

# Status Report on the Performance of Mines Subject to the *Metal and Diamond Mining Effluent Regulations* in 2019



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Environment and Climate Change Canada  
Public Inquiries Centre  
12<sup>th</sup> Floor, Fontaine Building  
200 Sacré-Coeur Boulevard  
Gatineau QC K1A 0H3  
Telephone: 819-938-3860  
Toll Free: 1-800-668-6767 (in Canada only)  
Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)

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## Executive Summary

This report presents a summary of the performance of Canadian mines in 2019 with respect to the prescribed limits and requirements of the *Metal and Diamond Mining Effluent Regulations* (Regulations). The annual report provides information on mines subject to the Regulations, effluent data, compliance performance and water bodies designated as tailings impoundment areas. Approval for release does not necessarily signify that the content reflects the views and policies of Environment and Climate Change Canada.

The statistics contained in this report are provided to Environment and Climate Change Canada by owners and operators of mines. The Regulations require that owners or operators report information to Environment and Climate Change Canada, including:

- concentrations for deleterious substances including metals, cyanide and total suspended solids;
- pH of effluent;
- effluent volume; and
- summary results of fish acute lethality tests and *Daphnia magna* monitoring tests.

The compliance statistics presented in this report were compiled based on the information provided in the report submissions and do not include unreported data.

In 2019, five diamond mines and 143\*\* metal mines in Canada were subject to the Regulations. During the year, four mines became subject to the Regulations and five mines became a recognized closed mine. It was determined that 10 mines subject to the Regulations did not provide one or more monitoring reports. Compliance with prescribed monthly mean limits<sup>1</sup> for metals, cyanide, total suspended solids (TSS), and the authorized pH range is reported in the [Metal and diamond mining effluent quality indicator](#). The total number of exceedances for deleterious substances and pH reported by mines was 240. Mines reported 41 acute lethality test failures for fish and 95 *Daphnia magna* monitoring test failures.

Schedule 2 of the Regulations lists water bodies designated as tailings impoundment areas. In 2019, two water bodies frequented by fish were listed in Schedule 2 of the Regulations as tailings impoundment areas.

The Regulations are enforced by Environment and Climate Change Canada in accordance with the [Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the Fisheries Act](#).

For all purposes of interpreting and applying the law, users should consult the [Metal and Diamond Mining Effluent Regulations](#), as registered by the Clerk of the Privy Council and published in Part II of the Canada Gazette.

More information on the Regulations is available on the [Metal and diamond mining effluent webpage](#).

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\* Porcupine Gold Mines includes four different facilities (Dome Mine, Pamour Mine, Hollinger Mine and Owl Creek Mine).

\*\* Reports are submitted separately for the Nolin Creek Waste Water Treatment Plan and Copper Cliff Waste Water Treatment Plant.

<sup>1</sup> The maximum authorized monthly mean concentrations for the eight prescribed deleterious substances are listed in column 2 of Schedule 4 of the Regulations. The Regulations also set maximum concentrations for each sample (columns 3 and 4 of Schedule 4). The compliance analysis in this report only examines exceedances on a monthly average basis.

## Acronyms and Abbreviations

|                |                           |
|----------------|---------------------------|
| As             | arsenic                   |
| Bq/L           | Becquerel per litre       |
| BC             | British Columbia          |
| CN             | cyanide                   |
| Cu             | copper                    |
| DM             | <i>Daphnia magna</i>      |
| FDP            | final discharge point     |
| m <sup>3</sup> | cubic metre(s)            |
| MB             | Manitoba                  |
| mg/L           | milligram(s) per litre    |
| NB             | New Brunswick             |
| Ni             | nickel                    |
| NL             | Newfoundland and Labrador |
| NS             | Nova Scotia               |
| NT             | Northwest Territories     |
| NU             | Nunavut                   |
| ON             | Ontario                   |
| Pb             | lead                      |
| QC             | Quebec                    |
| Ra-226         | radium 226                |
| RT             | rainbow trout             |
| SK             | Saskatchewan              |
| TIA            | tailings impoundment area |
| TSS            | total suspended solids    |
| YT             | Yukon                     |
| Zn             | zinc                      |

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## 1. Introduction

The *Metal and Diamond Mining Effluent Regulations* (Regulations) aim to reduce threats to fish, fish habitat, and the use of fish by humans by improving the management of deleterious substances in metal and diamond mining effluent.

Effluent must meet concentration-based limits for arsenic, copper, cyanide, lead, nickel, zinc, suspended solids and radium 226. Effluent must also have a pH that is between a minimum and maximum level, and must not be acutely lethal. The Regulations require effluent testing and reporting, as well as Environmental Effects Monitoring studies.

Owners and operators of mines subject to the Regulations must submit notifications and report effluent monitoring results to Environment and Climate Change Canada (ECCC). The statistics contained in this report are derived from data provided to ECCC by the owners or operators of mines. These statistics do not include data that were not reported to ECCC.

The Regulations also include an authorization for the use of water frequented by fish for mine waste disposal. Authorization requires an amendment to Schedule 2 of the Regulations. Owners or operators of mines can request an amendment to Schedule 2 of the Regulations, which would designate a water frequented by fish as a tailings impoundment area.

For additional information, visit the [Metal and Diamond Mining Effluent](#) website.

## 2. Purpose

The purpose of this report is to summarize effluent quality data and compliance of mines subject to the Regulations, as reported to ECCC, as well as to summarize the water bodies that were newly designated as a tailings impoundment areas under the Regulations. In addition, the report provides an explanation of the 2019 data sets published on the Government of Canada's Open Data portal. This report includes data reported to ECCC within the past 10 years, where appropriate, to support trends-based analysis.

This summary has been compiled to inform the regulated community, other stakeholders and the public on the performance of mines subject to the Regulations. The material has been prepared for informational purposes only. For all purposes of interpreting and applying the law, users should consult the [\*Metal and Diamond Mining Effluent Regulations\*](#), as registered by the Clerk of the Privy Council and published in Part II of the *Canada Gazette*.

Approval for release does not necessarily signify that the content reflects the views and policies of ECCC.



### 3. Overview

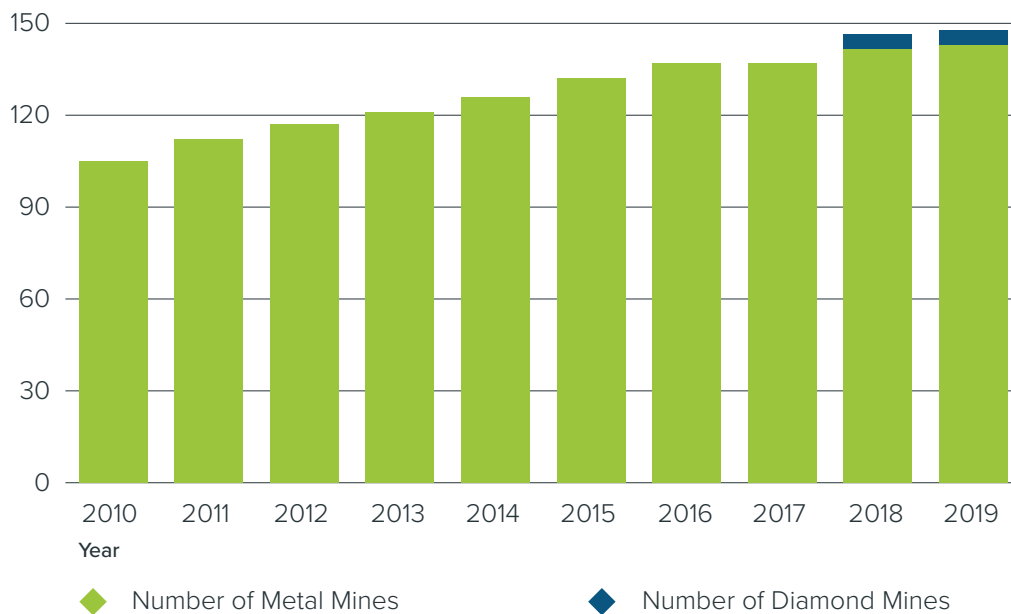
#### 3.1 Mines Subject to the Regulations

