Performance Agreement Concerning
Air Pollutants from the Iron Ore Pellet Sector
(Herein "Agreement")

Between

Her Majesty the Queen in Right of Canada, as represented by the Minister of the Environment
(Herein "Environment Canada" or "EC")

And

Iron Ore Company of Canada

ArcelorMittal Mining Canada G.P.

(Herein individually referred to as "Company" and collectively referred to as "Companies")

Also, each of the above individually referred to as "Party" and collectively as "Parties"

Preamble

WHEREAS the production of iron ore pellets involves the mining of iron ore from open pits, crushing and concentrating the ore into a concentrate, and finally pelletizing. In the pelletizing process, iron ore concentrate is rolled into balls (pellets) and hardened through thermal treatment in an induration furnace. The induration furnace is the primary source of emissions from this sector of sulfur dioxide (SO_2), inhalable particles with a diameter of 2.5 microns or less ($PM_{2.5}$), and oxides of nitrogen (NO_x);

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 Iron Ore Pellet Sector BLIERs were developed for SO_2, $PM_{2.5,}$ and NO_x;

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

AND WHEREAS the Parties share a common interest in continuing efforts to reduce atmospheric emissions of SO_2, $PM_{2.5,}$ and NO_x;

Therefore, the Parties hereby agree as follows:

1. PURPOSE

The purpose of this Agreement is for each Company to achieve and maintain the BLIERs for $PM_{2.5}$, SO_2, and NO_x as described in section 9 from its existing and new facilities in the Iron Ore Pellet (IOP) sector in Canada.

2. DEFINITIONS

Existing Facility: An iron ore pelletizing facility that produces iron ore pellets from iron ore concentrate using an induration furnace and began operation before the effective date of this Performance Agreement. Existing Facilities are listed below:

Company	Facility
Iron Ore Company of Canada	Carol Lake Project, Labrador City, Newfoundland and Labrador
ArcelorMittal Mining Canada G.P.	Port-Cartier, Québec

Existing Induration Furnace: An induration furnace commissioned before the effective date of this Performance Agreement.

New Facility: An iron ore pelletizing facility that produces iron ore pellets from iron ore concentrate using an induration furnace and commissioned on or after the effective date of this Performance Agreement.

New Induration Furnace: An induration furnace commissioned on or after the effective date of this Performance Agreement.

Pellet Production: Refers to net pellet production by the induration furnace**.**

Pellet Throughput: Refers to pellet production through the induration furnace and includes the recirculating load referred to as the hearth layer.

3. LEGAL STATUS

The Parties acknowledge that each of them is entering into this Agreement on a voluntary basis as a means to reduce atmospheric emissions from iron ore pelletizing operations in Canada, that this Agreement is not intended to create legally binding obligations on the Parties, and its breach by a Party will not result in any liability.

Without limiting the generality of the foregoing, nothing in this Agreement, namely Sections 9 (including Annex 2 and Annex 3), 10 and 12 or in reports and information provided by the Companies, shall be construed as (i) a warranty by any of the Companies that the atmospheric emissions targets and underlying objectives of the sections listed above will be met or (ii) an admission of liability by any of the Companies.

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

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

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

4. DURATION

The Agreement shall be effective as of the date of the Minister’s signature affixed to this Agreement and shall expire on June 1, 2026, unless terminated earlier in accordance with Section 5.

5. TERMINATION

The Parties may on mutual consent in writing, terminate this Agreement at any time. However, any 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 Parties. The provisions of Section 13 shall survive the termination of this Agreement.

6. 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 each of the Parties.

7. ASSIGNMENT AND SUCCESSORS

This Agreement will apply to the successors or assigns of the Companies.

8. UNDERSTANDINGS

In the event of the definitive closure of induration furnace operations at a Company's facility, the Company will be relieved of its responsibilities under this Agreement for the affected facility.

If the closure is not definitive (e.g. due to production idling, shutdowns, non-favourable market conditions, strikes, equipment failure, etc.), an understanding which takes into account the impact on the facility's production and its ability to schedule stack testing will be reached between the Company and Environment Canada.

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 this Agreement may be construed as having such an effect.

If the objectives and requirements of this Agreement are not being met, the Minister may determine if other measures, including regulations, are needed to further prevent or reduce impacts of air pollutants on human health or the environment.

