

**PERFORMANCE AGREEMENT  
CONCERNING AIR POLLUTANTS  
FROM BASE METALS FACILITIES  
(herein “Agreement”)**

BETWEEN

**HER MAJESTY THE QUEEN IN RIGHT OF CANADA,  
AS REPRESENTED BY THE MINISTER OF THE ENVIRONMENT WHO IS RESPONSIBLE  
FOR THE DEPARTMENT OF THE ENVIRONMENT  
(herein “EC”)**

AND

**GLENCORE CANADA CORPORATION  
(herein “Glencore”)**

Each of the above is individually referred to as “Party” and collectively as “Parties”.

**Preamble**

WHEREAS the production by base metals facilities results in atmospheric emissions of sulphur dioxide (SO<sub>2</sub>), particulate matter (PM) and other air pollutants;

WHEREAS the *Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Specified Toxic Substances Released from Base Metals Smelters and Refineries and Zinc Plants* published in 2006 has resulted in significant reductions of emissions of SO<sub>2</sub> and PM;

WHEREAS, in October 2012, federal, provincial and territorial environment ministers took action to better protect human health and the environment by endorsing and implementing the new Air Quality Management System (AQMS). The AQMS includes Canadian Ambient Air Quality Standards for fine particulate matter and ground-level ozone, Base Level Industrial Emissions Requirements (BLIERs) and local Air Zone Management by the provincial/territorial jurisdictions. For the Base Metals sector, BLIERs were developed for SO<sub>2</sub> and PM;

WHEREAS the Minister of the Environment recognizes voluntary action of industry as an efficient means to achieve environmental objectives;

WHEREAS EC will encourage a new company which opens a new Base Metals Facility to sign a similar Agreement;

AND WHEREAS the Parties share a common interest in continuing efforts to reduce atmospheric emissions of SO<sub>2</sub> and PM.

Therefore, the Parties hereby agree as follows:

## 1.0 PURPOSE

The purpose of this Agreement is for Glencore, at each of its facilities, to:

- achieve and maintain the BLIERs for emissions of SO<sub>2</sub> and PM, indicated in Section 9.0; and
- agree to continual improvement, where reasonably feasible, with respect to:
  - a. further reducing emissions of SO<sub>2</sub> and PM;
  - b. reducing emissions of metals and Fugitive PM; and
  - c. implementing the applicable recommendations in the Code of Practice.

## 2.0 DEFINITIONS

**“Base Metals Facility”** means a pyrometallurgical or hydrometallurgical facility that produces one or more of the following metals from feed material that comes primarily from ore:

- a) nickel;
- b) copper;
- c) zinc;
- d) lead;
- e) cobalt; and
- f) chromium.

**“Code of Practice”** means the *Environmental Code of Practice for Base Metals Smelters and Refineries*, Environment Canada Report EPS, 1/MM/11, announced in *Canada Gazette Part I*, April 29, 2006.

**“Existing Facility”** means a Base Metal Facility listed under Section 9.1, herein referred to as a “facility” or “facilities” throughout the Agreement, except when preceded by the word “New”.

**“Fugitive PM”** means particulate matter containing metals released from sources other than Process Sources.

**“New Facility”** means a Base Metal Facility that comes into operation after the date of signature.

**“Particulate Matter”** or **“PM”** means filterable particulate matter containing metals released from Process Sources.

**“Particulate Matter Emission Intensity”** means the ratio of the total particulate matter emissions from Process Sources to the sum of any of the metals listed in the definition of Base Metals Facility under Section 2.0 produced annually at the facility.

**“Process Source”** refers to the targeted sources listed in Table 1 of Annex 1 for each Glencore facility.

**“Sulphur Mass Balance”** means an accounting of the quantity of sulphur going into the process, the quantity of sulphur captured in products, by-products and wastes, and the quantity of sulphur released into the atmosphere.

**“Sulphur Capture Rate”** means the percentage of the total sulphur captured with respect to the total sulphur entering the facility on an annual basis, except when alternative methods outlined under Section 10.1.2 are used.

**“Year”** and **“Annual”** refer to the calendar year.

### **3.0 LEGAL STATUS**

This Agreement does not and is not intended to create legally binding obligations between the Parties, nor does it constitute any admission of liability by either of the Parties.

This Agreement and all annexes listed throughout constitute the entire agreement between the Parties. There are no undertakings, representations, promises or warranties, expressed or implied, other than those contained in the Agreement and its annexes.