A metal or diamond mine becomes subject to the Regulations when it:

- exceeds an effluent flow rate of 50 m<sup>3</sup> per day, based on effluent deposited from all the final discharge points of the mine; and
- deposits a deleterious substance in any water or place referred to in subsection 36(3) of the *Fisheries Act*.

In 2019, 143<sup>\*</sup>,\*\* metal and five diamond mines in Canada were subject to the Regulations<sup>2</sup>. Figure 1 shows the number of facilities subject to the Regulations from 2010 to 2019.

Figure 1. Number of mines subject to the Regulations from 2010 to 2019



\* Porcupine Gold Mines includes four different facilities (Dome Mine, Pamour Mine, Hollinger Mine and Owl Creek Mine).

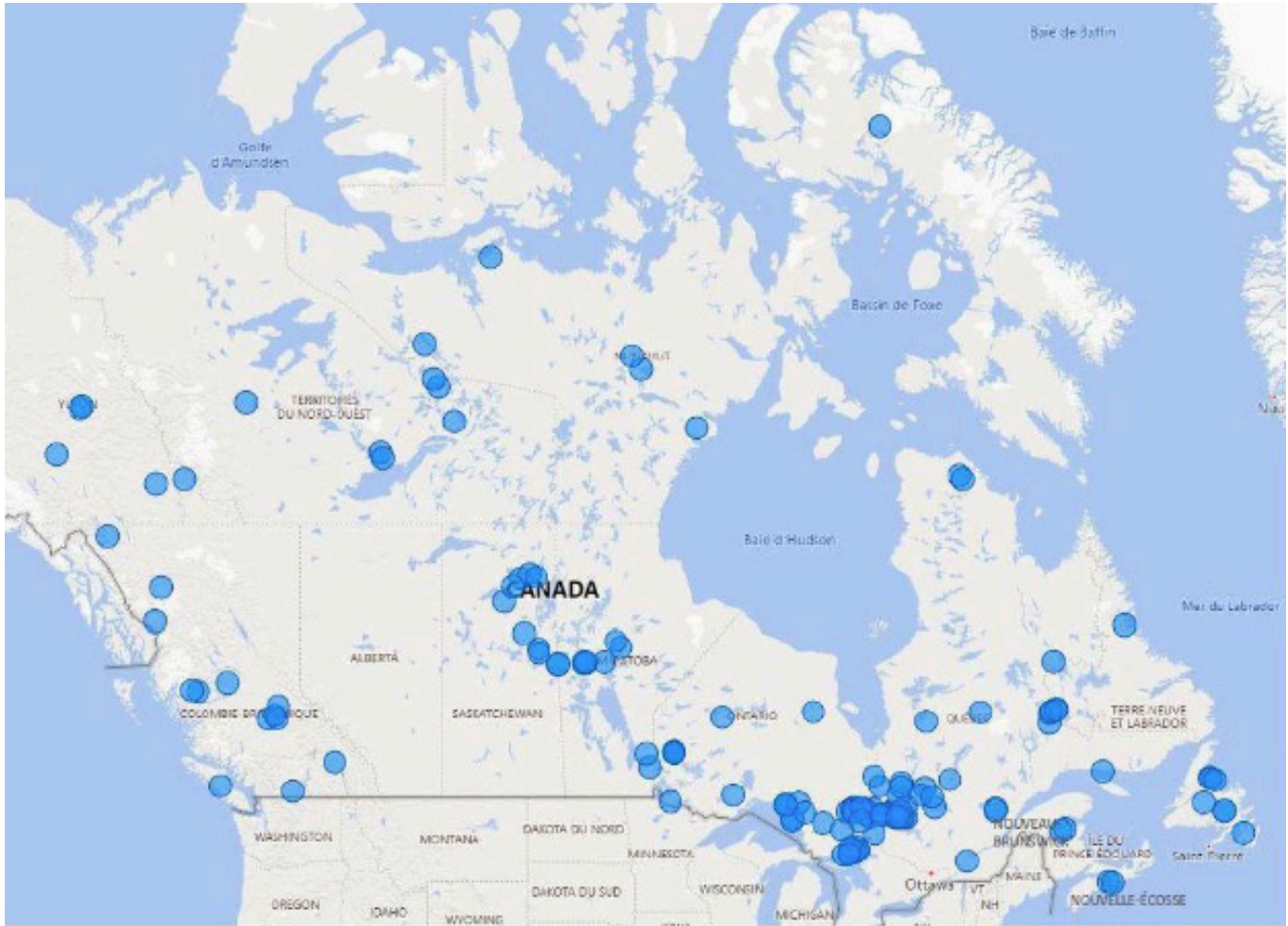
\*\* Reports are submitted separately for the Nolin Creek Waste Water Treatment Plan and Copper Cliff Waste Water Treatment Plant.

<sup>2</sup> For the purpose of this report, the number of mines subject to the Regulations refers to the mines subject to the effluent monitoring conditions set out in Division 2 of the Regulations and excludes any mine that became a recognized closed mine.

A map illustrating the locations of mines subject to the Regulations is shown in Figure 2.

A complete list of mines that are subject to the Regulations can be found on the Government of Canada's Open Data portal in the [Identification Report document](#). This document includes the name of each mine subject to the Regulations, the name of the owner and operator of each mine, and the geographic coordinates of each mine's location. Please consult the [Data Dictionary](#) for additional information related to this document.

Figure 2. Location of mines subject to the *Metal and Diamond Mining Effluent Regulations* in 2019



### 3.2 Mines with New Regulatory Status

Four mines became subject to the Regulations in 2019. Each mine subject to the Regulations is required to report information to ECCC until the mine becomes a recognized closed mine. Five mines became a recognized closed mine in 2019. Table 1 lists the facilities with new regulatory status in 2019.

**Table 1. Mines with new regulatory status in 2019**

| Mines Newly Subject To The Regulations In 2019 |              | Mines That Became A Recognized Closed Mine In 2019 |              |
|--|--------------|--|--------------|
| Mine Name                                      | Jurisdiction | Mine Name  | Jurisdiction |
| Cochenour Wilanour Complex                     | ON           | Division Monique                                   | QC           |
| Eagle Gold Mine                                | YT           | Podolsky Mine                                      | ON           |
| QR Mine  | BC           | Mine Francoeur                                     | QC           |
| Broken Hammer Mine Site*                       | ON           | McWatters Mine                                     | ON           |
|  |              | Owl Creek Mine                                     | ON           |

\*Broken Hammer Mine Site became subject to the Regulations in 2015, but did not begin reporting under the Regulations until 2019.