Any company that produces iron ore pellets whose existing or new furnace or furnaces are not captured by this Agreement will be encouraged to capture this furnace or these furnaces by amending an existing Agreement or by signing a new agreement similar to this Agreement, to minimize the risk of environmental impacts of air pollutants.

9. RISK MANAGEMENT OBJECTIVES

SO_2 and $PM_{2.5}$

Each Company agrees to achieve and maintain the BLIERs performance objectives as described below for new and existing facilities:

Substance	Source	BLIERs Performance Objectives	Timeline
SO_2	New/Existing Induration Furnace	An induration furnace will combust fossil fuels whose sulphur content is less than or equal to 1.5% by weight at all times	This comes into effect within six months of the effective date of this Agreement for existing furnaces, and immediately for new furnaces.
$PM_{2.5}$	New Induration Furnace	An induration furnace will emit less than or equal to 20 grams of filterable $PM_{2.5}$ per tonne of pellet throughput.	This comes into effect immediately.
	Existing Induration Furnace	An induration furnace will emit less than or equal to 40 grams of filterable $PM_{2.5}$ per tonne of pellet throughput.	This comes into effect within six months of the effective date of this Agreement.

Alternative Approach to Meet the SO_2 Performance Objective

As an alternative to meeting the SO_2 performance objective, a Company may implement a technology or solution upon agreement with Environment Canada. The Company will need to demonstrate in detail to Environment Canada how the proposed alternative action will provide equivalent or better results than the SO_2 performance objective.

The testing, quantification, and reporting requirements of this Agreement may need to be revised depending on the action(s) to be taken by the Company. These revisions will be based on bilateral discussion and agreement between the Company and Environment Canada.

Approaches to Assess $PM_{2.5}$

For $PM_{2.5}$, the Company may elect to assess the performance of its furnaces against the performance objective either at the furnace level or at the facility level.

As indicated in the previous table, the performance objective for $PM_{2.5}$ at the furnace level for existing furnaces is 40g/t and for new furnaces is 20 g/t.

The calculation to determine the facility level $PM_{2.5}$ performance objective for both existing and new furnaces is as follows:

$$PO_F = \frac{\sum_{i=1}^{n} PO_i \times P_i}{\sum_{i=1}^{n} P_i}$$

Where:

PO_F = Facility-level $PM_{2.5}$ performance objective on a production weighted basis in grams of $PM_{2.5}$ per tonne of pellets produced (g/tonne) by all existing and new induration furnaces in operation during the calendar year.

PO_i = $PM_{2.5}$ performance objective in g/tonne of pellet throughput for induration furnace "i"

= 40 g/t for existing, and 20 g/t for new

P_i = Pellet production for the year for induration furnace "i".

n = Number of existing and new induration furnaces in operation at the facility during the calendar year.

NO_x

<u>NO_x Technical Working Group with Defined Objectives</u>

The Companies will jointly establish a NO_x technical working group comprised of their own members, partners they select, and EC and provincial representative(s). The partners may be selected from the private or public sector, to support the mandate of the NO_x technical working group. The NO_x technical working group's strategy and recommended action plan are outlined in Annex 1 of this Agreement. The broad mandate of this group will be to determine the main drivers of NO_x formation in the induration process, and to examine opportunities for NO_x reduction and/or control.

The technical working group will prepare a report with its findings and include recommendations for moving forward on NO_x emissions.

10. TESTING, QUANTIFICATION AND REPORTING

10.1 Testing and Quantification

Each company agrees to follow the testing and quantification requirements for the risk management objectives for SO_2 and $PM_{2.5}$ in accordance with Annex 2 of this Agreement.

10.2 Report Content and Format

Each Company agrees to produce individual annual reports for each of its facilities, pursuant to the "Testing and Quantification Requirements" outlined in Annex 2 and the reporting requirements as outlined in Annex 3 of this Agreement.

With respect to SO_2, the annual reports will include (but not be limited to), for fuels which were combusted in the induration furnaces, the following:

- the % by weight of sulphur content of each delivery of solid fuel for the year;
- the weighted average % sulphur content by weight of all the solid fuel used for the year;
- the % by weight of sulphur content of each delivery of liquid fuel for the year; and
- the weighted average % sulphur content by weight of all the liquid fuel used for the year.