By signing this Agreement, each Party agrees to fully conform to its commitment for as long as it is a Party to the Agreement.

Nothing in this Agreement precludes a Party from implementing any other environmental or human health initiatives as it sees fit.

Adherence to this Agreement does not in any way exempt Glencore from complying with any and all applicable laws and regulations.

### **4.0 DURATION**

This Agreement is effective from the date of signature to December 31, 2025, unless terminated earlier in accordance with Section 5.0.

### **5.0 TERMINATION**

The Parties may on mutual consent in writing terminate this Agreement at any time.

Either Party may terminate this Agreement at any time, without cause and for its sole convenience, by giving at least one year’s written notice of its intention to terminate to the other Party.

### **6.0 AMENDMENTS**

This Agreement may be amended at any time by mutual consent of the Parties. In order to be valid, any amendment to this Agreement shall be in writing and signed by the Parties.

### **7.0 ASSIGNMENT AND SUCCESSORS**

This Agreement will apply to the successors and assignees of Glencore.

## 8.0 UNDERSTANDINGS

In the event of the definitive closure of one of its facilities, Glencore will be relieved of its responsibilities under this Agreement for that facility.

This Agreement is not intended to prevent the Government of Canada from recommending or taking any legislative, regulatory, or other measures necessary for the protection of human health or the environment or any measure that it deems appropriate, and nothing in the Agreement may be construed as having such an effect.

If the objectives and the requirements under this Agreement are not being achieved, the Minister will determine whether other measures, including regulations, are needed to further prevent or reduce impacts on human health or the environment.

## 9.0 RISK MANAGEMENT OBJECTIVES

### 9.1 SO<sub>2</sub> and PM BLIERs for Existing Facilities

Glencore agrees to achieve and maintain the following BLIERs for each of its facilities:

Facility	SO <sub>2</sub>	PM	Implementation Date
	Annual Sulphur Capture Rate	Annual PM Emission Intensity (kg/tonne)	
Sudbury Integrated Nickel Operations	90%	4	January 1, 2019
Horne Smelter	90%	2	Date of Signature
Brunswick Smelter	90%	2	Date of Signature
CCR Refinery	N/A	2	Date of Signature

### 9.2 SO<sub>2</sub> and PM BLIERs for New Facilities

Glencore agrees to achieve and maintain the following BLIERs for New Facilities:

SO <sub>2</sub>	Facility Type	Sulphur Capture Rate*
	Lead and zinc smelters	99%
	Nickel and copper smelters	97%
PM	A target will be negotiated when a New Facility becomes operational	

\*Note that the sulphur capture rates do not apply to facilities which only have hydrometallurgical operations

### **9.3 Working Group on Quantification and Reporting of Metals and Fugitive PM**

Glencore agrees to participate in a working group, with representatives from EC, provincial governments, other companies in the base metal sector, and the Mining Association of Canada, to assess the consistency and robustness of the data reported to the National Pollutant Release Inventory. This would include developing sector-wide recommendations with respect to:

- quantifying emissions of condensable PM and PM<sub>2.5</sub> (i.e. testing methods, frequency of testing)
- quantifying emissions of Fugitive PM (i.e. testing methods, frequency of testing)
- reporting emissions of Fugitive PM (e.g. what is considered fugitive)
- quantifying emissions of key metals (i.e. testing methods, frequency of testing)

It is recognized that some differences in quantification and reporting among facilities are a result of different provincial requirements. Consideration will be given to account for these differences, where possible.

The working group is to be created within six months of the effective date of the Agreement.

### **9.4 Facility-Level Analysis**

Glencore agrees to work bilaterally with EC to better understand its facilities' metal emissions and identify possible technologies and/or actions which could reduce the emissions of metals identified in Table 2 of Annex 1 for each Glencore facility.

### **9.5 Code of Practice**

Glencore agrees to continual improvement towards the implementation of applicable recommendations of the Code of Practice at each of its facilities.

## **10.0 TESTING, QUANTIFICATION AND REPORTING**

For each of its facilities, Glencore agrees to follow the testing and quantification specifications for SO<sub>2</sub>, PM and PM emission intensity outlined in Annex 2 of this Agreement. Additional details specific to each facility are outlined in Table 1 of Annex 1.