### 3.3 Final Discharge Points

A final discharge point (FDP), in respect of an effluent, means an identifiable discharge point of a mine beyond which the operator of the mine no longer exercises control over the quality of the effluent. Mines are required to manage all their effluent and only to discharge effluent through FDPs.

A complete list of FDPs at mines that are subject to the Regulations can be found on the Government of Canada’s Open Data portal in the [Final Discharge Points document](#). This document lists all the FDPs associated with each mine and their geographical coordinates.

## 4. Performance of Mines

### 4.1 Reporting Requirements

Owners or operators of mines subject to the Regulations are required to provide quarterly and annual monitoring reports until the mine becomes a recognized closed mine. Quarterly reports are due not later than 45 days after the end of the calendar quarter. Annual reports are due by March 31 of the following year.

Of the 148\*\* mines that are subject to the Regulations, 9 mines provided no quarterly or annual effluent monitoring reports in 2019. Additionally, there was one mine that did not submit one quarterly monitoring report and one mine that did not submit an annual monitoring report by the time this report was compiled. At the time of publishing, the number of facilities that provided incomplete reports was not available. The mines that did not submit one or more quarterly and/or annual reports in 2019 are listed in Table 2.

**Table 2. Mines that did not provide any quarterly or annual reports for 2019**

| Mine Name                      | Owner Name                      | Missing Report Type                | Jurisdiction |
|--------------------------------|---------------------------------|------------------------------------|--------------|
| Copper Rand                    | Minéraux CBay Inc.              | Annual report not submitted        | QC           |
| Wolverine Mine                 | Yukon Zinc Corporation          | One quarterly report not submitted | YT           |
| Yellow Giant Mine              | Banks Island Gold Limited       | No reports submitted               | BC           |
| Lockerby Mine                  | First Nickel Incorporated       | No reports submitted               | ON           |
| Podolsky Mine                  | FNX Mining Company Incorporated | No reports submitted               | ON           |
| McWatters Mine                 | Northern Sun Mining Corporation | No reports submitted               | ON           |
| Redstone Mine                  | Northern Sun Mining Corporation | No reports submitted               | ON           |
| Clavos Mine                    | Sage Gold Incorporated          | No reports submitted               | ON           |
| Edwards Mine                   | Strike Minerals Incorporated    | No reports submitted               | ON           |
| Timminco Metals<br>Haley Plant | Timminco Limited                | No reports submitted               | ON           |
| Yukon Refinery                 | Yukon (36569) Incorporated      | No reports submitted               | ON           |

\* Porcupine Gold Mines includes four different facilities (Dome Mine, Pamour Mine, Hollinger Mine and Owl Creek Mine).

\*\* Reports are submitted separately for the Nolin Creek Waste Water Treatment Plan and Copper Cliff Waste Water Treatment Plant.

## 4.2 Prescribed Deleterious Substances and pH

The Regulations include provisions to allow the discharge of metal and diamond mine effluent into water frequented by fish, subject to certain requirements. The Regulations authorize the deposit of effluent that contains a deleterious substance if:

- the concentration of the deleterious substance in the effluent does not exceed the authorized limits;
- the pH of the effluent is equal to, or greater than, 6.0 but is not greater than 9.5; and
- the effluent is not acutely lethal<sup>3</sup>.

Owners and operators of mines are required to conduct regular monitoring of effluent and report information to ECCC. Reported information includes, for each FDP:

- concentrations for deleterious substances including metals, cyanide and total suspended solids;
- pH range of effluent;
- effluent volume; and
- summary results of fish acute lethality tests and *Daphnia magna* monitoring tests.

Compliance with prescribed monthly mean limits<sup>4</sup> for metals, cyanide, total suspended solids (TSS), and the pH limits<sup>5</sup> is reported in the [Metal and diamond mining effluent quality indicator](#). The indicator presents the annual percentage of reported test results for all mines that are within the authorized limits from 2003 onwards.

For deleterious substances, individual test results for each substance are compared with the maximum authorized concentration in a grab or composite sample set out in the Regulations. All the test results in a month for each substance are used to calculate monthly mean concentrations for each FDP. Performance is evaluated by comparing the monthly mean concentrations to the maximum authorized monthly mean concentration limits set out in the Regulations, and evaluating how many monthly mean concentrations reported to ECCC are below the prescribed limits.

For pH, individual test results for each grab sample are compared with the prescribed range. Performance is evaluated by determining how many grab samples reported to ECCC are within the prescribed range.

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<sup>3</sup> An effluent is deemed non-acutely lethal if it kills less than or equal to 50% of the rainbow trout or threespine stickleback subjected to it at 100% concentration over a 96-hour period.

<sup>4</sup> The maximum authorized monthly mean concentrations for the eight prescribed deleterious substances are listed in column 2 of Schedule 4 of the Regulations. The Regulations also set maximum concentrations for each sample (column 3 and 4 of Schedule 4). The compliance analysis in this report only examines exceedances on a monthly average basis.

<sup>5</sup> The minimum and maximum allowable pH in any effluent sample is specified in paragraph 4(1)(b) of the Regulations.

Figure 3 shows the total number of exceedances for deleterious substances and pH against the number of mines subject to the Regulations from 2010 to 2019. In general, there has been a decrease over time in the total number of exceedances with the prescribed monthly mean limits for metals, cyanide, total suspended solids and the pH limits despite the number of mines having increased.

Figure 3. Total number of exceedances for deleterious substances and pH, against number of mines from 2010 to 2019