With respect to $PM_{2.5}$, the annual reports will include (but not be limited to) the following furnace-level information covering the period of time during the sampling campaign(s):

- $PM_{2.5}$ emissions in grams of filterable $PM_{2.5}$ per unit time from the main stack of the furnace being sampled, for each of the three test runs;
- Throughput rates of the furnace being sampled in tonnes of pellets per unit time, for each of the three test runs;
- The 75^{th} percentile of the average hourly pellet production (or throughput; see Annex 2) rate from the previous three years in tonnes of pellets per hour;
- $PM_{2.5}$ emission intensities in grams of filterable $PM_{2.5}$ per tonne of pellet throughput for furnace being sampled, for each of the three test runs;
- The average emission intensity of the furnace being sampled in grams of filterable $PM_{2.5}$ per tonne of pellet throughput; and
- If multiple sampling campaigns occur, the average emission intensity of the sampling campaigns for the furnace in grams of filterable $PM_{2.5}$ per tonne of pellet throughput.

If the $PM_{2.5}$ performance is assessed against the facility-level performance objective, additional information would include:

- the total pellet production for the year for each induration furnace at the facility in tonnes of pellets per year;
- the calculated facility-level $PM_{2.5}$ performance objective on a production weighted basis in grams of filterable $PM_{2.5}$ per tonne of pellets produced by all induration furnaces in operation during the calendar year at the facility; and
- the actual facility-level $PM_{2.5}$ emission intensity on a production weighted basis in grams of filterable $PM_{2.5}$ per tonne of pellets produced by all induration furnaces in operation during the calendar year at the facility.

Annual Reports will also include information that is unique to the operation as required, for example, a description of circumstances regarding why an objective could not be met, or a description of work done which had a positive impact on air emissions.

Each Company will ensure that data used in the description of its respective results achieved under the Agreement are complete, accurate, measurable, and verifiable.

Each Company will submit all reports covering each calendar year of the Agreement no later than June 1 of the following year, starting with the effective date, to the following address:

Subject title: Iron Ore Pellet Performance Agreement
Regulatory Innovation and Management Systems
351 St. Joseph Blvd, 20th Floor,
Gatineau, Quebec
K1A 0H3
Canada
Phone: 1-844-580-3637

Or to ec.epa-epe.ec@canada.ca

10.3 Retention of Records

Each Company will retain all records related to this Agreement for the duration of this Agreement, plus five years, and make them available to Environment Canada upon request.

10.4 Public Report

Environment Canada will publish on its website (www.ec.gc.ca/epa-epe) progress reports based on reports received under this Agreement.

Environment Canada will give the Companies a reasonable opportunity to review and comment on draft progress reports before their publication. The Companies will conduct this review and respond back to Environment Canada within a reasonable period of time.

11. VERIFICATION

Environment Canada will review the annual reports and will assess progress made under this Agreement. Environment Canada may request additional information if necessary. Environment Canada may perform additional verification by means of Company personnel interviews, site visits, and verification of records.

12. ROLES AND RESPONSIBILITIES

Each Company agrees to:

- Achieve the performance objectives outlined in Section 9.0 of this Agreement;

- Report to EC pursuant to Section 10.0 of this Agreement;
- Collaborate with EC during the verification process, and any resulting follow up actions;
- Maintain performance once the performance objectives have been achieved; and
- Participate in the NO_x technical working group

Environment Canada agrees to:

- Review sampling results and reports submitted by the Companies;
- Monitor progress under this Agreement, oversee its administration, and evaluate its effectiveness with respect to the Objectives and requirements;
- Publish reports on the Environment Canada website summarizing progress made under this Agreement; and
- Participate in the NO_x technical working group.

13. AVAILABILITY OF AGREEMENT AND INFORMATION

13.1 Public Report

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

13.2 Confidential Information

Environment Canada agrees to keep confidential and not disclose any confidential information obtained from a Company under this Agreement that has been identified as being confidential to the extent that a written request for confidentiality was 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.

Environment Canada agrees to ensure that confidential information of a Company is (a) not disclosed to the other Companies or to the public, (b) used solely for the purposes of this Agreement and (c) treated in confidence. Subject to Section 13.3, Environment Canada will follow established protocols when dealing with confidential information.

13.3 Access to Information

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.