### **10.1 Calculation of Sulphur Capture Rate**

#### 10.1.1 Sulphur Mass Balance Method

The sulphur capture rate specified in Section 9.1 is to be determined on the basis of a mass balance, as defined in Section 2.0, and calculated on a monthly basis using the following steps:

- calculate the total amount of sulphur entering the process;
- calculate the total sulphur inventory change during the month (list sources and add the individual monthly changes);
- add or subtract, as appropriate, the total sulphur inventory change to the total amount of sulphur entering the process;
- calculate the total amount of sulphur captured in each product, by-product and waste;
- calculate the percent sulphur capture rate.

### 10.1.2 Alternative Quantification Method

A facility may use the alternative quantification method if it can verifiably demonstrate that it was consistently achieving >98% annual sulphur capture rate, using sulphur mass balance, or other provincially accepted methodology for three consecutive years preceding the year the Agreement comes into force.

The alternative option would also be available for any facility that is able to achieve >98% sulphur capture rate for three consecutive years at any time during the lifetime of the Agreement using the sulphur mass balance method outlined in Section 10.1.1.

A facility that meets the above requirements has the option of using a method accepted by the province upon concurrence by EC, or the alternative quantification method described below, for quantification, reporting and verification requirements under the PA.

For quantification, reporting and verification requirements under the Agreement, a facility that meets the above requirements has the option of using:

- i) the following alternative quantification method:
  - calculate the total amount of sulphur entering the process;
  - calculate the total sulphur inventory change during the month (list sources and add the individual monthly changes);
  - add or subtract, as appropriate, the total sulphur inventory change to the total amount of sulphur entering the process;
  - determine the sulphur released into the atmosphere using a Continuous Emissions Monitoring System;
  - calculate the total amount of sulphur captured in products, by-products and wastes by subtracting the total sulphur released from the total sulphur entering the process;
  - calculate the percent sulphur capture rate.

or

- ii) another method accepted by provincial regulatory authorities upon review and concurrence by EC.

### **10.2 Reference Manual**

For each of its facilities, Glencore agrees to document in detail (e.g. in a reference manual), the methodologies used to determine the PM emission intensity and sulphur capture rate as required by Section 9.1.

### **10.3 Annual Reports**

Glencore agrees to prepare and submit annual reports for each of its facilities and ensure that data included in each annual report is complete, accurate, and verifiable. The annual report will include data and information related to the following:

1. the SO<sub>2</sub> BLIERs, where applicable;
2. the PM BLIERs;
3. the status update for BLIERs Implementation, where applicable;
4. the implementation of the Code of Practice, where applicable.

#### 10.4 Reporting on the SO<sub>2</sub> BLIERS

Unless identified otherwise in Table 3 of Annex 1, Glencore, for each of its facilities, agrees to use EC's template (referenced in Annex 3) to quantify and report, annually, the monthly sulphur capture rates and the annual average sulphur capture rates.

With respect to the SO<sub>2</sub> BLIERS, the annual report will include, as a minimum, the following:

- on a monthly basis:
  - for all sulphur containing substances entering the process:
    - a. the total quantity of each substance;
    - b. the average sulphur content of each substance;
  - the sulphur inventory change during the month (list sources and add the individual monthly changes);
  - either:
    - i) for all sulphur containing products, by-products and wastes;
      - a. the average sulphur content of each product, by-product and waste;
      - b. the total quantity of sulphur in the products and wastes;
    - or
    - ii) the sulphur released to the atmosphere measured using a Continuous Emission Monitoring System; facilities which use this option must meet the requirements specified in Section 10.1.2;
- the sum of the 12 months sulphur input into the process;
- the sum of the 12 months sulphur captured in the products, by-products and wastes;
- the annual average sulphur capture rate for the facility;
- the annual sulphur dioxide emissions from the facility.

#### 10.5 Exemption for Reporting on SO<sub>2</sub> BLIER

A Glencore facility does not need to provide the required information related to meeting the SO<sub>2</sub> BLIER in the annual report if there is no target identified in Section 9.1 for that facility.

#### 10.6 Reporting on PM BLIERS

Unless identified otherwise in Table 4 of Annex 1, Glencore, for each of its facilities, agrees to use EC's template (referenced in Annex 3) to quantify and report particulate matter releases and emission intensity.