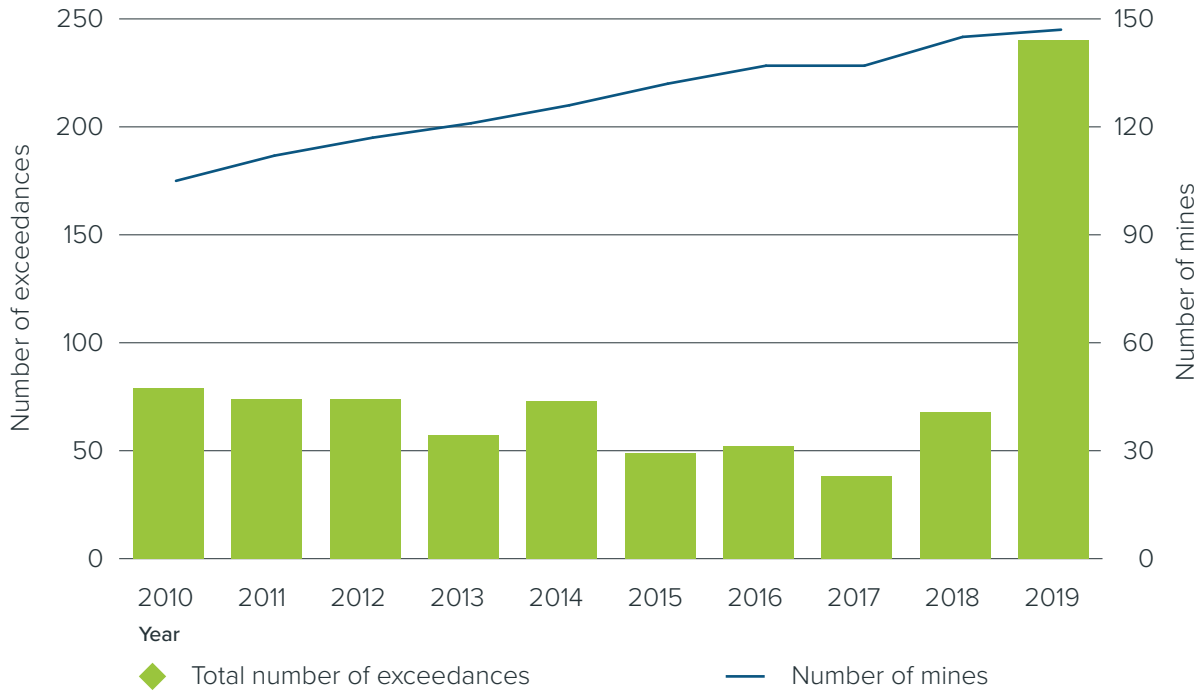


Table 3 shows the number of exceedances for each of the deleterious substances and pH for the reporting years 2010 to 2019. An increase in the number of exceedances for several parameters, including nickel, zinc, TSS, and pH low, was observed in 2019. The majority of these exceedances occurred at a small number of mines. For example, a mine in Quebec was responsible for majority of the exceedances for nickel, zinc,  $\text{pH} \leq 6$ , and  $\text{pH} \geq 9.5$ .

**Table 3. Number of exceedances for deleterious substances and pH from 2010 to 2019**

| Substance/ Parameter | Number of Exceedances Each Year |           |           |           |           |           |           |           |           |            |
|----------------------|---------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
|                      | 2010                            | 2011      | 2012      | 2013      | 2014      | 2015      | 2016      | 2017      | 2018      | 2019       |
| Arsenic              | 1                               | 2         | 2         | 3         | 1         | 0         | 0         | 0         | 0         | 0          |
| Copper               | 1                               | 1         | 3         | 4         | 4         | 1         | 2         | 0         | 0         | 1          |
| Cyanide              | 0                               | 1         | 5         | 3         | 1         | 1         | 0         | 0         | 1         | 1          |
| Lead                 | 0                               | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0          |
| Nickel               | 9                               | 5         | 5         | 3         | 9         | 2         | 1         | 1         | 7         | 28         |
| Zinc                 | 3                               | 4         | 4         | 3         | 6         | 0         | 1         | 2         | 9         | 25         |
| TSS                  | 57                              | 53        | 51        | 30        | 35        | 29        | 30        | 30        | 35        | 59         |
| Radium-226           | 2                               | 1         | 1         | 7         | 4         | 5         | 6         | 2         | 0         | 3          |
| pH Low               | 3                               | 4         | 2         | 3         | 10        | 10        | 10        | 3         | 12        | 115        |
| pH High              | 3                               | 3         | 1         | 1         | 3         | 1         | 2         | 0         | 4         | 8          |
| <b>Total</b>         | <b>79</b>                       | <b>74</b> | <b>74</b> | <b>57</b> | <b>73</b> | <b>49</b> | <b>52</b> | <b>38</b> | <b>68</b> | <b>240</b> |

Table A1 in Appendix A lists the mines that reported an exceedance and the number of exceedances that were reported for each of the prescribed deleterious substances and pH during the 2019 reporting year.

All effluent quality results for prescribed deleterious substances and pH, as reported to ECCC by mines is published on the Government of Canada's [Open Data Portal](#). It should be noted that the frequency of testing varies depending on the individual mine and its performance. Under the Regulations, operators are required to test the effluent at each FDP weekly for deleterious substances and monthly for acute lethality (fish toxicity) and to record the results of all tests. The frequency of testing can be reduced to once per quarter in the following instances:

- for arsenic, copper, cyanide<sup>6</sup>, lead, nickel and zinc: if the concentration of the substance from a discharge point is less than 10% of the regulations monthly mean concentration limit for that substance over a period of 12 consecutive months;
- for radium 226 from a mine, other than uranium mines: if the concentration of radium 226 is less than 0.037 Becquerel per litre in 10 consecutive weeks of testing; and
- for fish toxicity: if the effluent is determined not to be acutely lethal over a period of 12 consecutive months.

<sup>6</sup> The owner or operator of a mine is not required to collect samples for the purpose of recording the concentrations of cyanide if cyanide has never been used as a process reagent at the mine.

### 4.3 Fish and Invertebrate Toxicity

Fish acute lethality refers to tests of effluent on mortality rate to fish as determined by the acute lethality tests for rainbow trout or threespine stickleback. Invertebrate acute lethality includes the test results submitted for *Daphnia magna* monitoring tests. The [biological test methods publications](#) webpage provides more information on the biological test methods prescribed by the Regulations to determine acute lethality.

In 2019, a total of 1,453 fish acute lethality tests were conducted. Of those tests, five mines reported 41 fish acute lethality tests that resulted in greater than 50% fish mortality. In the same year a total of 1,454 *Daphnia magna* monitoring tests were conducted, of which 95 tests with greater than 50% mortality were reported by 22 mines. Table 4 summarizes fish mortality, as well as the result of the *Daphnia magna* monitoring tests for the 2019 reporting year by region.

The acute lethality test results for rainbow trout and threespine stickleback and *Daphnia magna* monitoring tests as reported to ECCC by owner and operators of mines are published on the Government of Canada’s Open Data platform. The data are published in three separate files. Rainbow trout acute lethality test results can be accessed [here](#). Threespine stickleback acute lethality results can be accessed [here](#). *Daphnia magna* monitoring tests can be accessed [here](#).

**Table 4. Performance summary: fish acute lethality and *Daphnia magna* monitoring tests in 2019, by region**

| Region*          | Fish Acute Lethality |                              |                                    | <i>Daphnia magna</i> Monitoring Tests |                                |                                    |
|------------------|----------------------|------------------------------|------------------------------------|---------------------------------------|--------------------------------|------------------------------------|
|                  | Total # of Tests     | of Tests with >50% Mortality | # of Mines that Reported a Failure | Total # of Tests                      | # of Tests with >50% Mortality | # of Mines that Reported a Failure |
| Atlantic         | 200                  | 0                            | 0                                  | 205                                   | 16                             | 5                                  |
| Ontario          | 270                  | 1                            | 1                                  | 273                                   | 1                              | 1                                  |
| Pacific-Yukon    | 286                  | 0                            | 0                                  | 288                                   | 10                             | 3                                  |
| Prairie-Northern | 198                  | 2                            | 1                                  | 193                                   | 9                              | 2                                  |
| Quebec           | 499                  | 38                           | 3                                  | 495                                   | 59                             | 11                                 |
| <b>Total</b>     | <b>1453</b>          | <b>41</b>                    | <b>5</b>                           | <b>1454</b>                           | <b>95</b>                      | <b>22</b>                          |

