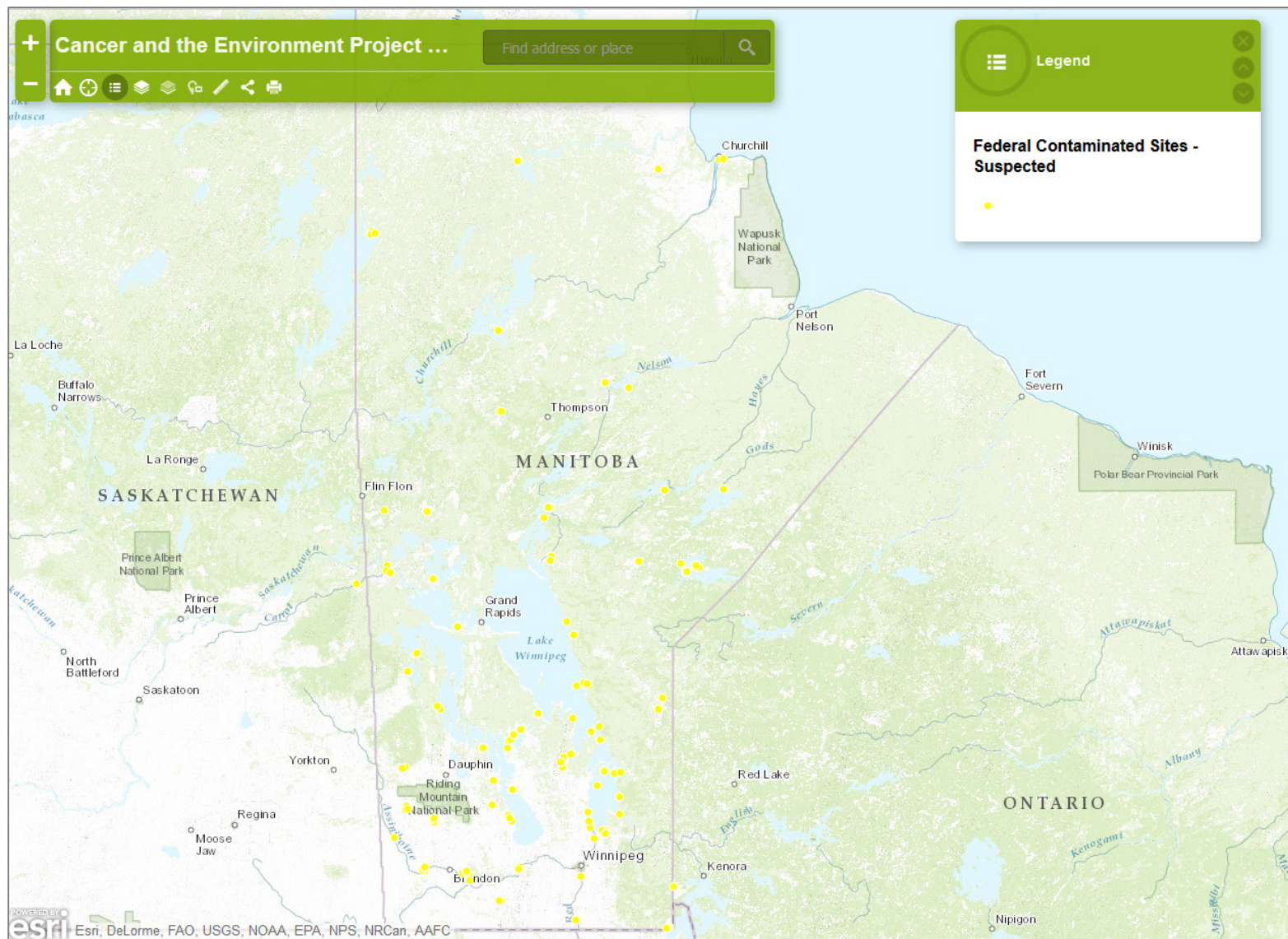


Figure 5.1 FEDERAL CONTAMINATED SITES INVENTORY – ACTIVE SITES



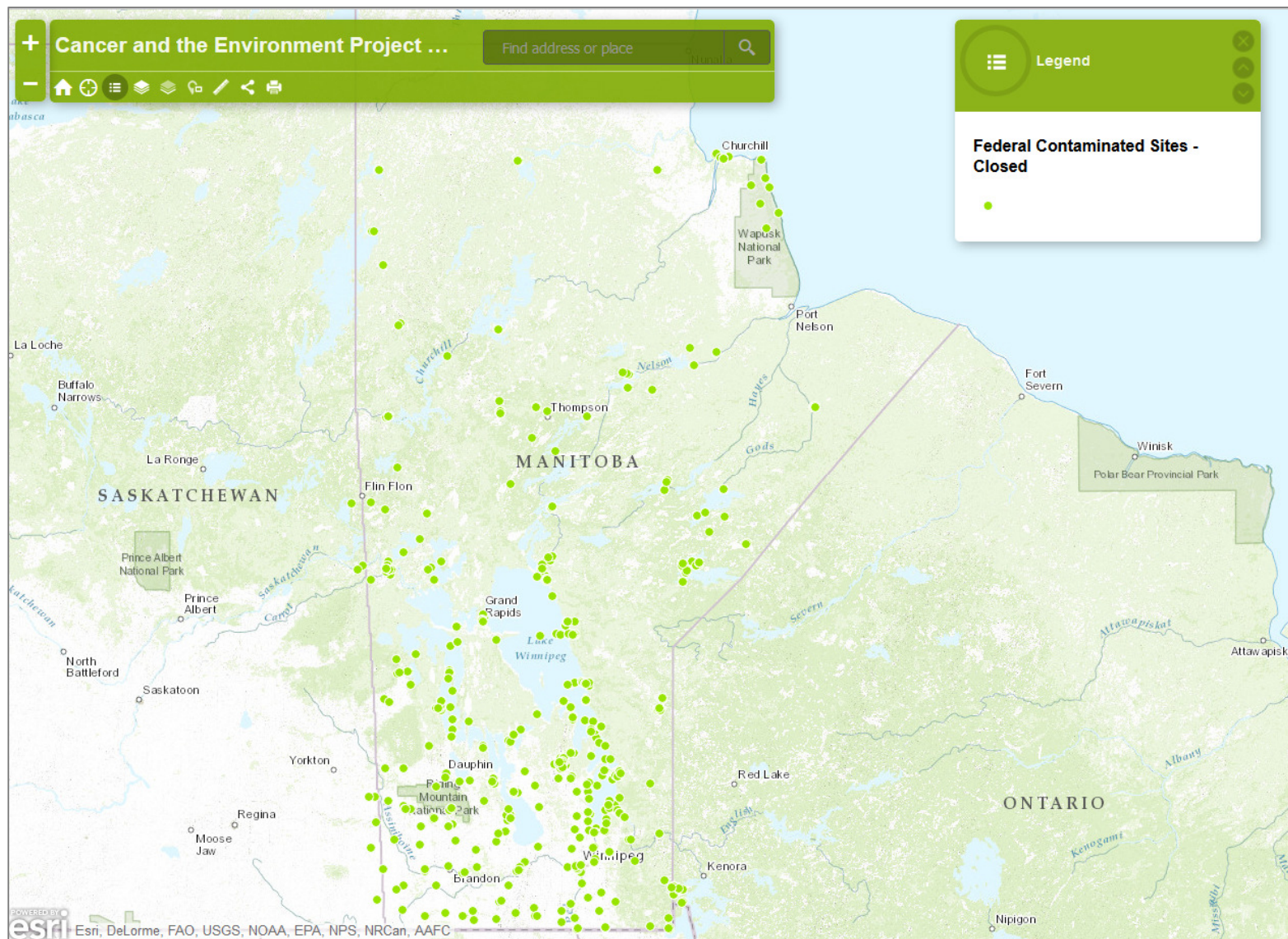


**Figure 5.2 FEDERAL CONTAMINATED SITES INVENTORY – SUSPECTED SITES**





**Figure 5.3 FEDERAL CONTAMINATED SITES INVENTORY – CLOSED SITES**



## CONTAMINATED SITES AND MINE TAILINGS

<b>Table 5.1 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – HIGH PRIORITY FOR ACTION</b>					
<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00000614	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic, Other organics	Groundwater, Soil	Dakota Plains (Less than 1 km) Dakota Tipi (17 km) Long Plain (5 km)
00005528	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Sayisi Dene First Nation (1 km)
00005542	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Sayisi Dene First Nation (Less than 1 km)
00005622	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Groundwater, Soil	Garden Hill First Nations (2 km) St. Theresa Point (16 km) Wasagamack First Nation (19 km)
00005722	Indian and Inuit Affairs	06. Reclassify the Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Groundwater, Soil, Surface soil	Red Sucker Lake (1 km)
00005805	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Soil	Garden Hill First Nations (18 km) St. Theresa Point (8 km) Wasagamack First Nation (1 km)
00006601	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Garden Hill First Nations (12 km) St. Theresa Point (11 km) Wasagamack First Nation (7 km)
00006814	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Mathias Colomb (Less than 1 km)
00006892	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	God's Lake First Nation (34 km)

## CONTAMINATED SITES AND MINE TAILINGS

Table 5.1 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – HIGH PRIORITY FOR ACTION					
Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
00006928	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Shamattawa First Nation (1 km)
00006936	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	BTEXs (benzene, toluene, ethylbenzene, and xylene), PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Garden Hill First Nations (1 km) St. Theresa Point (14 km) Wasagamack First Nation (18 km)
00006939	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Shamattawa First Nation (2 km)
00006940	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Surface soil	Shamattawa First Nation (2 km)
00006941	Indian and Inuit Affairs	04. Classify Contaminated Site	Other	Other medium	Shamattawa First Nation (2 km)
00007045	Indian and Inuit Affairs	05. Detailed Testing Program	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Groundwater, Soil	Garden Hill First Nations (12 km) St. Theresa Point (12 km) Wasagamack First Nation (7 km)
00007057	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Little Grand Rapids (3 km) Pausingassi First Nation (16 km)
00007866	Indian and Inuit Affairs	06. Reclassify the Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon)	Soil	Swan Lake (1 km)