With respect to the PM BLIERS, the annual report will include, as a minimum, the following:

- the annual average PM concentration for each Process Source;
- the number of source tests conducted for each Process Source;
- the annual average dry gas flow rate for each Process Source;
- the number of days of operation in the year;
- the total annual quantity of PM from the Process Sources at the facility;
- the total annual quantity of metal produced at the facility; and
- the annual average PM emission intensity from the Process Sources at the facility.

### **10.7 Exemption for Reporting on PM BLIER**

A Glencore facility is not required to report PM emissions under this Agreement if that facility achieves an annual PM emission intensity < 1 kg/tonne for three consecutive years at any time during the lifetime of the Agreement.

The verification in accordance with Section 12.0 may take place up to two years before the effective date of this Agreement. In this case, any years subsequent to the verification may count towards the three consecutive years, if Glencore attests that the quantification methodology used in those years is consistent with the year of verification. Alternatively, up to two years preceding the verification may count towards the three consecutive years, if the auditor attests in the verification report that the quantification methodology used in those years is consistent with the year of verification. To obtain an exemption, the facility must submit an annual report with the verification report for the corresponding year.

Notwithstanding this exemption, the facility is required to continue its annual emissions reporting obligation to the NPRI.

### **10.8 Revocation of Exemption**

An exemption granted under condition 10.7 could be revoked, if in subsequent years or at any time during the life of the Agreement, the annual PM threshold of < 1 kg/tonne is exceeded. In this case, the facility could be required to begin or resume reporting, unless and until a reasonable explanation of the circumstances, under which the exceedance occurred, is provided to the satisfaction of EC.

### **10.9 Status Update for BLIERs Implementation**

For the Sudbury Integrated Nickel Operations facility, Glencore agrees to include in each of its first annual reports:

- a description and timeline for the work plan to meet the BLIERs which have an implementation date in 2019;
- the planned outcome of the work plan (e.g. estimated emission reductions to be achieved).

In subsequent annual reports, Glencore will include an update on the work plans to achieve the BLIERs at these facilities, including details of the work that has been completed by the end of the reporting year and an estimate of the percentage of completion of the full BLIERs implementation.

### **10.10 Reporting on the Code of Practice**

As part of the annual report for each facility, Glencore agrees to report on the implementation of the Code of Practice as set out in Annex 4.



### **10.11 Submission of Reports**

Glencore will submit all reports covering each calendar year of the Agreement no later than June 30 of the following year (e.g. reports for the 2017 operating year are due June 30, 2018). Reports will be sent to the following address:

Subject title: BMS PA  
Regulatory Innovation and Management Systems  
351 St. Joseph Blvd, 20<sup>th</sup> floor  
Gatineau, Quebec  
K1A 0H3  
Canada  
Phone : 1-844-580-3637

Or electronically to [ec.epa-epe.ec@canada.ca](mailto:ec.epa-epe.ec@canada.ca)

### **10.12 Retention of Records**

Glencore will retain all records related to the Agreement, including data and worksheets used for emissions quantification, for seven years from when the data was created, and make them available to EC upon request.

### **10.13 Reporting to the National Pollutant Release Inventory**

Glencore agrees, where possible, to use the same quantification methodology prescribed for the PA (see Annex 2), when reporting process emissions to the National Pollutant Release Inventory for SO<sub>2</sub> and PM.

Glencore agrees to work toward implementation of the recommendations of the working group, where applicable, for quantification and reporting of Fugitive PM and metals at each of its facilities.

## **11.0 PUBLIC PROGRESS SUMMARY BY EC**

EC will publish public progress summaries describing results, performance and activities that have taken place within the base metal sector under this Agreement and other Performance Agreements related to air pollutants from this sector. In preparation of this report, EC will consult with Glencore and other base metal companies which have signed similar Performance Agreements with EC.

EC will publish the public progress summary in electronic format on EC's website ([www.ec.gc.ca/epa-epe](http://www.ec.gc.ca/epa-epe)).

## **12.0 INDEPENDENT VERIFICATION OF PM AND SO<sub>2</sub> EMISSIONS**

Glencore agrees to retain, at its own cost, the services of an independent auditor to verify the results in each facility's reports, as outlined in Annexes 2 and 3, once within two years of the effective date of the Agreement. Glencore should ensure that the auditor follows the verification protocol as outlined in Annex 5.

If the verification occurs after the effective date of the Agreement, then the verification by the auditor must cover the same period as an annual report prepared in accordance with Section 10.0. If the verification occurs prior to the effective date of the Agreement, then the verification by the auditor must cover a calendar year as if an annual report were being prepared in accordance with Section 10.0.