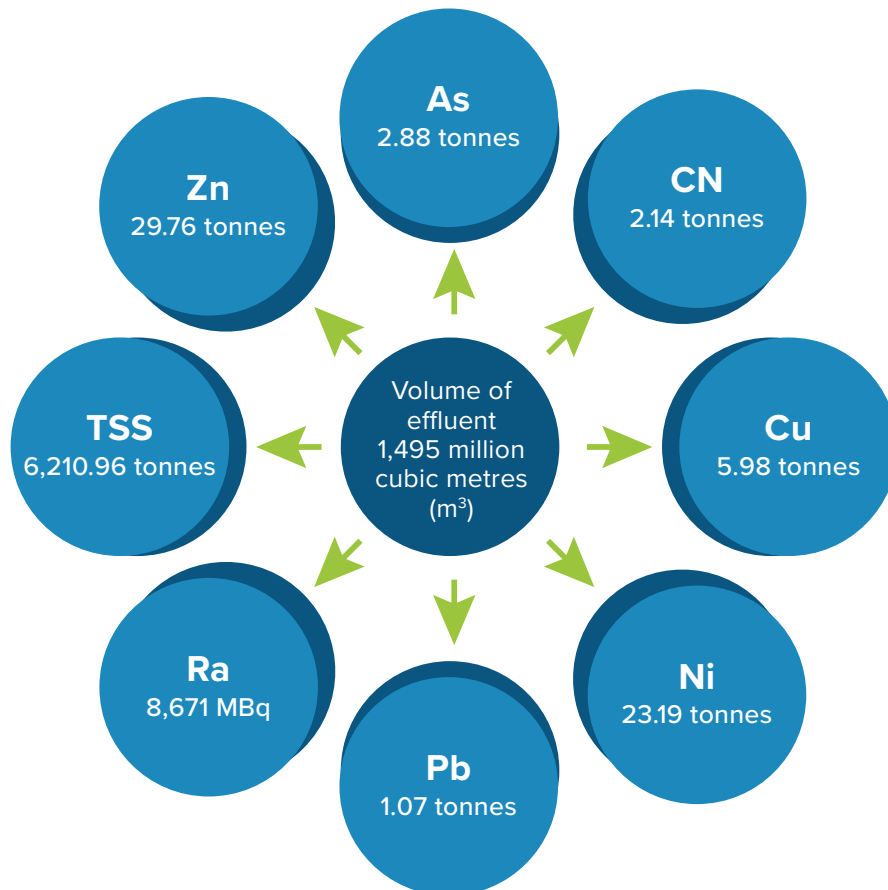
\* Regions are classified as follows: Atlantic region includes the provinces of New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island. Ontario region includes the province of Ontario. Pacific-Yukon region includes the province of British Columbia, and Yukon Territory. Prairie-Northern region includes the provinces of Alberta, Manitoba, Saskatchewan, the Northwest Territories, and the territory of Nunavut. Quebec region includes the province of Quebec.



## 5. Volume of Effluent and Loading of Deleterious Substances

Analysis of the self-reported effluent data showed that in 2019, metal and diamond mines subject to the Regulations deposited 1,495 million cubic meters of effluent into waters frequented by fish. Figure 4 illustrates the total volume of effluent and total loading of each deleterious substance deposited by the 148\*\*,\*\* mines subject to the Regulations in the 2019 reporting year.

Figure 4. Total effluent volume and deleterious substances released in 2019



The 2019 data were compiled by ECCC officials using the effluent quality information provided by owners and operators of metal and diamond mines in their annual and quarterly reports.

## 6. Water Bodies Designated as Tailings Impoundment Areas

The Regulations authorize the deposit of mine waste (such as waste rock, tailings and effluent) containing any concentration of deleterious substance into a tailings impoundment area (TIA) that is either:

- a water or place set out in Schedule 2 of the Regulations; or
- a confined disposal area other than a disposal area that is or is part of a natural water body that is frequented by fish.

TIAs are water bodies into which mine waste that does not meet the prescribed limits in the Regulations may be disposed. Water bodies are listed in Schedule 2 via a regulatory amendment of the Regulations. Additional information on TIAs and the process for listing a water body in Schedule 2 of the Regulations is provided on the [tailings impoundment areas webpage](#).

In 2019, two water bodies were listed in Schedule 2 of the Regulations as TIAs. Table 5 lists the water or place that were added to Schedule 2 in 2019. At the end of 2019, Schedule 2 contained 48 listings of waters that are associated with 22 metal mines. For a complete list of water bodies that have been designated as TIAs, please consult the [Schedule 2 List on Open Data](#).

**Table 5. New waterbodies listed on Schedule 2 of the Regulations in 2019**

| Mine Name      | Province/ Territory | Item # <sup>7</sup> | Water Body Name  | Link to <i>Canada Gazette</i> Part II Publication |
|----------------|---------------------|---------------------|--|---|
| Sisson Project | New Brunswick       | 47                  | A portion of Bird Brook and its tributaries                      | <a href="#">Sisson Mine</a>                       |
|                |                     | 48                  | A portion of an unnamed tributary to West Branch Napadogan Brook |   |

<sup>7</sup> The Item # in Table 5 identifies the item number as specified in Schedule 2 of the Regulations. For the official names and complete description of the water body listings, please consult the full text of the Regulations.

## 7. Compliance and Enforcement

ECCC's Enforcement Branch enforces the pollution prevention provisions of the *Fisheries Act* and accompanying regulations to protect and prevent harm to fish, fish habitat or human use of fish. The Regulations are enforced by ECCC in accordance with the provisions of the [Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the Fisheries Act](#). The policy sets out a range of possible responses to offences that can be used by enforcement officers, including warnings, directions, ministerial orders, injunctions, prosecution and civil suits by the Crown for the recovery of costs. When there is evidence of an alleged violation, an enforcement officer considers the nature of the alleged offence, effectiveness in achieving the desired result with the alleged offender, and consistency in enforcement in order to determine the appropriate response.

## Contact Us

Comments and inquiries about the content of this summary review should be addressed to:

Mining Section  
Mining and Processing Division  
Industrial Sectors, Chemicals and Waste Directorate  
Environmental Protection Branch  
Environment and Climate Change Canada

Gatineau, Quebec  
Canada K1A 0H3

[mdmer-remmmd@ec.gc.ca](mailto:mdmer-remmmd@ec.gc.ca)

## Appendix A: Performance Summary of Mine Effluent Not Meeting Effluent Quality Standards

The tables presented in this appendix summarize the number of exceedances reported in the effluent quality data by mines subject to the *Metal and Diamond Mining Effluent Regulations* in 2019. The summaries include site identification (i.e., mine/mill name and final discharge point name) and number of months of discharge. Table A1 summarizes the distribution of the non-compliant parameters for prescribed deleterious substances and pH, whereas Table A2 summarizes the results of fish acute lethality tests and *Daphnia magna* monitoring tests.

Prescribed deleterious substances exceedances represent the number of monthly mean concentrations that exceeded the prescribed limits for a given month, whereas pH exceedances represent the number of months that the pH range was exceeded. The parameters included are arsenic (As), copper (Cu), cyanide (CN), lead (Pb), nickel (Ni), zinc (Zn), total suspended solids (TSS), radium 226 (Ra-226) and pH.