## CONTAMINATED SITES AND MINE TAILINGS

Table 5.1 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – HIGH PRIORITY FOR ACTION					
Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
00007967	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Nisichawayasihk Cree Nation (3 km)
00007977	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Bunibonibee Cree Nation (3 km)
00007981	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Dakota Plains (Less than 1 km) Dakota Tipi (18 km) Long Plain (5 km)
00008019	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Dauphin River (34 km) Lake St. Martin (1 km) Little Saskatchewan (13 km) Pinaymootang First Nation (25 km)
00012863	Parks Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater, Surface water	Keeseekoowenin (31 km) Rolling River (23 km)
05230001	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Berens River (4 km)
05260001	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Barren Lands (4 km)
05260005	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Barren Lands (7 km)
05301001	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	God's Lake First Nation (34 km)
05302001	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	God's Lake First Nation (19 km) Manto Sipi Cree Nation (Less than 1 km)

## CONTAMINATED SITES AND MINE TAILINGS

<b>Table 5.1 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – HIGH PRIORITY FOR ACTION</b>					
<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
05310001	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Northlands (Less than 1 km)
05324001	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Red Sucker Lake (1 km)
05328001	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Groundwater, Soil	Shamattawa First Nation (3 km)
05328002	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Shamattawa First Nation (3 km)
12705001	Parks Canada	04. Classify Contaminated Site	Petroleum hydrocarbons and PAH's	Not Available	Brokenhead Ojibway Nation (35 km)
19118041	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Little Grand Rapids (6 km) Pauingassi First Nation (17 km)
53720001	Public Works and Services	07. Develop Remediation/Risk Management Strategy	Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Groundwater, Soil	Brokenhead Ojibway Nation (28 km)



**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00000453	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Bloodvein (1 km) Kinonjeoshtegon First Nation (44 km)
00000532	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Tataskweyak Cree Nation (4 km) War Lake First Nation (39 km) York Factory First Nation (16 km)
00000615	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Ebb and Flow (Less than1 km) Lake Manitoba (37 km)
00001056	Royal Canadian Mounted Police	08. Implement Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Groundwater, Soil, Surface soil	Garden Hill First Nations (Less than1 km) St. Theresa Point (13 km) Wasagamack First Nation (17 km)
00001359	Agriculture and Agri-Food Canada	06. Reclassify the Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Surface soil	Sapotaweyak Cree Nation (45 km) Wuskwi Sipiik First Nation (18 km)
00004373	Indian and Inuit Affairs	06. Reclassify the Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Mosakahiken Cree Nation (3 km)
00005606	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Berens River (4 km)
00005697	Indian and Inuit Affairs	06. Reclassify the Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Northlands (Less than1 km)
00005734	Indian and Inuit Affairs	06. Reclassify the Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Northlands (Less than1 km)



## CONTAMINATED SITES AND MINE TAILINGS

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
00005736	Indian and Inuit Affairs	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Northlands (1 km)
00005783	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Little Grand Rapids (14 km) Pauingassi First Nation (Less than 1 km)
00005785	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Bloodvein (4 km) Kinonjeoshtegon First Nation (45 km)
00005815	Indian and Inuit Affairs	06. Reclassify the Site	PHCs (petroleum hydrocarbons)	Surface soil	Garden Hill First Nations (18 km) St. Theresa Point (8 km) Wasagamack First Nation (1 km)
00005821	Indian and Inuit Affairs	05. Detailed Testing Program	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Groundwater, Surface soil	Garden Hill First Nations (18 km) St. Theresa Point (8 km) Wasagamack First Nation (1 km)
00005845	Indian and Inuit Affairs	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Chemawawin Cree Nation (16 km) Grand Rapids First Nation (39 km)
00006145	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Shamattawa First Nation (2 km)
00007031	Indian and Inuit Affairs	04. Classify Contaminated Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Groundwater, Soil, Surface soil	Garden Hill First Nations (2 km) St. Theresa Point (14 km) Wasagamack First Nation (18 km)
00007053	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil, Surface soil	Little Grand Rapids (3 km) Pauingassi First Nation (16 km)

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00007102	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Surface soil	Bunibonibee Cree Nation (2 km)
00007155	Indian and Inuit Affairs	06. Reclassify the Site	PHCs (petroleum hydrocarbons)	Soil	Pine Creek (42 km) Skownan First Nation (3 km)
00007168	Indian and Inuit Affairs	06. Reclassify the Site	PHCs (petroleum hydrocarbons)	Surface soil	Mathias Colomb (41 km)
00007651	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Barren Lands (6 km)
00007675	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Surface soil	Swan Lake (Less than 1 km)
00007754	Indian and Inuit Affairs	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Other medium	Hollow Water (Less than 1 km) Little Black River (37 km)
00007800	Indian and Inuit Affairs	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon)	Soil	Little Grand Rapids (1 km) Pauingassi First Nation (15 km)
00007898	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	Other	Not Available	Sayisi Dene First Nation (1 km)
00007901	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Dauphin River (48 km) Lake St. Martin (13 km) Little Saskatchewan (1 km) O-Chi-Chak-Ko-Sipi First Nation (47 km) Pinaymootang First Nation (10 km)
00007906	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Keeseekoowenin (24 km) Rolling River (3 km)
00007908	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	Other	Soil	Barren Lands (6 km)

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00007916	Indian and Inuit Affairs	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Garden Hill First Nations (17 km) St. Theresa Point (7 km) Wasagamack First Nation (1 km)
00007917	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Little Saskatchewan (49 km) O-Chi-Chak-Ko-Sipi First Nation (1 km) Pinaymootang First Nation (38 km)
00007920	Indian and Inuit Affairs	04. Classify Contaminated Site	Other	Groundwater	Berens River (1 km)
00007921	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Groundwater	Bloodvein (Less than 1 km) Kinonjeoshtegon First Nation (44 km)
00007922	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Bloodvein (Less than 1 km) Kinonjeoshtegon First Nation (44 km)
00007923	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Fort Alexander (25 km) Hollow Water (36 km) Little Black River (1 km)
00007924	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Little Grand Rapids (15 km) Paungassi First Nation (Less than 1 km)
00007925	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Poplar River First Nation (3 km)
00007926	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Brokenhead Ojibway Nation (36 km) Fort Alexander (3 km) Little Black River (24 km)
00007927	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Birdtail Sioux (Less than 1 km) Gamblers (39 km) Waywayseecappo First Nation Treaty Four - 1874 (48 km)
00007930	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Cross Lake First Nation (4 km)

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00007931	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Cross Lake First Nation (4 km)
00007932	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Lake Manitoba (42 km) Sandy Bay (2 km)
00007947	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Mosakahiken Cree Nation (1 km)
00007969	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Birdtail Sioux (40 km) Gamblers (1 km) Waywayseecappo First Nation Treaty Four - 1874 (34 km)
00007970	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Keeseekoowenin (1 km) Rolling River (20 km) Waywayseecappo First Nation Treaty Four - 1874 (48 km)
00007975	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Fox Lake (35 km) War Lake First Nation (49 km)
00007976	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Norway House Cree Nation (5 km)
00007979	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Bunibonibee Cree Nation (Less than 1 km)
00007987	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Sapotaweyak Cree Nation (1 km) Wuskwi Sipiik First Nation (29 km)
00007989	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Chemawawin Cree Nation (1 km) Grand Rapids First Nation (35 km)
00007991	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Dakota Plains (19 km) Dakota Tipi (2 km) Long Plain (14 km)
00007995	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Nisichawayasihk Cree Nation (47 km)
00007997	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Shamattawa First Nation (3 km)

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00008001	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Roseau River Anishinabe First Nation Government (3 km)
00008003	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Canupawakpa Dakota First Nation (49 km) Sioux Valley Dakota Nation (4 km)
00008004	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Dakota Plains (2 km) Dakota Tipi (15 km) Long Plain (3 km)
00008006	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Roseau River Anishinabe First Nation Government (1 km)
00008009	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Garden Hill First Nations (17 km) St. Theresa Point (19 km) Wasagamack First Nation (13 km)
00008024	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Ebb and Flow (2 km) Lake Manitoba (39 km)
00008027	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Garden Hill First Nations (5 km) St. Theresa Point (11 km) Wasagamack First Nation (16 km)
00008034	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Bloodvein (43 km) Kinonjeoshtegon First Nation (1 km)
00008036	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Tootinaowaziibeeng Treaty Reserve (2 km)
00008047	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Tataskweyak Cree Nation (3 km) War Lake First Nation (43 km) York Factory First Nation (20 km)
00008048	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Pine Creek (6 km) Skownan First Nation (39 km)

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00008053	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Brokenhead Ojibway Nation (36 km) Fort Alexander (3 km) Little Black River (24 km)
00008055	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Birdtail Sioux (44 km) Gamblers (31 km) Keeseekoowenin (46 km) Waywayseecappo First Nation Treaty Four - 1874 (4 km)
00008063	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Little Grand Rapids (5 km) Pauingassi First Nation (17 km)
00008068	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Canupawakpa Dakota First Nation (39 km) Sioux Valley Dakota Nation (40 km)
00008070	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Fisher River (1 km) Peguis (24 km)
00008078	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Swan Lake (Less than 1 km)
00008173	Indian and Inuit Affairs	04. Classify Contaminated Site	Other organics	Surface soil	Chemawawin Cree Nation (43 km) Mosakahiken Cree Nation (42 km)
00008174	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon)	Soil	Chemawawin Cree Nation (1 km) Grand Rapids First Nation (35 km)
00008177	Indian and Inuit Affairs	04. Classify Contaminated Site	BTEXs (benzene, toluene, ethylbenzene, and xylene)	Soil	Chemawawin Cree Nation (1 km) Grand Rapids First Nation (35 km)
00008179	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Groundwater	Chemawawin Cree Nation (Less than 1 km) Grand Rapids First Nation (36 km)