As outlined in Annex 5, the verification will include, but may not be limited to, verifying:

- emissions levels of SO<sub>2</sub> and PM;
- production levels;
- quantification and calculations;
- emissions measurement methodology;
- reference standards utilized, etc.

Upon the completion of the verification, Glencore will:

- be required to provide a copy of the auditor's verification report to EC no later than September 30, 2018;
- address any material deficiencies identified in the verification report related to errors in estimating emissions (e.g. inadvertent inclusion or exclusion of data, application of incorrect emission factors, errors in measurement units or conversion of units etc.);
- correct errors and re-submit the whole or partial annual report within 30 days following the completion of the verification report, if this occurs after June 30;
- submit a work plan outlining how it intends to address the deficiencies for the next reporting year, if these deficiencies are the result of systematic or procedural errors. This may entail a requirement to re-verify all or part of its facility's results, if EC determines it to be necessary, upon review of the implemented corrective actions and bilateral consultation.

### **13.0 EC VERIFICATION OF THE FACILITIES' ANNUAL REPORTS**

EC will verify the data submitted annually by Glencore under Section 10.0. As part of the verification, EC may also review NPRI reported data for consistency and notable changes to metals and Fugitive PM emissions. This could be followed by interviews and submission of additional supporting information by Glencore. EC may also perform additional verification by means of one or more site visits to the facility, following an appropriate notice.

### **14.0 ROLES AND RESPONSIBILITIES**

For each of its facilities, Glencore agrees to:

- achieve and maintain the BLIERs for SO<sub>2</sub> and PM emissions, continually improve, where reasonably feasible, to reduce emissions of metals and Fugitive PM, and continually improve the implementation of applicable recommendations in the Code of Practice;
- prepare annual reports, as outlined in the relevant Annexes of this Agreement and collaborate with EC during the review of these reports;
- retain the service of an independent auditor to verify the reporting outlined in the relevant Annexes of this Agreement, once during the first two years of the Agreement and address material deficiencies identified by the independent auditor;

- participate in a working group to improve the consistency and robustness of the data reported to the National Pollutant Release Inventory; and
- work with EC to better understand its metal emissions and identify possible technologies and/or actions which could reduce these emissions.

EC agrees to:

- review the annual reports submitted by Glencore;
- review the verification reports submitted by Glencore;
- prepare public progress summaries for posting on EC's website;
- participate in a working group to improve the consistency and robustness of the data reported to the National Pollutant Release Inventory; and
- work with Glencore to better understand issues related to metal emissions, measurement, and quantification methodologies.

## 15.0 AVAILABILITY OF THE AGREEMENT AND CONFIDENTIAL INFORMATION

A copy of this Agreement and Environment Canada's progress reports will be made available on Environment Canada's web site.

### Confidential Information

Environment Canada agrees to keep confidential and not disclose any confidential information obtained from the Parties under this Agreement that has been identified as being confidential to the extent that a written request for confidentiality has been submitted at the same time as the information was provided. The request must specify the information that is considered to be confidential and the reason why it should be treated as such.

Nothing in this Agreement shall be interpreted so as to preclude Environment Canada from disclosing information that Environment Canada may be required or ordered to disclose pursuant to any applicable federal laws or court orders, including, the Access to Information Act, R.S. 1985.

## 16.0 SIGNATURES

The Parties acknowledge that they have read and accepted all of the provisions of the Agreement.

**HER MAJESTY THE QUEEN IN RIGHT OF CANADA, as represented by the Minister of the Environment**

By: \_\_\_\_\_  
(print name)

Title: \_\_\_\_\_  
(print title)

Signature: \_\_\_\_\_

[If there is no delegation instrument in place, add:] For and on behalf of the Minister of the Environment

Signed this \_\_\_\_ day of \_\_\_\_\_, 2016

[if desired/required:]

In the presence of: \_\_\_\_\_  
(signature)

**GLENCORE CANADA CORPORATION**

By: \_\_\_\_\_  
(print name)

Title: \_\_\_\_\_  
(print title)

I represent and warrant that I am duly authorized to bind Glencore Canada Corporation

Signature: \_\_\_\_\_

Signed this \_\_\_\_ day of \_\_\_\_\_, 2016

[if desired/required:]

In the presence of: \_\_\_\_\_  
(signature)