14. 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)

The Iron Ore Company of Canada

By: _____
(print name)

Title:_____
(print title)

I represent and warrant that I am duly authorized to bind **The Iron Ore Company of Canada**

Signature:_____

Signed this _____day of _____, 2016

[if desired/required:]
In the presence of:_____

(signature)

ArcelorMittal Mining Canada G.P.

By: _____
(print name)

Title:_____
(print title)

I represent and warrant that I am duly authorized to bind **ArcelorMittal Mining Canada G.P.**

Signature: _____

Signed this _____day of _____, 2016

[if desired/required:]
In the presence of:_____
(signature)

ANNEX 1

NO_x Technical Working Group

Background

At the conclusion of the BLIER process, no BLIER was developed for NO_x due to uncertainty of NO_x as a priority for the sector and the need for a better understanding of NO_x formation in the induration furnace. The group agreed to form a technical working group whose primary mandate would be to determine the main drivers of NO_x formation in the induration process, and to examine opportunities for NO_x reduction and/or control.

Representation

The NO_x working group is to consist of representatives from the Companies, Environment Canada, the provinces, as well as other partners to provide technical and research support. These partners may originate from the private or public sector, to support the mandate of the NO_x technical working group.

The group will be chaired by an industry representative.

Mandate

The NO_x working group will have the following mandate:

- To determine the main drivers of NO_x formation in the induration process, and to examine opportunities for NO_x reduction and/or improved control.
- To prepare a report with the group's findings and include recommendations for moving forward on NO_x emissions.

Approach

The NO_x working group activities should include a complete review of practices related to NO_x emitted by pellet plants internationally.

In addition, the group would initiate a number of actions, specific to Canadian operations, which include items such as:

- Evaluation of practical and economically achievable NO_x abatement technologies which may include equipment/process modifications;
- Consideration of side effects related to NO_x reduction such as energy consumption; and,
- Pilot-scale testing where feasible.

The results of the investigations will be documented in a report, along with recommendations for moving forward on NO_x emissions.

Timeline

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

The NO_x working group report is to be completed within 3 to 4 years thereafter.

ANNEX 2

Iron Ore Pellet sector

Testing and Quantification Requirements

Requirements for the SO_2 BLIER	
SO_2 BLIER: The sulphur content in fuels combusted in the induration furnaces will be limited to 1.5% by weight at any time.	
Air Pollutant: SO_2	
Source: Induration furnace exhaust	
Solid and liquid fuels (for combustion in induration only)	
Sampling, Sample preparation, and Sample analysis	Sampling and sample preparation should be performed in accordance with generally accepted standards of good scientific practice. Sample analysis should be performed by a laboratory that is accredited to measure % sulphur in fuel in accordance with generally accepted standards of good scientific practice. Examples of published sampling, sample preparation, and sample analysis standards, which facilities may use, will be provided in the Reporting Template (see Annex 3).
Frequency of sampling	Sample and analyze each delivery of solid and liquid fuels to the facility to demonstrate that all of the fuels do not exceed 1.5% by weight of sulphur content. If the facility receives a quantity of fuel which exceeds the 1.5% sulphur content limit, blend this fuel with other quantities of fuel which have a sulphur content of less than 1.5%, to obtain a resulting fuel with a composite sulphur content not exceeding the BLIER limit. Demonstrate, in a manner acceptable to EC, that this blended quantity meets the requirements of the BLIER for sulphur content in solid and liquid fuels. For example, the calculation based on the weights of average lots used to feed the plant is an approach that the Companies may consider.
Requirements for the $PM_{2.5}$ BLIER	