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00008223	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Chemawawin Cree Nation (1 km) Grand Rapids First Nation (35 km)
00012696	Fisheries and Oceans Canada	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Pine Creek (13 km) Skownan First Nation (44 km)
00012701	Fisheries and Oceans Canada	05. Detailed Testing Program	BTEXs (benzene, toluene, ethylbenzene, and xylene)	Soil	Chemawawin Cree Nation (39 km) Grand Rapids First Nation (2 km)
00012736	Fisheries and Oceans Canada	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Bloodvein (17 km) Fisher River (44 km) Kinonjeoshtegon First Nation (45 km)
00012743	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic, Petroleum hydrocarbons and PAH's	Sediment, Soil	Norway House Cree Nation (2 km)
00012760	Fisheries and Oceans Canada	06. Reclassify the Site	PHCs (petroleum hydrocarbons)	Soil	Sapotaweyak Cree Nation (32 km)
00015276	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Bloodvein (12 km) Kinonjeoshtegon First Nation (32 km)
00015287	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Berens River (24 km) Bloodvein (45 km) Kinonjeoshtegon First Nation (32 km)
00022383	Royal Canadian Mounted Police	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	God's Lake First Nation (25 km) Manto Sipi Cree Nation (41 km)
00022630	Royal Canadian Mounted Police	04. Classify Contaminated Site	BTEXs (benzene, toluene, ethylbenzene, and xylene)	Soil	Northlands (1 km)
00022670	Royal Canadian Mounted Police	04. Classify Contaminated Site	BTEXs (benzene, toluene, ethylbenzene, and xylene)	Soil	Northlands (30 km)

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00023110	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Sediment	Hollow Water (30 km)
00023140	Fisheries and Oceans Canada	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Berens River (24 km) Bloodvein (45 km) Kinonjeoshtegon First Nation (32 km)
00023456	Parks Canada	08. Implement Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Rolling River (39 km)
00025781	Parks Canada	04. Classify Contaminated Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Air, Groundwater, Soil	Keeseekoowenin (26 km) Rolling River (19 km)
05290001	Indian and Inuit Affairs	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Ebb and Flow (34 km) Lake Manitoba (3 km) Sandy Bay (40 km)
05306003	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Soil	Garden Hill First Nations (21 km) St. Theresa Point (10 km) Wasagamack First Nation (4 km)
05306007	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil, Surface soil	Garden Hill First Nations (19 km) St. Theresa Point (7 km) Wasagamack First Nation (3 km)



## CONTAMINATED SITES AND MINE TAILINGS

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
05309002	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Keeseekoowenin (1 km) Rolling River (24 km) Waywayseecappo First Nation Treaty Four - 1874 (45 km)
05311001	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Little Grand Rapids (6 km)
05311001	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Pauingassi First Nation (17 km)
05317002	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Opaskwayak Cree Nation (8 km)
05317005	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Opaskwayak Cree Nation (9 km)
05317006	Indian and Inuit Affairs	05. Detailed Testing Program	Metal, metalloid, and organometallic, Nuisance substances, Other, Other Physical/Chemical (pH, temperature, dissolved solids, turbidity, etc.), Toxic organics	Groundwater, Soil	Opaskwayak Cree Nation (8 km)
05317012	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	Nuisance substances, Other	Surface soil	Opaskwayak Cree Nation (3 km)
05321001	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil, Surface soil	Fisher River (20 km) Peguis (3 km)

**Table 5.2 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES - MEDIUM PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
05321003	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Fisher River (19 km) Peguis (4 km)
05321004	Indian and Inuit Affairs	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil, Surface soil	Fisher River (23 km) Peguis (2 km)
05322001	Indian and Inuit Affairs	06. Reclassify the Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Other medium	Poplar River First Nation (1 km)
05324002	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater, Surface water	Red Sucker Lake (1 km)
12897001	Parks Canada	04. Classify Contaminated Site	Nuisance substances	Not Available	Keeseekoowenin (31 km) Rolling River (24 km)
12897002	Parks Canada	08. Implement Remediation/Risk Management Strategy	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Soil	Keeseekoowenin (27 km)  Rolling River (20 km)
12897006	Parks Canada	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Groundwater, Soil	Keeseekoowenin (39 km) Rolling River (43 km)
12897007	Parks Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Soil	Keeseekoowenin (26 km) Rolling River (19 km)
19118094	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Swan Lake (Less than 1 km)
29789001	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Poplar River First Nation (30 km)

**Table 5.3 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – LOW PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00000440	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Surface soil	Lake St. Martin (1 km) Little Saskatchewan (12 km) Pinaymootang First Nation (24 km) Dauphin River (34 km)
00001363	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Surface soil	Gamblers (10 km) Birdtail Sioux (37 km) Waywayseecappo First Nation Treaty Four - 1874 (43 km)
00001403	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Groundwater	Gamblers (12 km) Birdtail Sioux (41 km) Waywayseecappo First Nation Treaty Four - 1874 (45 km)
00001437	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Peguis (25 km) Fisher River (35 km)
00001438	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Peguis (25 km) Fisher River (35 km)
00001440	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Peguis (25 km) Fisher River (35 km)
00001441	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Peguis (25 km) Fisher River (35 km)
00004342	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Mathias Colomb (1 km)
00005669	Indian and Inuit Affairs	04. Classify Contaminated Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Groundwater, Soil, Surface soil	Pine Creek (2 km) Skownan First Nation (39 km)
00006373	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Buffalo Point First Nation (44 km)

**Table 5.3 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – LOW PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00007919	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Berens River (1 km)
00007929	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Northlands (2 km)
00007938	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Skownan First Nation (2 km) Pine Creek (43 km)
00007939	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Skownan First Nation (4 km) Pine Creek (42 km)
00007968	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Swan Lake (Less than1 km)
00007999	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Buffalo Point First Nation (1 km)
00008015	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Pinaymootang First Nation (3 km) Little Saskatchewan (10 km) Lake St. Martin (21 km) O-Chi-Chak-Ko-Sipi First Nation (41 km)
00008017	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Lake Manitoba (Less than1 km) Ebb and Flow (37 km) Sandy Bay (39 km)
00008062	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Surface water	Little Saskatchewan (Less than1 km) Lake St. Martin (11 km) Pinaymootang First Nation (12 km) Dauphin River (46 km) O-Chi-Chak-Ko-Sipi First Nation (49 km)
00008067	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Canupawakpa Dakota First Nation (39 km) Sioux Valley Dakota Nation (40 km)

**Table 5.3 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – LOW PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00008180	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Swan Lake (Less than1 km)
00008195	Indian and Inuit Affairs	04. Classify Contaminated Site	Other organics	Groundwater	Swan Lake (Less than1 km)
00009075	Environment Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon)	Sediment, Surface water	Fort Alexander (18 km) Little Black River (22 km) Brokenhead Ojibway Nation (39 km)
00012727	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon)	Soil	Skownan First Nation (40 km) Pine Creek (49 km)
00015274	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Sediment	Berens River (Less than1 km)
00015382	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Sediment	Dauphin River (1 km) Lake St. Martin (35 km) Little Saskatchewan (47 km)
00024313	Fisheries and Oceans Canada	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Bloodvein (17 km) Fisher River (44 km) Kinonjeoshtegon First Nation (45 km)
00024381	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon)	Sediment	Skownan First Nation (40 km) Pine Creek (49 km)
05304001	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Hollow Water (Less than1 km) Little Black River (37 km)

**Table 5.3 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – LOW PRIORITY FOR ACTION**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
05317015	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic, Other Physical/Chemical (pH, temperature, dissolved solids, turbidity, etc.), PHCs (petroleum hydrocarbons)	Groundwater, Surface soil, Surface water	Opaskwayak Cree Nation (8 km)
05332002	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil, Surface soil	Tootinaowaziibeeng Treaty Reserve (Less than 1 km)
19118092	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Chemawawin Cree Nation (1 km) Grand Rapids First Nation (35 km)
19118095	Indian and Inuit Affairs	04. Classify Contaminated Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Groundwater	Swan Lake (Less than 1 km)
83578001	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Grand Rapids First Nation (23 km)
83604001	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Grand Rapids First Nation (24 km)
00013050	Fisheries and Oceans Canada	05. Detailed Testing Program	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Skownan First Nation (40 km) Pine Creek (49 km)
00001357	Agriculture and Agri-Food Canada	06. Reclassify the Site	PHCs (petroleum hydrocarbons)	Soil	Tootinaowaziibeeng Treaty Reserve (9 km)
00001358	Agriculture and Agri-Food Canada	06. Reclassify the Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Soil	Dakota Tipi (36 km) Long Plain (48 km)

**Table 5.3 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – LOW PRIORITY FOR ACTION**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
00004380	Indian and Inuit Affairs	06. Reclassify the Site	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Groundwater, Soil	Mathias Colomb (2 km)
00004411	Indian and Inuit Affairs	06. Reclassify the Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	York Factory First Nation (3 km) Tataskweyak Cree Nation (21 km) War Lake First Nation (32 km)
00015278	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Bloodvein (1 km) Kinonjeoshtegon First Nation (42 km)
00015283	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon)	Soil	Berens River (24 km) Kinonjeoshtegon First Nation (32 km) Bloodvein (45 km)
00015297	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Hollow Water (26 km)
00015317	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Little Black River (36 km) Hollow Water (37 km)
00015318	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Little Black River (36 km) Hollow Water (37 km)
00015356	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Brokenhead Ojibway Nation (37 km)
00015376	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Skownan First Nation (40 km) Pine Creek (49 km)
00015377	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Skownan First Nation (40 km) O-Chi-Chak-Ko-Sipi First Nation (49 km)
07622106	Environment Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Not Available	Opaskwayak Cree Nation (19 km)
12897003	Parks Canada	06. Reclassify the Site	Petroleum hydrocarbons and PAH's	Not Available	Rolling River (19 km) Keeseekoowenin (25 km)

**Table 5.3 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – LOW PRIORITY FOR ACTION**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
05230002	Indian and Inuit Affairs	07. Develop Remediation/Risk Management Strategy	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Berens River (1 km)
05317011	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	BTEXs (benzene, toluene, ethylbenzene, and xylene), PHCs (petroleum hydrocarbons)	Groundwater, Soil	Opaskwayak Cree Nation (7 km)

**Table 5.4 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – INSUFFICIENT INFORMATION TO ASSIGN PRIORITY**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
05316002	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Soil	Opaskwayak Cree Nation (2 km)
05316003	Indian and Inuit Affairs	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Opaskwayak Cree Nation (2 km)
00006293	Indian and Inuit Affairs	05. Detailed Testing Program	PHCs (petroleum hydrocarbons)	Soil	Buffalo Point First Nation (44 km)
00015363	Fisheries and Oceans Canada	06. Reclassify the Site	PAHs (polycyclic aromatic hydrocarbon)	Soil	Kinonjeoshtegon First Nation (16 km) Berens River (40 km) Dauphin River (49 km)