**ANNEX 1:  
FACILITY SPECIFIC INFORMATION**

**Table 1\* - Targeted Sources for PM Emissions by Facility**

<b>Facility</b>	<b>Process Source</b>	<b>Measurement Methodology and Frequency</b>
Sudbury Integrated Nickel Operations	1. Main Stack	Annual source testing
Horne Smelter	1. #2 Stack	Annual source testing
	2. #4 Stack	Annual source testing
Brunswick Smelter	1. Sinter Plant Baghouse	Annual source testing
	2. Blast Furnace Baghouse	Annual source testing
	3. Stack P27 Scrubber	Annual source testing
	4. Short Rotary Furnace Centre	Annual source testing
	5. Silver Baghouse	Annual source testing
	6. Short Rotary Furnace East	Annual source testing
CCR Refinery	1. Steam Boilers Section (3 sources)	Emission factors used annually
	2. Casting Section (4 sources)	Source testing at a minimum of every 5 years with engineering estimates used in other years
	3. Tankhouse Section (8 sources)	Source testing at a minimum of every 5 years with engineering estimates used in other years
	4. Tankhouse Heating	Emission factors used annually
	5. MEC 1000, MEC 2000, MEC 3000	Source testing on MEC 1000, MEC 2000 or MEC 3000 at a minimum of every 5 years with engineering estimates used in other years
	6. MPSP Section - precious metals and byproducts sections (13 sources)	Source testing at a minimum of every 5 years with engineering estimates used in other years

\* This table may be amended at any time based on bilateral discussion and agreement between Glencore and EC

**Table 2 –Metals Emissions by Facility**

	<b>Sudbury Integrated Nickel Operations</b>	<b>Horne Smelter</b>	<b>Brunswick Smelter</b>	<b>CCR Refinery</b>
Antimony		X	X	X
Arsenic	X	X	X	X
Cadmium	X	X	X	X
Cobalt	X			
Chromium	X	X		X
Copper	X	X	X	X
Lead	X	X	X	X
Manganese	X	X		
Mercury		X	X	
Nickel	X	X		
Selenium	X	X		X
Vanadium	X		X	
Zinc	X	X	X	

x – indicates metals that were reported to the NPRI in 2012; other metals may be added/removed based on bilateral discussion and agreement between EC and Glencore

**Table 3\* – Quantification and Reporting Methods for the SO<sub>2</sub> BLIERs by Facility**

<b>Facility Name</b>	<b>Quantification and Reporting Method</b>
Sudbury Integrated Nickel Operations	EC Template
Horne Smelter	Provincial report prepared to satisfy the requirements of Section 192 of the Quebec Clean Air Regulation, updated February 1, 2015 and as amended from time to time (along with additional information to satisfy the minimum requirements of Section 10.4 of the Agreement)
Brunswick Smelter	EC Template
CCR Refinery	N/A

\* This table may be amended at any time based on bilateral discussion and agreement between Glencore and EC

**Table 4\* – Reporting Methods for the PM BLIERs by Facility**

<b>Facility Name</b>	<b>Reporting Method</b>
Sudbury Integrated Nickel Operations	EC Template
Horne Smelter	Provincial report prepared to satisfy the requirements of Sections 9 and 10 of the Quebec Clean Air Regulation, updated February 1, 2015 and as amended from time to time (along with additional information to satisfy the minimum requirements of Section 10.6 of the Agreement)
Brunswick Smelter	EC Template
CCR Refinery	EC Template

\* This table may be amended at any time based on bilateral discussion and agreement between Glencore and EC