$PM_{2.5}$ BLIER: Emissions from induration furnaces will be limited to 40 g/t for existing induration furnaces and to 20 g/t of pellets for new induration furnaces.	
Air pollutant: $PM_{2.5}$	
Source: Induration furnace exhausts, namely $PM_{2.5}$ emissions from the main exhaust stacks.	
Emission Quantification	
Measurement of emissions from the induration exhaust stacks	Measure emissions of filterable $PM_{2.5}$ from the induration furnace exhaust stacks by means of: • U.S. EPA Method 201A: Determination of PM_{10} and $PM_{2.5}$ Emissions from Stationary Sources (Constant Sampling Rate Procedure); or • Environment Canada's "Reference Method for Source Testing: Measurement of Releases of Fine Particulate Matter from Stationary Sources" (Reference Method EPS 1/RM/55). A minimum of three separate consecutive test runs are required for each stack being sampled. Determine the resulting emissions in grams per unit time from the stack by means of calculating a simple average of the three consecutive tests performed on that stack.
Frequency of stack sampling	Conduct stack sampling at each stack at a minimum frequency of once per calendar year. If more than one stack test campaign is conducted during the calendar year, compliance will be based on the arithmetic average of all valid stack tests performed during that calendar year.
Minimum Production* rate	
Minimum production* rate during stack sampling	During the stack sampling campaign, ensure that the hourly production rate of the furnace being tested is greater than the 75th percentile of the previous 36 months hourly production, excluding down times. If a facility's hourly production is calculated from data based on complete calendar months, use data from the 36 month period ending with the most recent complete month prior to stack sampling If stack sampling is scheduled during a period when the 75th percentile condition cannot be met, the path forward on stack sampling will be

	based on bilateral discussion and agreement between the Company and Environment Canada. * A facility may use “throughput” instead of “production” rate in this calculation, provided that it does so on a consistent basis.
Throughput Quantification – furnace-level assessment	
Pellet throughput rate during sampling	For the purpose of calculating instantaneous furnace-level throughput rate during stack testing, employ the facility-specific method of measuring the green pellet feed rates to the furnace during stack sampling. Adjust this number by applying a factor to account for losses due to evaporation and combustion, and then add the fixed hearth layer fraction specific to the facility.
Emission Intensity Calculation – furnace-level assessment	
Method of calculating furnace-level emission intensity	The furnace-level $PM_{2.5}$ emission intensity is calculated in terms of grams of filterable $PM_{2.5}$ emitted per tonne of pellet throughput. This approach can be expressed by the following equation: $$EI_i = \frac{\sum_{j=1}^{n} \frac{E_i}{T_i}}{n}$$ Where: EI_i = Average $PM_{2.5}$ emission intensity in g/tonne from induration furnace “i”, as determined from the average of all valid stack tests conducted during the calendar year. j = is the j^{th} valid stack test, where j goes from 1 to n and where n is the number of valid stack tests conducted on furnace i during the calendar year E_i = Total emissions from furnace “i” in grams of $PM_{2.5}$ during stack testing T_i = Pellet throughput in tonnes for furnace “i” during stack testing

Annual Production Quantification - facility-level	
Annual pellet production	For the purpose of calculating annual pellet production from each furnace, employ the facility-specific method of measuring the green pellet feed rates to the furnace over the year. Adjust this number by applying a factor to account for losses due to evaporation and combustion
Emission Intensity Calculation – facility-level assessment	
Method of calculating facility-level emission intensity	The facility-level $PM_{2.5}$ emission intensity is calculated in terms of grams of filterable particulate emitted per tonne of pellet production from all existing and new operating induration furnaces. This calculation will take into account stack emissions in grams of $PM_{2.5}$ as measured during the stack sampling campaign, pellet throughput in tonnes from all operating furnaces as measured during the stack sampling campaign, and total pellet production in tonnes from all existing and new furnaces during the calendar year. This approach can be expressed by the following equation: $$EI_F = \frac{\sum_{i=1}^{n} EI_i \times P_i}{\sum_{i=1}^{n} P_i}$$ Where: EI_F = Facility-level $PM_{2.5}$ emission intensity on a production weighted basis in grams of $PM_{2.5}$ per tonne of pellet production (g/tonne) by all induration furnaces in operation during the calendar year. EI_i = Average $PM_{2.5}$ emission intensity in g/tonne from induration furnace “i”, as determined from the average of all valid stack tests conducted during the calendar year. Pi = Total pellet production in tonnes for the calendar year for furnace “i”. n = Number of existing and new furnaces in operation at the facility during the calendar year.

ANNEX 3

The annual report will include information and results on the following for each facility:

- The sulphur content of the fuels combusted in all of the induration furnaces at the facility;

- The furnace-level $PM_{2.5}$ emission intensity for each furnace at the facility; and

- If applicable:
    - the calculated facility-level $PM_{2.5}$ performance objective for the facility, and
    - the actual facility-level $PM_{2.5}$ emission intensity for the facility.

EC will provide a reporting template to be used for reporting purposes. EC may update the reporting template from time to time. The Companies will be given sufficient time to review and provide comments on the updated version.