**Table 5.5 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – NOT A PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00001364	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Surface soil	Birdtail Sioux (31 km) Sioux Valley Dakota Nation (36 km)
00001850	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Sandy Bay (27 km) Lake Manitoba (39 km) Ebb and Flow (40 km)
00001897	Agriculture and Agri-Food Canada	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Sandy Bay (33 km) Ebb and Flow (35 km) Lake Manitoba (40 km)
00007610	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Nisichawayasihk Cree Nation (3 km)
00007935	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Mathias Colomb (2 km)
00008176	Indian and Inuit Affairs	04. Classify Contaminated Site	PHCs (petroleum hydrocarbons)	Soil	Chemawawin Cree Nation (1 km) Grand Rapids First Nation (35 km)
00008207	Indian and Inuit Affairs	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Groundwater	Opaskwayak Cree Nation (7 km)
00008860	Environment Canada	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Sediment	Skownan First Nation (41 km) Pine Creek (49 km)
00012707	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic, Other Physical/Chemical (pH, temperature, dissolved solids, turbidity, etc.)	Groundwater, Soil	Little Black River (47 km)
00012740	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Sediment	Bloodvein (15 km) Kinonjeoshtegon First Nation (30 km)
00012746	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Sediment	Roseau River Anishinabe First Nation Government (13 km)

**Table 5.5 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – NOT A PRIORITY FOR ACTION**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
00023111	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Sediment	Bloodvein (17 km) Fisher River (44 km) Kinonjeoshtegon First Nation (45 km)
00024330	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Soil	Pine Creek (5 km) Skownan First Nation (37 km)
00024331	Fisheries and Oceans Canada	04. Classify Contaminated Site	PAHs (polycyclic aromatic hydrocarbon)	Sediment, Soil	Sapotaweyak Cree Nation (1 km) Wuskwi Sipiik First Nation (29 km)
00024423	Fisheries and Oceans Canada	04. Classify Contaminated Site	Metal, metalloid, and organometallic	Sediment	Norway House Cree Nation (2 km)
19118098	Indian and Inuit Affairs	04. Classify Contaminated Site	Other Physical/Chemical (pH, temperature, dissolved solids, turbidity, etc.)	Soil	Swan Lake (Less than 1 km)
00011440	Environment Canada	06. Reclassify the Site	BTEXs (benzene, toluene, ethylbenzene, and xylene)	Groundwater	Opaskwayak Cree Nation (19 km)
00011441	Environment Canada	06. Reclassify the Site	Metal, metalloid, and organometallic, Other inorganics	Groundwater	Opaskwayak Cree Nation (19 km)
00011442	Environment Canada	06. Reclassify the Site	BTEXs (benzene, toluene, ethylbenzene, and xylene), Metal, metalloid, and organometallic, Other inorganics	Groundwater	Opaskwayak Cree Nation (19 km)
00015326	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Bloodvein (28 km) Hollow Water (47 km)
00015366	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Soil	Brokenhead Ojibway Nation (31 km) Fort Alexander (46 km)
00022359	Royal Canadian Mounted Police	06. Reclassify the Site	PHCs (petroleum hydrocarbons)	Groundwater, Soil	Sioux Valley Dakota Nation (31 km) Birdtail Sioux (48 km)

**Table 5.5 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – NOT A PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00022994	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon)	Sediment	Cross Lake First Nation (25 km)
00023112	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Sediment	Sapotaweyak Cree Nation (32 km)
00023120	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic	Sediment	Mosakahiken Cree Nation (1 km)
00023122	Fisheries and Oceans Canada	06. Reclassify the Site	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Sediment	Norway House Cree Nation (33 km)
05317009	Indian and Inuit Affairs	06. Reclassify the Site	Metal, metalloid, and organometallic, Other Physical/Chemical (pH, temperature, dissolved solids, turbidity, etc.), PHCs (petroleum hydrocarbons)	Groundwater, Surface soil	Opaskwayak Cree Nation (8 km)
00012802	Fisheries and Oceans Canada	07. Develop Remediation/Risk Management Strategy	Metal, metalloid, and organometallic	Sediment	Cross Lake First Nation (25 km)
00022993	Fisheries and Oceans Canada	07. Develop Remediation/Risk Management Strategy	Metal, metalloid, and organometallic	Soil	Cross Lake First Nation (25 km)
05317004	Indian and Inuit Affairs	08. Implement Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Groundwater, Soil, Surface soil	Opaskwayak Cree Nation (7 km)
12362001	Border Services Agency	08. Implement Remediation/Risk Management Strategy	PHCs (petroleum hydrocarbons)	Soil	Swan Lake (43 km)

**Table 5.5 ACTIVE FEDERAL CONTAMINATED SITES within 50KM OF FIRST NATIONS RESERVES – NOT A PRIORITY FOR ACTION**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
12785002	Agriculture and Agri-Food Canada	09. Confirmatory Sampling and Final Reporting	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Birdtail Sioux (17 km) Gamblers (25 km) Waywayseecappo First Nation Treaty Four - 1874 (45 km)

**Table 5.6 ACTIVE FEDERAL CONTAMINATED SITES – PRIORITY NOT ASSIGNED**

<b>Federal Site ID</b>	<b>Agency</b>	<b>Highest Step Completed</b>	<b>Contaminants</b>	<b>Medium</b>	<b>Communities within 50km (distance)</b>
00000454	Indian and Inuit Affairs	03. Initial Testing Program	BTEXs (benzene, toluene, ethylbenzene, and xylene), Metal, metalloid, and organometallic, PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Opaskwayak Cree Nation (Less than 1 km)
00000592	Indian and Inuit Affairs	03. Initial Testing Program	PHCs (petroleum hydrocarbons)	Surface soil	Bunibonibee Cree Nation (5 km)
00001862	Agriculture and Agri-Food Canada	03. Initial Testing Program	PHCs (petroleum hydrocarbons)	Soil	Peguis (28 km) Fisher River (38 km)
00004383	Indian and Inuit Affairs	03. Initial Testing Program	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Chemawawin Cree Nation (2 km) Grand Rapids First Nation (35 km)
00004424	Indian and Inuit Affairs	03. Initial Testing Program	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Swan Lake (3 km)
00005696	Indian and Inuit Affairs	03. Initial Testing Program	PHCs (petroleum hydrocarbons)	Soil	Kinonjeoshtegon First Nation (1 km) Bloodvein (45 km)
00005763	Indian and Inuit Affairs	03. Initial Testing Program			Little Black River (Less than 1 km) Fort Alexander (25 km) Hollow Water (37 km)
00007909	Indian and Inuit Affairs	03. Initial Testing Program	Metal, metalloid, and organometallic	Groundwater	Red Sucker Lake (Less than 1 km)
00007928	Indian and Inuit Affairs	03. Initial Testing Program			York Factory First Nation (4 km) Tataskweyak Cree Nation (21 km) War Lake First Nation (34 km)
00008069	Indian and Inuit Affairs	03. Initial Testing Program	Metal, metalloid, and organometallic	Groundwater	Chemawawin Cree Nation (1 km) Grand Rapids First Nation (35 km)

## CONTAMINATED SITES AND MINE TAILINGS

**Table 5.6 ACTIVE FEDERAL CONTAMINATED SITES – PRIORITY NOT ASSIGNED**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
00008175	Indian and Inuit Affairs	03. Initial Testing Program	PHCs (petroleum hydrocarbons)	Soil	Chemawawin Cree Nation (1 km) Grand Rapids First Nation (35 km)
00008193	Indian and Inuit Affairs	03. Initial Testing Program	Metal, metalloid, and organometallic	Groundwater	Swan Lake (Less than 1 km)
00012719	Fisheries and Oceans Canada	03. Initial Testing Program	PHCs (petroleum hydrocarbons)	Soil	Hollow Water (30 km)
00012738	Fisheries and Oceans Canada	03. Initial Testing Program	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil	Norway House Cree Nation (18 km)
00012755	Fisheries and Oceans Canada	03. Initial Testing Program	PHCs (petroleum hydrocarbons)	Soil	Fort Alexander (19 km) Little Black River (19 km) Brokenhead Ojibway Nation (42 km)
00015295	Fisheries and Oceans Canada	03. Initial Testing Program			Sapotaweyak Cree Nation (31 km)
00015296	Fisheries and Oceans Canada	03. Initial Testing Program			Sapotaweyak Cree Nation (31 km)
00015300	Fisheries and Oceans Canada	03. Initial Testing Program			Pine Creek (42 km)
00015307	Fisheries and Oceans Canada	03. Initial Testing Program			Poplar River First Nation (30 km)
00015308	Fisheries and Oceans Canada	03. Initial Testing Program			Poplar River First Nation (30 km)
00015311	Fisheries and Oceans Canada	03. Initial Testing Program			Pine Creek (8 km) Skownan First Nation (42 km)
00015312	Fisheries and Oceans Canada	03. Initial Testing Program			Pine Creek (8 km) Skownan First Nation (42 km)
00015335	Fisheries and Oceans Canada	03. Initial Testing Program	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Soil	Poplar River First Nation (21 km)
00015336	Fisheries and Oceans Canada	03. Initial Testing Program	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Soil	Poplar River First Nation (21 km)