**ANNEX 2:  
TESTING AND QUANTIFICATION PROCEDURES**

**Sulphur Dioxide**

<p><b>Materiality of Sources:</b> For the sulphur mass balance, if it is determined that some sources are too small to have any significant impact on the sulphur balance, these may be excluded from the calculations.</p>
<p><b>Weighing:</b> All mass inputs and outputs into and out of the process should be determined using weighing scales (or machines) that conform to the Canadian Weights and Measures Act (1985), or calculated by other suitable means (e.g. density, flow meter, metallurgical balance). All equipment is to be regularly inspected and calibrated.</p>
<p><b>Sampling and Sample Preparation:</b> Facilities should have documented sampling procedures that conform to provincial, national or international methodologies, or standards that are routinely practiced in the industry, and are equivalent to internationally known methodologies (e.g. ASTM, ISO).</p>
<p><b>Analytical Testing:</b> All analytical testing should conform to provincially, federally or internationally accepted analytical methods (e.g. ASTM (LECO)) or where applicable, methods that are routinely practiced by industry.</p>
<p><b>Sampling and Testing Frequency:</b> Each facility may use its own schedule and strategy for sampling and analytical testing, or a schedule and strategy in accordance with the requirements, if any, of the jurisdiction where they are located. Schedules and procedures should be documented and made available upon request.</p>
<p><b>Continuous Emissions Monitoring:</b> For measurement by a Continuous Emissions Monitoring System (CEMS), it is expected that the CEMS would be operated in accordance with Environment Canada’s EPS 1/PG/7 (Protocols and Performance Specifications for Continuous Monitoring of Gaseous Emissions from Thermal Power Generation) or any other method that complies with requirements under applicable legislation, permits or agreements with provincial regulatory authorities.</p>
<p><b>Mass Balance:</b> Sulphur mass balance calculations should be conducted, at a minimum, on a monthly basis, and records of the results kept.</p>



## **Particulate Matter**

**Measurement:** Particulate matter emissions measurement could be done by source testing, Continuous Emissions Monitoring (CEM) or a combination of the two. Where source testing and CEM is not operationally feasible, other methodologies, as identified in Annex 1, may be used.

**Methodology:** Any of the following standard methods should be used for source testing:

- Environment Canada's EPS/1/RM/8 (Standard Reference Method for Source Testing: Measurement of Releases of Particulate Matter from Stationary Sources);
- Environment Canada's EPS 1/RM/55 (Reference Method for Source Testing: Measurement of Releases of Fine Particulate Matter from Stationary Sources);
- US EPA Method 5: Determination of Particulate Emissions from Stationary Sources
- Ontario Source Testing Code, Method 5: Determination of Particulate Emissions from Stationary Sources;
- Alberta Stack Sampling Code;
- Any other method that complies with requirements under applicable legislation, permits or agreements with provincial regulatory authorities.

For measurement by a Continuous Emissions Monitoring System (CEMS), it is expected that the CEMS would have, at a minimum:

- Correlation by source testing on a regular basis according to Environment Canada's EPS 1/RM/8, or any other equivalent method.

**Frequency:** Source testing should be performed, at a minimum, according to the frequency specified in Table 1 of Annex 1.

## **Particulate Matter Emission Intensity**

**Materiality of Products:** For calculating PM emission intensity, a facility may exclude a product or products from the denominator without adjusting the numerator, only if this exclusion does not alter the emission intensity value by greater than 1%.

**ANNEX 3:  
QUANTIFICATION AND ANNUAL REPORTING OF SO<sub>2</sub> AND PM**

EC will provide a template for:

- sulphur mass balance and sulphur capture calculations and reporting;
- particulate matter emission intensity calculations and reporting.

The template may be updated from time to time. Glencore will be given sufficient time to review and provide comments on the updated version.

**ANNEX 4:  
IMPLEMENTATION OF CODE OF PRACTICE**

As part of the annual report for each facility, Glencore will provide information regarding the implementation of the Code of Practice.

In the first year, Glencore will provide a summary of the recommendations that have been implemented at each of its facilities, and a summary of recommendations that are not applicable, according to the following table.

<b>Recommendations that have been Implemented</b>			
Recommendation	Description of what was done	When	Estimated change in emissions*, where appropriate
<b>Recommendations that are Not Applicable</b>			
Recommendation	Rationale for Not Applicable		

\*A qualitative description is acceptable, if a quantitative estimate is not possible.

In the first year and each year thereafter, Glencore will report on the recommendations that have yet to be implemented at each facility using Appendix B of the Code of Practice.

Glencore should provide, if needed, any additional information on each recommendation.

After the first annual report, for a facility which has fully implemented all of the applicable recommendations in the Code of Practice, Glencore will only be required to submit a summary every 3 years (e.g. highlight any improvements which have further reduced emissions) for that facility.

## **ANNEX 5: VERIFICATION PROTOCOL FOR THE BMS PERFORMANCE AGREEMENTS**

### **1.0 Verification Objectives and Scope**

This Protocol establishes verification procedures for the third party verification of the requirements of the Performance Agreement between Environment Canada and individual companies in the Base Metals Sector for the implementation of the Base Level Industrial Emissions Requirements (BLIERs). It also outlines the roles of the verifier and the signatories of the agreement. The objective of the verification is to confirm that the emissions data reported by Glencore for each of its facilities reasonably reflect actual circumstances and that the requirements outlined under Section 10 of this Agreement have been followed in computing and reporting the results.