**Table A1. Exceedance Summary for Facilities Subject to the Regulations in 2019: Prescribed Parameters and pH**

| Site Identification  |                                   | As 0.5 mg/L | Cu 0.3 mg/L | CN 1.00 mg/L | Pb 0.2 mg/L | Ni 0.5 mg/L | Zn 0.5 mg/L | TSS 15 mg/L | Ra-226 0.37 Bq/L | pH ≤ 6 | pH ≥ 9.5 |
|----------------------|-----------------------------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|------------------|--------|----------|
| Mine Name            | Final Discharge Point Name        |             |             |              |             |             |             |             |                  |        |          |
| Bellekeno Mine       | KV-43                             | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Bonanza Ledge Mine   | Sediment Control Pond (SCP-NAG)   | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Caribou Mine         | Polishing Pond Discharge          | 0           | 0           | 0            | 0           | 0           | 1           | 0           | 0                | 0      | 0        |
| Carol Project        | Hakim Culvert                     | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Carol Project        | Luce Lake Dewatering              | 0           | 0           | 0            | 0           | 0           | 0           | 2           | 0                | 0      | 0        |
| Copper Mountain Mine | SW45                              | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Division Laronde     | Effluent Final                    | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Eagle Gold Mine      | LDSP                              | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Eagle River Mill     | MILL-POL                          | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Ekati Diamond Mine   | Seep-019                          | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 0                | 10     | 0        |
| Ekati Diamond Mine   | Seep-081                          | 0           | 0           | 0            | 0           | 0           | 0           | 2           | 0                | 0      | 0        |
| Ekati Diamond Mine   | Seep-373A                         | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| HBMS Trout Lake Mine | Trout Lake Surface Sump Discharge | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 1                | 0      | 0        |

| Site Identification                    |  | As 0.5 mg/L | Cu 0.3 mg/L | CN 1.00 mg/L | Pb 0.2 mg/L | Ni 0.5 mg/L | Zn 0.5 mg/L | TSS 15 mg/L | Ra-226 0.37 Bq/L | pH ≤ 6 | pH ≥ 9.5 |
|--|--|-------------|-------------|--------------|-------------|-------------|-------------|-------------|------------------|--------|----------|
| Mine Name                              | Final Discharge Point Name                               |             |             |              |             |             |             |             |                  |        |          |
| La Mine Niobec                         | Effluent d'urgence                                       | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Mallard Tailings Impoundment Area      | Final Discharge Point - Mallard TIA - Cell C Outlet Berm | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Mary River Mine Site                   | MS-06  | 0           | 0           | 1            | 0           | 0           | 0           | 0           | 0                | 0      | 0        |
| Mary River Mine Site                   | MS-08  | 0           | 0           | 0            | 0           | 0           | 0           | 2           | 0                | 0      | 0        |
| Meliadine Gold Project                 | MEL-26   | 0           | 0           | 0            | 0           | 0           | 0           | 2           | 0                | 0      | 0        |
| Mine de Fire Lake                      | Effluent final garage Fire-Lake (FLG-1)                  | 0           | 0           | 0            | 0           | 0           | 0           | 3           | 0                | 0      | 0        |
| Mine de Fire Lake                      | Effluent final garage Fire-Lake (FLG-2)                  | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Mine de Mont-Wright                    | Effluent ES-DLR-5  | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 0                | 3      | 0        |
| Mine de Mont-Wright                    | Effluent ES-DLR-6  | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 0                | 1      | 0        |
| Mine de Mont-Wright                    | Effluent ES-DLR-7  | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 0                | 3      | 0        |
| Mine de Mont-Wright                    | Effluent ES-SA-1   | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 0                | 1      | 0        |
| Mine de Mont-Wright                    | Effluent final MS-7                                      | 0           | 0           | 0            | 0           | 2           | 2           | 0           | 0                | 0      | 0        |
| Mine de Mont-Wright                    | Effluent final RDT-6                                     | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 0                | 1      | 0        |
| Mine de Mont-Wright                    | Effluent final RDT-7                                     | 0           | 0           | 0            | 0           | 10          | 10          | 8           | 0                | 43     | 2        |
| Mine de Mont-Wright                    | Effluent final RDT-8                                     | 0           | 0           | 0            | 0           | 10          | 10          | 8           | 0                | 40     | 6        |
| Mine de Mont-Wright                    | Effluent HS-2 TEMP                                       | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Mine Fire Lake                         | Effluent final garage Fire-Lake (FLG-1)                  | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Mine Fire Lake                         | Effluent final garage Fire-Lake (FLG-2)                  | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Nolin Creek Waste Water Treatment Plan | Nolin Creek Spillway                                     | 0           | 1           | 0            | 0           | 1           | 1           | 1           | 0                | 1      | 0        |
| Nyrstar Myra Falls                     | MF.11A - Runoff Myra Pond Effluent                       | 0           | 0           | 0            | 0           | 0           | 0           | 1           | 0                | 0      | 0        |
| Osisko Mining inc Project Windfall     | EFF-1  | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 1                | 2      | 0        |

| Site Identification                                    |                                      | As 0.5 mg/L | Cu 0.3 mg/L | CN 1.00 mg/L | Pb 0.2 mg/L | Ni 0.5 mg/L | Zn 0.5 mg/L | TSS 15 mg/L | Ra-226 0.37 Bq/L | pH ≤ 6     | pH ≥ 9.5 |
|--|--------------------------------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|------------------|------------|----------|
| Mine Name  | Final Discharge Point Name           |             |             |              |             |             |             |             |                  |            |          |
| Projet Nunavik Nickel                                  | Effluent final Mésamax               | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 0                | 5          | 0        |
| Rio Tinto Fer et Titane inc. - HAVRE-SAINT-PIERRE      | Ancienne Croix                       | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 0                | 4          | 0        |
| Rio Tinto Fer et Titane inc. - HAVRE-SAINT-PIERRE      | Rh Léo                               | 0           | 0           | 0            | 0           | 5           | 0           | 0           | 0                | 0          | 0        |
| Rio Tinto Fer et Titane inc. - Complexe de Sorel-Tracy | 2.5 Effluent des Poudres             | 0           | 0           | 0            | 0           | 0           | 0           | 7           | 0                | 0          | 0        |
| SMC (Canada) Ltd.                                      | Polishing Pond                       | 0           | 0           | 0            | 0           | 0           | 0           | 0           | 1                | 0          | 0        |
| Tata Steel Minerals Canada                             | DSO3 Sed Pond 3                      | 0           | 0           | 0            | 0           | 0           | 1           | 0           | 0                | 0          | 0        |
| Tata Steel Minerals Canada                             | Outlet of Sedimentation Pond 2       | 0           | 0           | 0            | 0           | 0           | 0           | 2           | 0                | 1          | 0        |
| Wabush Mines - Scully                                  | Flora Lake Discharge                 | 0           | 0           | 0            | 0           | 0           | 0           | 2           | 0                | 0          | 0        |
| Wabush Mines - Scully                                  | Knoll Lake Inflow                    | 0           | 0           | 0            | 0           | 0           | 0           | 2           | 0                | 0          | 0        |
| Wabush Mines - Scully                                  | Tailings Line Emergency Dump Basin 1 | 0           | 0           | 0            | 0           | 0           | 0           | 3           | 0                | 0          | 0        |
| <b>Total</b>   |                                      | <b>0</b>    | <b>1</b>    | <b>1</b>     | <b>0</b>    | <b>28</b>   | <b>25</b>   | <b>59</b>   | <b>3</b>         | <b>115</b> | <b>8</b> |