## CONTAMINATED SITES AND MINE TAILINGS

**Table 5.6 ACTIVE FEDERAL CONTAMINATED SITES – PRIORITY NOT ASSIGNED**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
00015337	Fisheries and Oceans Canada	03. Initial Testing Program	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Soil	Poplar River First Nation (21 km)
00015338	Fisheries and Oceans Canada	03. Initial Testing Program	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Soil	Poplar River First Nation (20 km)
00015347	Fisheries and Oceans Canada	03. Initial Testing Program	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Soil	Brokenhead Ojibway Nation (15 km) Fort Alexander (40 km)
00015355	Fisheries and Oceans Canada	03. Initial Testing Program	Metal, metalloid, and organometallic	Soil	Brokenhead Ojibway Nation (37 km)
00015367	Fisheries and Oceans Canada	03. Initial Testing Program			Brokenhead Ojibway Nation (31 km) Fort Alexander (45 km)
00015368	Fisheries and Oceans Canada	03. Initial Testing Program			Brokenhead Ojibway Nation (31 km) Fort Alexander (45 km)
00015369	Fisheries and Oceans Canada	03. Initial Testing Program			Brokenhead Ojibway Nation (31 km) Fort Alexander (46 km)
00015378	Fisheries and Oceans Canada	03. Initial Testing Program	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Soil	Skownan First Nation (40 km) Pine Creek (49 km)
00015387	Fisheries and Oceans Canada	03. Initial Testing Program			Hollow Water (22 km) Little Black River (43 km)
00016650	Fisheries and Oceans Canada	03. Initial Testing Program	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Sediment, Soil	Kinonjeoshtegon First Nation (28 km) Berens River (41 km) Dauphin River (42 km)
00022382	Royal Canadian Mounted Police	03. Initial Testing Program			Opaskwayak Cree Nation (Less than 1 km)
00022391	Royal Canadian Mounted Police	03. Initial Testing Program			Brokenhead Ojibway Nation (42 km) Fort Alexander (46 km)
00022423	Royal Canadian Mounted Police	03. Initial Testing Program			Ebb and Flow (45 km) Rolling River (48 km)

## CONTAMINATED SITES AND MINE TAILINGS

**Table 5.6 ACTIVE FEDERAL CONTAMINATED SITES – PRIORITY NOT ASSIGNED**

Federal Site ID	Agency	Highest Step Completed	Contaminants	Medium	Communities within 50km (distance)
00022431	Royal Canadian Mounted Police	03. Initial Testing Program			Tootinaowaziibeeng Treaty Reserve (18 km)
00022671	Royal Canadian Mounted Police	03. Initial Testing Program			Mosakahiken Cree Nation (1 km)
00023097	Fisheries and Oceans Canada	03. Initial Testing Program	Metal, metalloid, and organometallic, PHCs (petroleum hydrocarbons)	Sediment	Pine Creek (13 km) Skownan First Nation (44 km)
00025825	Indian and Inuit Affairs	03. Initial Testing Program	PAHs (polycyclic aromatic hydrocarbon)	Surface soil	Swan Lake (Less than1 km)
05305001	Indian and Inuit Affairs	03. Initial Testing Program	Nuisance substances	Soil	War Lake First Nation (3 km) York Factory First Nation (29 km) Tataskweyak Cree Nation (39 km)
05313003	Indian and Inuit Affairs	03. Initial Testing Program	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Soil, Surface soil	Long Plain (1 km) Dakota Plains (4 km) Dakota Tipi (13 km)
05316005	Indian and Inuit Affairs	03. Initial Testing Program	PAHs (polycyclic aromatic hydrocarbon), PHCs (petroleum hydrocarbons)	Surface soil	Opaskwayak Cree Nation (1 km)
05317008	Indian and Inuit Affairs	03. Initial Testing Program	PHCs (petroleum hydrocarbons)	Soil, Surface soil	Opaskwayak Cree Nation (2 km)
05317019	Indian and Inuit Affairs	03. Initial Testing Program	Nuisance substances, Other, Toxic organics	Groundwater, Surface soil	Opaskwayak Cree Nation (8 km)
19118093	Indian and Inuit Affairs	03. Initial Testing Program	Other organics	Groundwater	Swan Lake (Less than1 km)
19118099	Indian and Inuit Affairs	03. Initial Testing Program	PHCs (petroleum hydrocarbons)	Soil	Swan Lake (Less than1 km)



Figure 5.4 PROVINCIAL DESIGNATED CONTAMINATED and IMPACTED SITES MAP

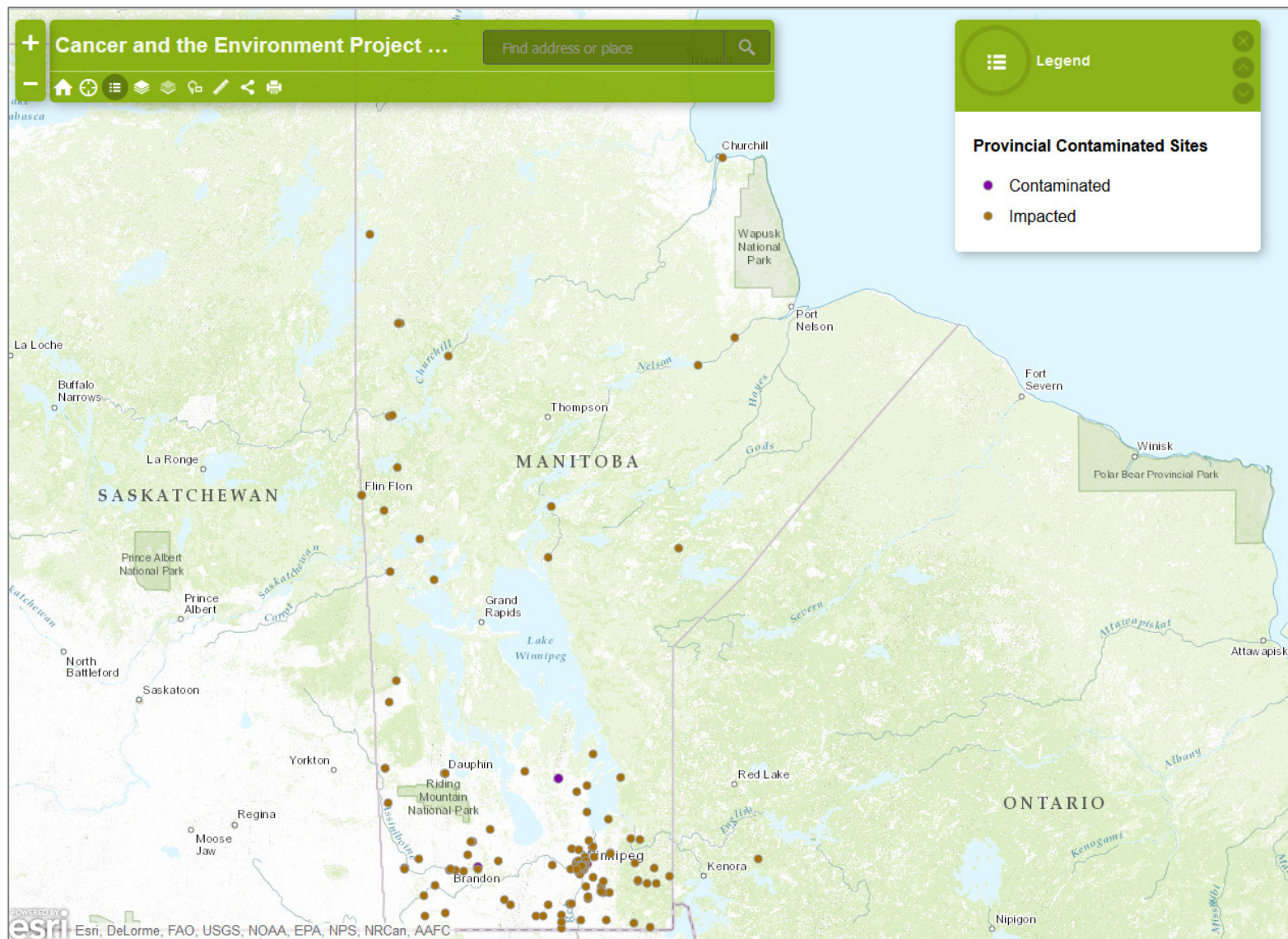


Table 5.7 PROVINCIAL DESIGNATED CONTAMINATED SITES					
File	Site Name	City	Address	Communities within 50 km	Distance
19309	CYPRESS-AGRI SERVICES	CARBERRY	411 - 1ST. AVE. E.		
19727	FORMER MEILLEUR'S ESSO	FISHER BRANCH	TACHE ST. AT ELDERBERRY BAY	Fisher River	42
				Peguis	22
20114	DOMTAR INC. - TRANSCONA	WINNIPEG	GUNN RD. AT DAY ST.		
20164	NORTH WEST SMELTING AND REFINING LTD.	WINNIPEG	2185 LOGAN AVE		
20861	CENTRA-GAS MANITOBA	WINNIPEG	35 SUTHERLAND AVE.		

## CONTAMINATED SITES AND MINE TAILINGS

<b>Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES</b>					
<b>File</b>	<b>Site Name</b>	<b>City</b>	<b>Address</b>	<b>Communities within 50 km</b>	<b>Distance</b>
59283	WAIL INVESTMENTS LTD	ALTONA	207 CENTRE AVENUE	Roseau River Anishinabe First Nation Government	21
19433	ARBORG CO-OP - 328 MAIN ST (FORMER BULK PLANT)	ARBORG	328 MAIN ST	Peguis	49
19505	IMPERIAL OIL RETAIL - ASHERN (FORMER)	ASHERN	HWY 6	Ebb and Flow	48
				Lake Manitoba	34
54326	BEAUSEJOUR CONSUMER'S CO-OP BULK	BEAUSEJOUR	1046 SELCH AVE	Brokenhead Ojibway Nation	31
58738	MANITOBA TRANSPORTATION AND INFRASTRUCTURE - BEAUSEJOUR	BEAUSEJOUR	HWY 302, NE 36-12-7E	Brokenhead Ojibway Nation	32
21005	SHELL CANADA BULK - BIRCH RIVER	BIRCH RIVER	300 LORNE AVE N	Sapotaweyak Cree Nation	47
				Wuskwi Sipihk First Nation	20
58736	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - BIRDS HILL YARD	BIRDS HILL PROV. PARK	NE 16-12-5E	Brokenhead Ojibway Nation	40
19360	GRANNY'S POULTRY CO-OP (MB) LTD	BLUMENORT	4 PENNER DR, NE 06-07-27 E		
19268	BOISSEVAIN CONSUMERS CO-OP LTD	BOISSEVAIN	518 STEPHEN ST S (ALSO 470 STEPHEN ST)	Canupawakpa Dakota First Nation	39
19087	CANADIAN TIRE - BRANDON	BRANDON	1655 18TH ST S	Sioux Valley Dakota Nation	38
19211	CANADIAN OXY INDUSTRIAL CHEMICALS (FORMER)	BRANDON	8080 RICHMOND AVE E, NE 10-10-18W	Sioux Valley Dakota Nation	48
52855	FORMER BRANDON INN -CS	BRANDON	901 PRINCESS AVENUE, 136 9TH STREET, 165 9TH STREET	Sioux Valley Dakota Nation	39
57630	C & C RENTALS	BRANDON	140 PACIFIC AVENUE	Sioux Valley Dakota Nation	40
58767	CANADIAN MENTAL HEALTH ASSOCIATION WESTMAN REGION	BRANDON	22 11TH STREET	Sioux Valley Dakota Nation	39
58897	MANITOBA ABORIGINAL AND NORTHERN AFFAIRS	BROCHET	FUEL FARM SITE	Barren Lands	7
19296	CARGILL LTD - BROOKDALE	BROOKDALE	NW 26-12-16 W RAILWAY AVE AT HWY 64		