The scope of the verification is limited to:

- the review and confirmation of the data utilized towards achieving the risk management objectives outlined under 9.1 of this Agreement;
- objective assessment of the proper applications of quantification methodologies and reporting, and documentation requirements outlined under the subsections of 10.1, 10.2, 10.4 and 10.6 of this Agreement;
- an evaluation and assessment that the weighing, sampling testing and quantification methodologies applied to determine the sulphur capture rate and particulate matter emissions at the facility:
  - were performed according to provisions outlined under Section 10 of this Agreement;
  - conform to the facility's documented procedures and reference manuals.

### **2.0 Roles and Roles and Responsibilities**

The **verifier** or **verification team** will visit each facility, review and evaluate data/documents related to emissions measurement and quantification to prepare a verification report for that facility.

Glencore will make every possible effort to make available, for each of its facilities, all pertinent documents, and information needed to conduct the verification, including, but not limited to:

- emission monitoring testing data including process operating conditions during the testing;
- log-books, process descriptions, flow sheets and reference manuals;
- equipment performance and maintenance records.

Glencore will provide access to employees and individuals within the company to seek further information, if needed.

**Environment Canada** will:

- review the verification report; and
- contact Glencore for clarification, as needed.

### 3.0 Qualifications of the Third Party Verifier or Verification Team

The verifier or verification team (if more than one) is an entity that verifies and provides assurance of the quality of emission testing and quantification of data.

The verifier or a member of the team must have:

- a degree in engineering, environmental science, environmental management or related discipline, and a minimum of five years of demonstrated work experience in performing emissions audits/verifications in industrial installations, and preparing verification/audit reports;
- certification as an Environmental Professional specialized as a Compliance, Environmental Auditor (EP(CEA));
- A good understanding of:
  - the base metal sector and the basics of smelting and refining processes, operations and functions of equipment utilized in the processes, potential sources of emissions, good knowledge of emissions estimation and quantification methodologies and techniques;
  - source testing methodologies and specifications;
  - Continuous Emissions Monitoring Systems (CEMS), and their operations, if used as part of the facility's testing and quantification methodology.

### 4.0 Verification Process

The verification activities will consist of the following main parts:

#### 4.1 Information Gathering

Before, after and during the on-site visit, the verification team will gather documents pertinent to the verification process.

#### 4.2 On-Site Visit and Document Review:

The verification team will visit the site to conduct the verification. The verification team will review all relevant documents, including but not limited to the following:

- process flow-sheets, sulphur mass balance, particulate matter emissions determinations procedure/reference manuals;
- procedures for data collection, processing and calculations;
- reported data and information to ascertain completeness, consistency over time, and performance against targets;
- emission monitoring or testing results;
- raw data used for calculations and any documentation deemed necessary to verify the total emissions from the facility (e.g. quantity of sulphur input and sulphur captured);
- procedures for estimation of annual production levels;
- measurement techniques utilized, and release quantification methodologies applied.

The verification team will also:

- cross check data provided with emission sources (e.g. stacks, point sources), the number of sources and the corresponding source's specific ID or other identifier (e.g. numeric, alpha-numeric ID or source name);
- conduct field observation of selected pertinent activities and sources for which the collected data applies;

- document additional data and information obtained through provisions of supplemental documentation or, if needed, through interviews of facility management or staff. Identify any inaccuracies in the testing and quantification of emissions or missing data/information and other pertinent values related to the quantification process, and bring these issues to the attention of the responsible person in the facility and seek clarification and/or correction.

**4.3 Verification Report:**

The verification report summarizes the findings of the verification process and should, at a minimum, contain:

- an executive summary;
- key findings of the verification;
- observations on the overall techniques and procedures relating to data collection, emissions measurement techniques and quantification of emissions;
- an overall statement on completeness, soundness, and consistency of the data used to determine emission and production levels;
- a list of any errors that were identified for corrective action;
- any other specific observations relating to the procedures and practices employed that would have positive or negative impacts on the overall emissions testing and quantification methodologies and results;
- the date of verification;
- the names of the members of the verification team and the organization they represent.

The report should be submitted as outlined in in Section 12.0 of the Agreement.