**Table A2. Exceedance Summary for Facilities Subject to the Regulations in 2019: Rainbow Trout (RT) Acute Lethality, Threespine Stickleback (TS) Acute Lethality and *Daphnia Magna* (DM) Monitoring Tests**

| Site Identification                               |  | Rainbow Trout Total | Rainbow Trout Fail | Threespine Stickleback Total | Threespine Stickleback Fail | <i>Daphnia Magna</i> Total | <i>Daphnia Magna</i> Fail |
|---|--|---------------------|--------------------|------------------------------|-----------------------------|----------------------------|---------------------------|
| Mine Name   | Final Discharge Point Name             |                     |                    |                              |                             |                            |                           |
| Mine de Mont-Wright                               | Effluent final MS-7                    | 2                   | 0                  | 0                            | 0                           | 2                          | 1                         |
| Mine de Mont-Wright                               | Effluent final RDT-7                   | 48                  | 31                 | 0                            | 0                           | 47                         | 34                        |
| Mine de Mont-Wright                               | Effluent final RDT-8                   | 17                  | 4                  | 0                            | 0                           | 15                         | 8                         |
| Mine Raglan                                       | DIR-SPOON                              | 2                   | 0                  | 0                            | 0                           | 3                          | 2                         |
| Mine Raglan                                       | DIR-UT                                 | 5                   | 0                  | 0                            | 0                           | 5                          | 3                         |
| La Mine Niobec                                    | Effluent Final                         | 4                   | 0                  | 0                            | 0                           | 4                          | 3                         |
| Nyrstar Myra Falls                                | MF.11A - Runoff Myra Pond Effluent     | 12                  | 0                  | 0                            | 0                           | 12                         | 1                         |
| Rio Tinto Fer et Titane inc. - HAVRE-SAINT-PIERRE | Ancienne Croix                         | 7                   | 0                  | 0                            | 0                           | 7                          | 1                         |
| Rio Tinto Fer et Titane inc. - HAVRE-SAINT-PIERRE | Rh Léo                                 | 13                  | 1                  | 0                            | 0                           | 10                         | 0                         |
| Voisey's Bay Mine Site                            | Treated Effluent Final Discharge Point | 5                   | 0                  | 0                            | 0                           | 4                          | 3                         |
| La mine Doyon                                     | Effluent final du bassin A (D-203)     | 4                   | 0                  | 0                            | 0                           | 4                          | 1                         |
| Mine Géant Dormant                                | GD-E03                                 | 4                   | 0                  | 0                            | 0                           | 3                          | 1                         |
| Huckleberry Mines Ltd.                            | TRO - Tahtsa Reach Outflow             | 9                   | 0                  | 0                            | 0                           | 9                          | 1                         |
| Usine Camflo inc                                  | EF-VN                                  | 4                   | 0                  | 0                            | 0                           | 4                          | 1                         |
| HBMS Flin Flon Metallurgical Complex              | North Weir                             | 4                   | 0                  | 0                            | 0                           | 4                          | 3                         |
| Wabush Mines - Scully                             | Flora Lake Discharge                   | 15                  | 0                  | 0                            | 0                           | 17                         | 2                         |
| Wabush Mines - Scully                             | Knoll Lake Inflow                      | 13                  | 0                  | 0                            | 0                           | 15                         | 2                         |
| Wabush Mines - Scully                             | Tailings Line Emergency Dump Basin 1   | 12                  | 0                  | 0                            | 0                           | 12                         | 2                         |



| Site Identification                                      |   | Rainbow Trout Total | Rainbow Trout Fail | Threespine Stickleback Total | Threespine Stickleback Fail | <i>Daphnia Magna</i> Total | <i>Daphnia Magna</i> Fail |
|--|---|---------------------|--------------------|------------------------------|-----------------------------|----------------------------|---------------------------|
| Mine Name  | Final Discharge Point Name  |                     |                    |                              |                             |                            |                           |
| Wabush Mines - Scully                                    | West Pit Extension Settling Basin   | 13                  | 0                  | 0                            | 0                           | 15                         | 4                         |
| Rio Tinto Fer et Titane inc.-<br>Complexe de Sorel-Tracy | 2.5 Effluent des Poudres  | 12                  | 1                  | 0                            | 0                           | 13                         | 1                         |
| Rio Tinto Fer et Titane inc.-<br>Complexe de Sorel-Tracy | EFF2.2-P84  | 11                  | 1                  | 0                            | 0                           | 10                         | 0                         |
| Mine du Lac Bloom  | EFF-REC2 Effluent de l'unité de<br>traitement eaux usées et bassins<br>de recirculation | 10                  | 0                  | 0                            | 0                           | 10                         | 1                         |
| Anaconda Mining Inc.                                     | Polishing Pond  | 2                   | 0                  | 0                            | 0                           | 2                          | 1                         |
| Projet Nunavik Nickel                                    | Effluent final Mésamax  | 3                   | 0                  | 0                            | 0                           | 4                          | 1                         |
| Tata Steel Minerals Canada                               | DSO3 Sed Pond 3   | 1                   | 0                  | 0                            | 0                           | 1                          | 1                         |
| Ming Copper-Gold Mine                                    | Waste Water Treatment<br>System Discharge   | 12                  | 0                  | 0                            | 0                           | 12                         | 1                         |
| Caribou Mine   | Polishing Pond Discharge  | 12                  | 0                  | 0                            | 0                           | 12                         | 1                         |
| Silvertip Mine   | Effluent Discharge 1 (ED1)  | 13                  | 0                  | 0                            | 0                           | 13                         | 8                         |
| Meliadine Gold Project                                   | MEL-14  | 4                   | 0                  | 5                            | 2                           | 3                          | 0                         |
| Nolin Creek Waste<br>Water Treatment Plan                | Nolin Creek Spillway  | 1                   | 1                  | 0                            | 0                           | 1                          | 1                         |
| Birchtree Mine   | Birchtree Effluent Treatment<br>Plant Discharge   | 5                   | 0                  | 0                            | 0                           | 6                          | 6                         |
| <b>Total</b>   |   | <b>279</b>          | <b>39</b>          | <b>5</b>                     | <b>2</b>                    | <b>279</b>                 | <b>95</b>                 |

## Appendix B: Regulatory Data Available on the Open Data Portal

Regulatory data files that contain the data submitted to Environment and Climate Change Canada (ECCC) by owners and operators of mines subject to the *Metal and Diamond Mining Effluent Regulations* are published on [Canada's Open data portal](#). The table below lists the data files published on the Open data portal in the order in which they are referenced in the Annual Report and describes the data contained in each file.