## CONTAMINATED SITES AND MINE TAILINGS

<b>Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES</b>					
<b>File</b>	<b>Site Name</b>	<b>City</b>	<b>Address</b>	<b>Communities within 50 km</b>	<b>Distance</b>
19330	CARGILL LTD (FORMER SIMPLOT SOILBUILDERS) - CARBERRY	CARBERRY	NE 19-10-14 W		
20537	MANITOBA HYDRO - CHURCHILL TANK	CHURCHILL AIRPORT	CHURCHILL		
20539	MANITOBA HYDRO - CONAWAPA	CONAWAPA CAMPSITE	GILLAM		
19655	MANITOBA HYDRO - CORMORANT	CORMORANT	DIESEL GENERATING STATION		
19672	MANITOBA HYDRO - CRANBERRY PORTAGE (FORMER)	CRANBERRY PORTAGE	DIESEL GENERATING STATION		
20446	NORTHERN STORE - CROSS LAKE	CROSS LAKE	Bldg 13, NE 04-65-03 E	Cross Lake First Nation	0
21101	PETRO-CANADA FARM CENTRE - BULK PLANT - PETROPASS	DAUPHIN	HWY 5A W, SW 15-25-19 W		
54107	FORMAN FORD - DAUPHIN (FORMER)	DAUPHIN	36 2ND AVENUE NW - DAUPHIN		
55345	T & H MANUFACTURING INC	DE SALLABERRY	31007 PTH 59	Roseau River Anishinabe First Nation Government	39
22659	SHELL CANADA BULK - DELORAINE	DELORAINE	403 RAILWAY AVE E	Canupawakpa Dakota First Nation	20
17566	IMPERIAL OIL - WINNIPEG TERMINAL	EAST ST. PAUL	2925 HENDERSON HWY		
20040	SHELL CANADA BULK - HENDERSON HWY (FORMER)	EAST ST. PAUL	3879 HENDERSON HWY	Brokenhead Ojibway Nation	48
59045	MANITOBA INFRASTRUCTURE AND TRANSPORTATION	EAST ST. PAUL	2095 MCGREGOR FARM ROAD		
59929	MANITOBA HYDRO	ELIE	30 MAIN STREET EAST	Dakota Tipi	44
19735	GREY GOOSE BUS LINES - FLIN FLON	FLIN FLON	63 3RD AVE		
56774	FLIN FLON HEATING TANK #1	FLIN FLON	92 ROSS STREET		
20562	MANITOBA HYDRO - NORWAY HOUSE (FORMER)	FORMER DIESEL GENERATING STATION	NORWAY HOUSE	Norway House Cree Nation	1
20422	MANITOBA HYDRO - GILLAM - RADISSON	GILLAM	RADISSON CONVERTER STN	Fox Lake	4
19785	IMPERIAL OIL BULK - GIMLI (FORMER)	GIMLI	7TH AVE AT 2ND ST	Brokenhead Ojibway Nation Fort Alexander	42 46

## CONTAMINATED SITES AND MINE TAILINGS

<b>Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES</b>					
<b>File</b>	<b>Site Name</b>	<b>City</b>	<b>Address</b>	<b>Communities within 50 km</b>	<b>Distance</b>
20309	SHELL CANADA BULK - HADASHVILLE	HADASHVILLE	NE 20-08-12 E		
58764	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - HADASHVILLE MAINTENANCE YARD	HADASHVILLE	LOT 22, HADASHVILLE		
30094	HARTNEY CONSUMERS CO-OP	HARTNEY	201 RAILWAY ST E	Canupawakpa Dakota First Nation	11
				Sioux Valley Dakota Nation	41
26912	KENTON CONSUMERS CO-OP (FORMER BULK)	KENTON	415 WOODWORTH AVE	Birdtail Sioux	49
				Sioux Valley Dakota Nation	17
56669	LE DEPANNEUR - 154 PRINCIPALE ST	LA BROQUERIE	154 PRINCIPALE ST		
58741	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - LAC DU BONNET	LAC DU BONNET	NE 19-15-11E, HWY 317	Brokenhead Ojibway Nation	39
				Fort Alexander	41
20358	SHELL CANADA BULK - LEAF RAPIDS	LEAF RAPIDS	LEAF RAPIDS	Marcel Colomb First Nation	21
20524	SHELL CANADA BULK - LYNN LAKE AIRPORT	LYNN LAKE	LYNN LAKE AIRPORT		
20551	SHELL CANADA BULK - LYNN LAKE (FORMER)	LYNN LAKE	RAIL YARDS AT LYNN LAKE, PR 399		
55457	IMPERIAL OIL - LYNN LAKE AIRPORT	LYNN LAKE	HIGHWAY 394		
58754	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - MANIGOTAGAN YARD	MANIGOTAGAN	NE 04-25-09 E, PR 304	Hollow Water	6
				Little Black River	30
30842	MANITOBA HYDRO - MOOSE LAKE	MOOSE LAKE	DIESEL GENERATING STATION SITE	Mosakahiken Cree Nation	1
35391	MOOSE LAKE LOGGERS/MANFOR CAMP - TALBOT LAKE CAMP	MOOSE LAKE	14-59-17 TALBOT LAKE CAMP	Garden Hill First Nations	36
				St. Theresa Point	22
				Wasagamack First Nation	25
58739	MANITOBA HYDRO - 9TH ST MORDEN	MORDEN	91 NINTH STREET		
19709	SHELL CANADA BULK - MORRIS (FORMER)	MORRIS	247 JAMES ST W	Roseau River Anishinabe First Nation	23
				Government	
28614	SHELL CANADA RETAIL	NEEPAWA	154 MAIN ST	Rolling River	46

## CONTAMINATED SITES AND MINE TAILINGS

Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES					
File	Site Name	City	Address	Communities within 50 km	Distance
57887	MAZERGROUP INVESTMENT LTD	NEEPAWA	480 PTH NO. 5	Rolling River	46
59023	AG WEST EQUIPMENT	NEEPAWA	HIGHWAY 16 WEST	Rolling River	44
19696	MANITOBA HYDRO - NIVERVILLE	NIVERVILLE	303 MAIN ST		
18844	PORTAGE CO-OP BULK FERTILIZER PLANT AUSTIN	NORTH NORFOLK	SE 33-11-11 W	Dakota Plains	33
				Dakota Tipi	38
				Long Plain	32
54247	ATOMIC ENERGY OF CANADA LTD - URL	PINAWA	163 BELLUK ROAD		
19949	BORDER SHELL STATION	PINEY	HWY 12 AT SPRAGUE RD, 1098 PR308	Buffalo Point First Nation	28
19732	CARGILL LTD - PLUMAS	PLUMAS	SE 27-16-12 W	Sandy Bay	34
19745	PORTAGE LA PRAIRIE CONSUMERS CO-OP BULK PLANT (FORMER)	PORTAGE LA PRAIRIE	18TH ST NW		
20483	PUKATAWAGAN AIRPORT	PUKATAWAGAN	PUKATAWAGAN AIRPORT	Mathias Colomb	3
57336	HUDSON BAY RAILWAY (PUKATAWAGAN SIDING MILE 99.1)	PUKATAWAGAN	MILE 99.1	Mathias Colomb	8
57339	RENNIE RIVER LEISURE	RENNIE	83088 PTH 44		
19607	WHITESHELL ESSO SERVICE (FORMER)	REYNOLDS	SE 08-08-15 E, HWY NO. 1		
20190	MCMUNN MOTOR INN	REYNOLDS	NE 11-08-13 E		
28799	ICELANDIC RIVER LODGE - MANITOBA HOUSING	RIVERTON	LOT 2, PLAN 45039 MAIN ST RIVERTON	Little Black River	50
58740	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - GRAND BEACH MAINTENANCE YARD	RM OF ALEXANDER	NW 11-18-07 E	Brokenhead Ojibway Nation	21
				Fort Alexander	15
				Little Black River	35
55297	MANITOBA TRANSPORTATION - ST. PIERRE-JOLYS	RM OF DE SALABERRY	RL 32 RAT RIVER SETTLEMENT	Roseau River Anishinabe First Nation Government	36
58812	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - EAST ST. PAUL	RM OF EAST ST. PAUL	2617 MCGREGOR FARM RD		



## CONTAMINATED SITES AND MINE TAILINGS

Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES					
File	Site Name	City	Address	Communities within 50 km	Distance
58778	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - DOMINION CITY MAINTENANCE YARD	RM OF EMERSON-FRANKLIN	SW 21-02-03 E	Roseau River Anishinabe First Nation Government	9
58808	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - HEADINGLEY/WILKES	RM OF HEADINGLEY	8383 WILKES AVE		
37438	ENBRIDGE PIPELINES INC - ST LEON MILEPOST 717.5	RM of LORNE	W 32-04-09 W	Swan Lake	17
58780	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - MORRIS	RM OF MORRIS	RL342, PARISH OF STE. AGATHE	Roseau River Anishinabe First Nation Government	22
58765	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - PINEY MAINTENANCE YARD	RM OF PINEY	NE 36-01-11 E		
48357	MARTEL'S GARAGE	RM OF RHINELAND	212 MAIN STREET, ROSENFELD	Roseau River Anishinabe First Nation Government	20
57035	SHELL CANADA GRETNAL TERMINAL	RM OF RHINELAND	4087 ROAD 1 NW	Roseau River Anishinabe First Nation Government	26
59925	MANITOBA HYDRO -CS	RM OF ROCKWOOD	SW 19-13-3E PROPELLANT PLANT ROAD	Brokenhead Ojibway Nation	48
51279	MIT MYRTLE FORMER UST	RM OF ROLAND	2ND ST & SERVICE RD, MYRTLE	Roseau River Anishinabe First Nation Government	46
56769	MAPLE FARM EQUIPMENT	RM OF RUSSELL	SE 34-20-28 W	Gamblers Waywayseecappo First Nation Treaty Four - 1874	19 26
58756	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - VITA MAINTENANCE YARD	RM OF STUARTBURN	NE 16-02-07 E	Roseau River Anishinabe First Nation Government	50
58798	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - LORETTE	RM OF TACHE	RL 14, PARISH OF LORETTE		
55556	ARNASON PROPERTY, PETERSFIELD	RM ST ANDREWS	11 MAPLE DRIVE PETERSFIELD	Brokenhead Ojibway Nation	28
21077	SHELL CANADA - ROBLIN (FORMER BULK)	ROBLIN	HWY 5 E	Tootinaowaziibeeng Treaty Reserve	27
21078	PARKWAY CO-OP LTD - ROBLIN	ROBLIN	RAILWAY AVE	Tootinaowaziibeeng Treaty Reserve	27

## CONTAMINATED SITES AND MINE TAILINGS

Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES					
File	Site Name	City	Address	Communities within 50 km	Distance
20084	MAC'S CONVENIENCE STORE & GAS BAR - SELKIRK	SELKIRK	187-193 MAIN ST	Brokenhead Ojibway Nation	30
58374	CITY OF SELKIRK	SELKIRK	469 AND 471 EVELINE STREET	Brokenhead Ojibway Nation	28
40535	HUDSON BAY RAILWAY - MILE 40.4 SHERRIDON SUBDIVISION	SHERRIDON	MILE 40.4 SHERRIDON SIDING, SHERRIDON SUBDIVISION		
58810	340 TRADING POST ESSO	SHILO	14 SHILO ROAD		
34140	SAPUTO CHEESE LTD	SOURIS	166 4TH AVE W	Canupawakpa Dakota First Nation	34
				Sioux Valley Dakota Nation	30
19854	STE ANNE CONSUMERS CO-OP RETAIL - STE ANNE - 1726	STE ANNE	113 DAWSON RD		
19971	CEE-GEE'S SHELL SERVICE (FORMER) - HWY 12 & LOEWEN BLVD	STEINBACH	HWY 12 AT LOEWEN BLVD - 5 HWY 12		
20011	JAKE'S HUSKY SERVICE LTD	STEINBACH	HWY 12 AT LOEWEN BLVD		
42484	LOEWEN WINDOWS	STEINBACH	77 HWY 52 W		
46092	STE ANNE CO-OP - 365 HWY 12N - STEINBACH	STEINBACH	365 HWY 12 N		
58758	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - STEINBACH MAINTENANCE YARD	STEINBACH	NE 25-06-06 E		
60159	MANITOBA HYDRO - STEINBACH	STEINBACH	8 PIONEER ROAD		
20609	SHELL BULK STONEWALL HOOD PETROLEUM	STONEWALL	500 4TH STREET E		
35476	PEMBINA CO-OP GAS BAR - SWAN LAKE	SWAN LAKE	15 3RD ST	Dakota Plains	48
				Swan Lake	7
59145	SHELL CANADA PRODUCTS	SWAN RIVER	LOTS 5,6, AND PART OF A, BLOCK 33, PLAN NO. 370		
20517	EXXON SERVICE STATION (FORMER)	THE PAS	1413 GORDON AVE	Opaskwayak Cree Nation	0
59555	SUNTERRA HORTICULTURE CANADA INC - BEAVER POINT	UNORGANIZED	SE 29-28-5 E, PR 234	Bloodvein	41
				Fisher River	33
				Hollow Water	50



## CONTAMINATED SITES AND MINE TAILINGS

<b>Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES</b>					
<b>File</b>	<b>Site Name</b>	<b>City</b>	<b>Address</b>	<b>Communities within 50 km</b>	<b>Distance</b>
28641	VALLEYVIEW CO-OP FARM SUPPLY	VIRDEN	SW 27-10-26 W, HWY 1	Birdtail Sioux	47
				Sioux Valley Dakota Nation	31
30101	VALLEYVIEW CO-OP C-STORE - VIRDEN	VIRDEN	114 7TH AVE AT KING ST W	Birdtail Sioux	48
				Sioux Valley Dakota Nation	31
54475	RCMP -VIRDEN DETATCHMENT -CS	VIRDEN	541 KING ST	Birdtail Sioux	48
				Sioux Valley Dakota Nation	31
58775	MANITOBA INFRASTRUCTURE AND TRANSPORTATION - WHITEMOUTH MAINTENANCE YARD	WHITEMOUTH	SE 25-11-11 E		
30209	KEYSTONE RESORT	WHITESHELL PROV. PARK	NE 16-09-17 E		
59044	WINKLER CONSUMERS COOP	WINKLER	411 MAIN STREET	Roseau River Anishinabe First Nation Government	48
19432	SHELL BLENDING PLANT	WINNIPEG	350 ARCHIBALD ST		
19461	IKO (MANITOBA) LTD	WINNIPEG	421 ARCHIBALD ST		
19590	HARCROS CHEMICALS CANADA LTD (FORMER)	WINNIPEG	880 CENTURY ST		
20010	WESTEEL AGRI PRODUCTS	WINNIPEG	450 DESAUTELS ST		
20034	7-ELEVEN - 1863 HENDERSON HWY	WINNIPEG	1863 HENDERSON HWY		
20117	CARLTON CALL CENTRE INC - 365 HARGRAVE	WINNIPEG	365 HARGRAVE ST		
20125	SHAW GMC TRUCK CENTRE - KING EDWARD ST	WINNIPEG	999 KING EDWARD ST		
20257	FORMER SHELL RETAIL - 2051 MCPHILLIPS ST	WINNIPEG	2051 MCPHILLIPS ST		
20612	SHELL SELECT - 655 NOTRE DAME AVE	WINNIPEG	655 NOTRE DAME AVE		
20715	CANADIAN TURBO - NESS AVE (FORMER)	WINNIPEG	2102 NESS AVE		
20725	ROGERS SUGAR (FORMER)	WINNIPEG	555 HERVO ST		
20726	BATTLEFIELD EQUIPMENT RENTALS	WINNIPEG	10 IRENE ST		
20807	7-ELEVEN - 801 REGENT AVE	WINNIPEG	801 REGENT AVE		

## CONTAMINATED SITES AND MINE TAILINGS

<b>Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES</b>					
<b>File</b>	<b>Site Name</b>	<b>City</b>	<b>Address</b>	<b>Communities within 50 km</b>	<b>Distance</b>
20841	PAUWELS CANADA INC	WINNIPEG	101 ROCKMAN ST		
20906	SHELL CANADA RETAIL - 563 ST ANNE'S RD	WINNIPEG	563 ST ANNE'S RD		
20948	DOMINION BRIDGE	WINNIPEG	1460 DUBLIN ST		
22768	CUMMINS MID-CANADA LTD	WINNIPEG	489 OAK POINT HWY		
26347	BRAR BROS AUTO SERVICE CENTRE	WINNIPEG	914 MAIN ST		
28171	ISLAND LAKE TURBO	WINNIPEG	14 ISLAND SHORE BLVD		
30049	DUNROBIN ESSO	WINNIPEG	775 HENDERSON HWY		
40016	MISSISSIPPI JACKS CAR WASH	WINNIPEG	1034 BEAVERHILL BLVD		
41894	CITY OF WINNIPEG, FLEET MANAGEMENT AGENCY	WINNIPEG	1201 ARCHIBALD STREET		
53132	UNIVERSITY OF MANITOBA WATERWORKS BUILDING	WINNIPEG	232 FREEDMAN CRESCENT		
55060	BETNALL KENNEDY (CANADA) LP	WINNIPEG	2584 KING EDWARD ST		
55475	5244161 MANITOBA LTD, 395 STAFFORD ST	WINNIPEG	395 STAFFORD ST		
55591	SOUTHWOOD SHELL	WINNIPEG	21 LAKEWOOD BLVD		
56404	IVANHOE CAMBRIDGE	WINNIPEG	1555 REGENT AVE W		
56551	ROGERS VENTURES LTD	WINNIPEG	1111 WINNIPEG AVE		
57216	SHELL CANADA PRODUCTS	WINNIPEG	212 PANET RD		
57297	FORMER NORTH STAR REFINERY	WINNIPEG	571 MESSIER STREET		
57414	ROGERS VENTURES-55 MYRTLE-CS	WINNIPEG	55 MYRTLE ST		
57415	ROGERS VENTURES-WINNIPEG AVE PARKING LOT-CS	WINNIPEG	PART OF LOT 1, BLOCK 5, PLAN 38004 WLTO, WINNIPEG AVE		
57883	GREEN VALLEY MANAGEMENT	WINNIPEG	30 MIDLAND STREET		
58497	GATEWAY ESSO	WINNIPEG	789 MCLEOD AVENUE		
58593	MANITOBA INFRASTRUCURE AND TRANSPORTATION - ST NORBERT	WINNIPEG	749 CLOUTIER DR		
58763	UNIVERSITY OF WINNIPEG	WINNIPEG	460 PORTAGE AVENUE		
58957	MAPLES MARKETPLACE	WINNIPEG	1265-1303 JEFFERSON AVENUE		
59016	ELITE SELF STORAGE	WINNIPEG	515 MUNROE AVE		

**Table 5.8 PROVINCIAL DESIGNATED IMPACTED SITES**

<b>File</b>	<b>Site Name</b>	<b>City</b>	<b>Address</b>	<b>Communities within 50 km</b>	<b>Distance</b>
59349	MARWEST CONSTRUCTION -CS	WINNIPEG	KENASTON BOULEVARD AND SCURFIELD BOULEVARD		
60062	AGC FLAT GLASS NORTH AMERICA	WINNIPEG	450 DESCHAMBAULT ST		
60095	STERLING LYON AT KENASTON	WINNIPEG	STERLING LYON PKWY AT KENASTON BLVD		