ECCC has developed a Data Dictionary that includes a list and description of the data fields included in the dataset found on the Open data portal. Please consult the [Data Dictionary](#) for additional information on the data published on the Open data portal.

| File Name  | List of Data  | Link to File  |
|--|---|---|
| 2-2019-present-présent-MDMER-REMMMD-identification-report-rapport-d-identification | <ul style="list-style-type: none"> <li>• Facility identification (ID)</li> <li>• Facility name</li> <li>• Organization name</li> <li>• Design rated capacity (tonnes/year)</li> <li>• Rationale for design rated capacity</li> <li>• National Pollutant Release Inventory (NPRI)</li> <li>• Owner address - name</li> <li>• Operator address – name</li> <li>• Latitude</li> <li>• Longitude</li> </ul> | <a href="https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/2-2019-present-pr%C3%A9sent-MDMER-REMMMD-identification-report-rapport-d-identification.csv">https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/2-2019-present-pr%C3%A9sent-MDMER-REMMMD-identification-report-rapport-d-identification.csv</a> |
| 3-2019-present-présent-MDMER-REMMMD-final-discharge-points-points-de-rejet-final   | <ul style="list-style-type: none"> <li>• Facility ID</li> <li>• Facility name</li> <li>• Organization name</li> <li>• Final discharge point name</li> <li>• Latitude</li> <li>• Longitude</li> </ul>  | <a href="https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/3-2019-present-pr%C3%A9sent-MDMER-REMMMD-final-discharge-points-points-de-rejet-final.csv">https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/3-2019-present-pr%C3%A9sent-MDMER-REMMMD-final-discharge-points-points-de-rejet-final.csv</a>     |

| File Name   | List of Data  | Link to File   |
|---|---|--|
| <p>4-2019-present-présent-MDMER-REMMMD-deleterious-substance-monitoring-surveillance-des-substances-nocives</p> | <ul style="list-style-type: none"> <li>• Facility ID</li> <li>• Facility name</li> <li>• Final discharge point name</li> <li>• Year</li> <li>• Quarter</li> <li>• Final discharge point latitude</li> <li>• Final discharge point longitude</li> <li>• Collection date</li> <li>• Collection method</li> <li>• Failed acute lethality test?</li> <li>• Total effluent volume deposited, m<sup>3</sup></li> <li>• Concentration, in mg/L, of :                             <ul style="list-style-type: none"> <li>• Arsenic</li> <li>• Copper</li> <li>• Cyanide</li> <li>• Lead</li> <li>• Nickel</li> <li>• Zinc</li> <li>• Suspended solids</li> </ul> </li> <li>• Concentration, in Bq/L, of Radium 226</li> <li>• pH value</li> </ul> | <p><a href="https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/4-2019-present-pr%C3%A9sent-MDMER-REMMMD-deleterious-substance-monitoring-surveillance-des-substances-nocives.csv">https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/4-2019-present-pr%C3%A9sent-MDMER-REMMMD-deleterious-substance-monitoring-surveillance-des-substances-nocives.csv</a></p> |
| <p>5-2019-present-présent-MDMER-REMMMD-Rainbow-trout-acute-lethality-letalite-aigue-truite-arc-en-ciel</p>      | <ul style="list-style-type: none"> <li>• Facility ID</li> <li>• Facility name</li> <li>• Final discharge point</li> <li>• Region</li> <li>• Year</li> <li>• Quarter</li> <li>• Sample date time</li> <li>• Observed concentration %v/v</li> <li>• Mean mortality number 96<sup>th</sup> hour</li> <li>• Mean stressed number 96<sup>th</sup> hour</li> <li>• Mean mortality rate 96<sup>th</sup> hour %</li> <li>• Mean stressed rate 96<sup>th</sup> hour %</li> </ul>   | <p><a href="https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/5-2019-present-pr%C3%A9sent-MDMER-REMMMD-Rainbow-trout-acute-lethality-letalite-aigue-truite-arc-en-ciel.csv">https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/5-2019-present-pr%C3%A9sent-MDMER-REMMMD-Rainbow-trout-acute-lethality-letalite-aigue-truite-arc-en-ciel.csv</a></p>           |

| File Name   | List of Data  | Link to File  |
|---|---|---|
| 6-2019-present-présent-MDMER-REMMMD-Threespine-stickleback-acute-lethality-letalite-aigue-epinoche-a-trois-epines | <ul style="list-style-type: none"> <li>• Facility ID</li> <li>• Facility name</li> <li>• Final discharge point</li> <li>• Region</li> <li>• Year</li> <li>• Quarter</li> <li>• Sample date time</li> <li>• Observed concentration %v/v</li> <li>• Mean mortality number 96<sup>th</sup> hour</li> <li>• Mean stressed number 96<sup>th</sup> hour</li> <li>• Mean mortality rate 96<sup>th</sup> hour %</li> <li>• Mean stressed rate 96<sup>th</sup> hour %</li> </ul> | <a href="https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/6-2019-present-pr%C3%A9sent-MDMER-REMMMD-Threespine-stickleback-acute-lethality-letalite-aigue-epinoche-a-trois-epines.csv">https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/6-2019-present-pr%C3%A9sent-MDMER-REMMMD-Threespine-stickleback-acute-lethality-letalite-aigue-epinoche-a-trois-epines.csv</a> |
| 7-2019-present-présent-MDMER-REMMMD-Daphnia-magna-acute-lethality-letalite-aigue-Daphnia-magna                    | <ul style="list-style-type: none"> <li>• Facility ID</li> <li>• Facility name</li> <li>• Final discharge point</li> <li>• Region</li> <li>• Year</li> <li>• Quarter</li> <li>• Sample date time</li> <li>• Observed concentration %v/v</li> <li>• Mean mortality number 48<sup>th</sup> hour</li> <li>• Mean stressed number 48<sup>th</sup> hour</li> <li>• Mean mortality rate 48<sup>th</sup> hour %</li> <li>• Mean stressed rate 48<sup>th</sup> hour %</li> </ul> | <a href="https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/7-2019-present-pr%C3%A9sent-MDMER-REMMMD-Daphnia-magna-acute-lethality-letalite-aigue-Daphnia-magna.csv">https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/7-2019-present-pr%C3%A9sent-MDMER-REMMMD-Daphnia-magna-acute-lethality-letalite-aigue-Daphnia-magna.csv</a>                                       |
| 8-2019-present-présent-MDMER-REMMMD-Schedule-2-Annexe-2   | <ul style="list-style-type: none"> <li>• Mining facility name</li> <li>• Province/Territory</li> <li>• Item #</li> <li>• Water Body Name</li> <li>• Year added to Schedule 2</li> <li>• Link to <i>Canada Gazette</i> Part II publication (English)</li> <li>• Link to <i>Canada Gazette</i> Part II publication (French)</li> </ul>  | <a href="https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/8-2019-present-pr%C3%A9sent-MDMER-REMMMD-Schedule-2-Annexe-2.csv">https://data-donnees.ec.gc.ca/data/substances/plansreports/metal-and-diamond-mining-effluent-regulations-compliance-data/2019-present-pr%C3%A9sent-MDMER-REMMMD/8-2019-present-pr%C3%A9sent-MDMER-REMMMD-Schedule-2-Annexe-2.csv</a>   |