**Table 5.9 TAILNGS REPORTED TO THE NATIONAL POLLUTANT RELEASE INVENTORY (not necessarily classified as contaminated sites)**

<b>NPRI ID</b>	<b>Company Name</b>	<b>Facility Name</b>	<b>City</b>	<b>Substance</b>	<b>Added to Tailings 2006 – 2013 (kg)</b>	<b>Communities within 50km</b>	<b>Distance</b>
0000011623	SANGOLD CORPORATION	MILL & MINE SITE	Bissett	Arsenic	873	Hollow Water Little Black River	44 50
0000003414	HUDSON BAY MINING AND SMELTING CO.	HBMS METALLURGICAL COMPLEX	Flin Flon	Arsenic	11,022,111		
0000002278	TANTALUM MINING OF CANADA	BERNIC LAKE MINESITE	Lac du Bonnet	Arsenic	5,934		
0000003411	HUDSON BAY MINING AND SMELTING CO.	HBMS SNOW LAKE MILL	Snow Lake	Arsenic	1,088,060		
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Arsenic	13,675,539		
0000023274	CANICKEL MINING LIMITED	BUCKO LAKE MINE	Wabowden	Arsenic	1,191		
0000002278	TANTALUM MINING OF CANADA	BERNIC LAKE MINESITE	Lac du Bonnet	Hexavalent chromium	1.2		
0000003414	HUDSON BAY MINING AND SMELTING CO.	HBMS METALLURGICAL COMPLEX	Flin Flon	Lead	5,306,331		
0000002278	TANTALUM MINING OF CANADA	BERNIC LAKE MINESITE	Lac du Bonnet	Lead	2,533		
0000003411	HUDSON BAY MINING AND SMELTING CO.	HBMS SNOW LAKE MILL	Snow Lake	Lead	1,035,418		
0000001473	VALE CANADA LIMITED	THOMPSON OPERATIONS	Thompson	Lead	63,495,722		
0000023274	CANICKEL MINING LIMITED	BUCKO LAKE MINE	Wabowden	Lead	3,714		
0000002278	TANTALUM MINING OF CANADA	BERNIC LAKE MINESITE	Lac du Bonnet	Mercury	6		
0000023274	CANICKEL MINING LIMITED	BUCKO LAKE MINE	Wabowden	Mercury	6.1		

## 6.0 COMMON CONTAMINANTS ASSOCIATED WITH VARIOUS ACTIVITIES<sup>53</sup>

Industrial facility/operation	Potential contaminants (see list of abbreviations at end of table)
Abandoned laboratory/chemical facilities	Metals, cyanide, ACM, pH changes, VOCs, PAHs, PCBs, solvents, site-specific chemicals used, stored or manufactured on site
Adhesives manufacturing and storage	Variable depending on type: water-based, solvent-based, epoxy resin based, natural adhesives (e.g. rubber), solvents, PHCs, isocyanate or cyanocrylates
Agricultural operations	Pesticides, metals (as components of pesticides), microbiologicals, nitrate
Airstrips/hangars operations	PHCs, BTEX, PAHs, ethylene glycol, VOCs (notably degreasing solvents), metals
Antifreeze bulk storage or recycling	Glycols
Ash from incinerators or other thermal facilities	Metals, pH change, PAHs, PCBs, dioxins/furans (depending on feedstock)
Asbestos mining, milling, wholesale bulk storage, or shipping	ACM
Automotive repair, maintenance, autobody shops	Metals (notably aluminium, cadmium, chromium, lead, mercury), VOCs, PHCs, BTEX, PAHs, acetone, carbon tetrachloride, PCE and degradation products, TCE and degradation products, ethylene glycol, CFCs, pH changes
Battery recycling, disposal	Metals (notably arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc), pH changes
Coal gasification plants/coal tar sites	PAHs, BTEX, cyanide, phenols, ammonia, metals (notably aluminium, chromium, iron, lead, nickel), pH changes
Drum and barrel recycling	Cyanide, pH changes, pesticides, PHCs, BTEX, PAHs, solvents
Dry cleaning	PCE and degradation products; some new dry cleaners employed hydrocarbon-based cleaners
Dye facilities	PAHs, benzene, toluene, metals (notably cadmium, chromium, copper, lead, mercury, nickel, zinc), anilines, amines, quinolines, pH changes
Electrical equipment/transformers	PCBs, PHCs (mineral oils), possibly PAHs and metals
Explosives or ammunition manufacturing	Metals, nitrates
Electroplating	Metals (notably cadmium, chromium, copper, nickel, zinc), cyanide, TCE and degradation products, TCA, pH changes
Electronic/computer equipment manufacturing	Solvents, TCE, TCA and degradation products, PHCs, metals
Fertilizer manufacturing and storage	Nitrate, chloride, sulphur, metals
Fire training areas	PHCs, PAHs, VOCs (notably, solvents), lead, MTBE, PFOS, PFOAs
Fire retardant manufacturing	Metals (notably antimony and brominated compounds such as polybrominated diphenyl ether), PFOS, PFOA
Firing range	PAHs, metals (notably arsenic, antimony, lead), possible ordnance (see “ordnance sites”), herbicides
Foundries and scrap metal smelting	Metals

<sup>53</sup> Health Canada. (2012). Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0 – Federal Contaminated Site Risk Assessment in Canada.

## COMMON CONTAMINANTS

<b>Industrial facility/operation</b>	<b>Potential contaminants (see list of abbreviations at end of table)</b>
Glass manufacturing	Metals (notably arsenic, cobalt, thorium, uranium and zinc), radioactive material, PHCs, BTEX, PAHs
Ink manufacturing	PHCs, BTEX, metals
Landfills	Metals (including iron, mercury, lead, zinc), PHCs, BTEX, PAHs, VOCs, phenols, cyanide, PCBs, PCDDs/DFs, pesticides, gases (including methane, carbon dioxide)
Machine maintenance shops, metal fabrication	Metals, VOCs, TCE and degradation products
Mining, smelting, ore processing, tailings	Metals, pH changes, ACM, cyanide
Mining of coal	Metals, pH changes, sulphur, PAHs
Ordnance sites	Metals, nitro substituted phenols and benzenes, trinitrotoluene (TNT), nitroaromatics, cyclotrimethylene trinitramine (RDX), hexahydro-1,3,5-trinitro-1,3,5-triazine, nitroglycerin, VOCs and SVOCs (including formaldehyde), toluene, herbicides, perchlorate, cyclic nitramine explosive HMX (octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), and unexploded ordnance (UXO)
Paint industry	Benzene, toluene, xylene, metals (notably cadmium, chromium, lead, mercury, zinc), herbicides/fungicides, VOCs
Pesticide production and use	Benzene, xylene, carbon tetrachloride, cyanide, metals (notably arsenic, cadmium, lead, mercury), CCA, VOCs, pesticides
Oil and gas – downstream petroleum facilities (service stations, tank farms, cardlots)	PHCs (notably F1 and F2), BTEX, PAHs (notably naphthalene), MTBE, organic lead compounds, glycols, other additives, redox changes (possible mobilization of certain metals)
Oil and gas – oil refineries	PHCs (F1 to F2), BTEX, VOCs, metals
Oil and gas – drilling and exploration sites (well-heads, sumps, flare pits)	Crude oil (PHCs [F1 to F4]), PAHs, BTEX, metals), produced water (salinity, sodicity, chlorides, sulphates, soluble inorganics), workover fluids (pH, salinity, methanol, glycol, Brocide®), chemical additives (pH, sodium, potassium, salinity, chloride, sulphates), halogenated solvents
Oil and gas – pipelines (transfer stations, pipeline leaks, cleanouts)	Crude oil and condensate (PHCs [F1 to F4]), PAHs, BTEX, metals), waxes (F3 and F4), halogenated solvents to clear lines
Oil and gas – waste oil (reprocessing, recycling or bulk storage)	PHC, VOCs, BTEX, metals
Photographic facilities	Metals (notably chromium, lead, mercury), TCA
Plastic manufacturing	PHCs, BTEX, styrene, isocyanites, PBDEs
Print shops	Metals, VOCs, toluene, xylene, pH changes
Pulp and paper mills	Metals (notably boron, cadmium, chromium, mercury, lead, zinc, silver, titanium), VOCs, phenols, dioxins/furans, PCBs, pH changes, cyanide
Quarry sites	Metals, VOCs
Rail yards, maintenance and tracks	PHCs, BTEX, PAHs, VOCs (including solvents and degreasing agents), phenols, PCBs, metals (notably arsenic, cadmium, lead, mercury)
Road salt storage	Chloride, sodium
Salvage/junk yards	Metals, VOCs, ACM, cyanide, PCBs, PHCs, BTEX, PAHs
Scrap metal	Metals, ACM, BTEX, halogenated solvents (notably TCE, TCA and degradation products), PCBs
Snow from street removal dumping	Metals, chloride, sodium
Steel manufacturing/coke ovens	Metals, BTEX, PAHs, PHCs, phenol
Tanneries	Metals, benzene, cyanide, VOCs, phenols, formaldehyde, pH changes, tannins and lignins
Wharves and docks	Chlorophenols, PAHs, PHCs, TBT
Wood/lumber treatment/preservation	Chlorophenols, phenols, PAHs, PHCs, BTEX, metals (CCA)

### Abbreviations:

ACM	asbestos containing material
BTEX	benzene, toluene, ethylbenzene, xylenes
CCA	chromated copper arsenate, copper chromium arsenate,
CFCs	chlorofluorocarbons;
PAHs	polycyclic aromatic hydrocarbons
PBDE	polybrominated diphenyl ethers
PCBs	polychlorinated biphenyls
PCDDs/DFs	polychlorinated dibenzodioxins/furans
PCE	tetrachloroethylene
PFOAs	perfluorooctanoic acids
PFOS	perfluorooctane sulfonate
PHCs	petroleum hydrocarbons compounds
MTBE	methyl tertiary butyl ether
SVOCs	semi-volatile organic compounds
TBT	tributyltin
TCA	trichloroethane
TCE	trichloroethylene
TNT	trinitrotoluene
UXO	unexploded ordnance
VOCs	volatile organic compounds