



STATE OF IDAHO  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor  
Toni Hardesty, Director

September 6, 2011

Mike Irish, VP Metallurgy/General Manager  
Essential Metals Corporation  
1098 Big Creek Rd.  
Kellogg, ID 83837

RE: Facility ID No. 079-00016, Essential Metals Corporation, Kellogg  
Final Permit Letter

Dear Mr. Irish:

The Department of Environmental Quality (DEQ) is issuing Permit to Construct (PTC) No. P-2011.0108 Project 60880 to Essential Metals Corporation for the cobalt production facility located at Kellogg. This PTC is issued in accordance with IDAPA 58.01.01.200 through 228 (Rules for the Control of Air Pollution in Idaho) and is based on the certified information provided in your PTC application received June 20, 2011.

This permit is effective immediately. This permit does not release Essential Metals Corporation from compliance with all other applicable federal, state, or local laws, regulations, permits, or ordinances.

Pursuant to the Construction and Operation Notification General Provision of your permit, it is required that construction and operation notification be provided. Please provide this information as listed to DEQ's Coeur d'Alene Regional Office, 2110 Ironwood Parkway, Coeur d'Alene, ID 83814, Fax: (208) 769-1404.

In order to fully understand the compliance requirements of this permit, DEQ highly recommends that you schedule a meeting with Almer Casile, Air Quality Analyst, at (208) 769-1422 to review and discuss the terms and conditions of this permit. Should you choose to schedule this meeting, DEQ recommends that the following representatives attend the meeting: your facility's plant manager, responsible official, environmental contact, and any other staff responsible for day-to-day compliance with permit conditions.

Pursuant to IDAPA 58.01.23, you, as well as any other entity, may have the right to appeal this final agency action within 35 days of the date of this decision. However, prior to filing a petition for a contested case, I encourage you to contact Carole Zundel at (208) 373-0502 or [carole.zundel@deq.idaho.gov](mailto:carole.zundel@deq.idaho.gov) to address any questions or concerns you may have with the enclosed permit.

Sincerely,

A handwritten signature in blue ink that reads "Mike Simon".

Mike Simon  
Stationary Source Program Manager  
Air Quality Division

MS\CZ

Permit No. P-2011.0108 PROJ 60880

Enclosures

<p style="text-align: center;"><b>Air Quality</b> <b>PERMIT TO CONSTRUCT</b> <b>State of Idaho</b> <b>Department of Environmental Quality</b></p>	<b>PERMIT NUMBER</b>	<b>CLASS</b>	<b>SIC</b>
	P-2011.0108	B	3331
	<b>FACILITY ID</b>	<b>AQCR</b>	<b>NAICS</b>
	079-00016	62	331419
	<b>UTM ZONE</b>	<b>UTM COORDINATES (km)</b>	
11	570.3 Easting	5263.0 Northing	
<b>PERMITTEE</b>			
Essential Metals Corporation			
<b>PROJECT</b>			
PROJECT No. 60880 Initial Permit			
<b>MAILING ADDRESS</b>	<b>CITY</b>	<b>STATE</b>	<b>ZIP</b>
1098 Big Creek Road	Kellogg	ID	83837
<b>FACILITY CONTACT</b>	<b>TITLE</b>	<b>TELEPHONE</b>	
Preston Rufe	Environmental Manager	(208) 756-4578 Ext. 24	
<b>RESPONSIBLE OFFICIAL</b>	<b>TITLE</b>	<b>TELEPHONE</b>	
Mike Irish	VP Metallurgy/General Manager	(208) 783-2691 Ext. 22	
<b>EXACT PLANT LOCATION</b>		<b>COUNTY</b>	
1098 Big Creek Road, Kellogg		Shoshone	
<b>GENERAL NATURE OF BUSINESS &amp; KINDS OF PRODUCTS</b>			
Extraction of copper, cobalt, and other products from concentrated ore through electrowinning			
<b>PERMIT AUTHORITY</b>			
<p>This permit is issued according to the Rules for the Control of Air Pollution in Idaho, IDAPA 58.01.01.200 through 228, and pertains only to emissions of air contaminants regulated by the state of Idaho and to the sources specifically allowed to be constructed or modified by this permit.</p> <p>This permit (a) does not affect the title of the premises upon which the equipment is to be located; (b) does not release the permittee from any liability for any loss due to damage to person or property caused by, resulting from, or arising out of the design, installation, maintenance, or operation of the proposed equipment; (c) does not release the permittee from compliance with other applicable federal, state, tribal, or local laws, regulations, or ordinances; (d) in no manner implies or suggests that the Department of Environmental Quality (DEQ) or its officers, agents, or employees, assume any liability, directly or indirectly, for any loss due to damage to person or property caused by, resulting from, or arising out of design, installation, maintenance, or operation of the proposed equipment.</p> <p>This permit will expire if construction has not begun within two years of its issue date or if construction is suspended for one year.</p> <p>This permit has been granted on the basis of design information presented with its application. Changes in design, equipment or operations may be considered a modification. Modifications are subject to DEQ review in accordance with IDAPA 58.01.01.200 through 228 of the Rules for the Control of Air Pollution in Idaho.</p>			
 <b>CAROLE ZUNDEL, PERMIT WRITER</b>		<b>DATE ISSUED</b>	September 6, 2011
 <b>MIKE SIMON, STATIONARY SOURCE MANAGER</b>			

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## PERMIT TO CONSTRUCT SCOPE

### *Purpose*

1. This is the initial permit to construct a cobalt production facility.
2. The emission sources regulated by this permit are listed in the following table.

Table 1 REGULATED SOURCES

Source Descriptions	Emission Controls
Autoclaves, Noram	None
Cu Electrowinning Process	Cu EW Circuit Scrubber
Co Electrowinning Process	Co EW Circuit Scrubber
Lime Silo	Lime Silo Dust Collector
Leach Reactor Crystallizer	Cooling Tower
MgO Silo	MgO Silo Dust Collector
Plant	Plant Ventilation Scrubber
Space Heaters, 5 MMBtu (combined) natural gas fired	None

# COBALT PRODUCTION FACILITY

## Process Description

### 3. Process Description

The primary objective of the Cobalt Production Facility (CPF) is to produce super-alloy grade Cobalt for sale to the aerospace, renewable energy, and chemical industries. In addition, there are several secondary products produced in the CPF. The CPF employs a hydrometallurgical process to recover cobalt (Co), copper (Cu), gold (Au), and other metals from a bulk concentrate produced at the Idaho Cobalt Mine.

Water, acid and oxygen at elevated temperature and pressure in an autoclave (similar to a pressure cooker) is used to dissolve metals in a sulfuric acid solution. Primary products are then extracted from the solution through electrowinning Cu and Co. Additionally, Nickel (Ni) and Zinc (Zn) metal salts are recovered as minor products. The sulfuric acid is then reacted with magnesium oxide (MgO) to produce magnesium sulfate (MgSO<sub>4</sub>). Because the leach reaction generates heat which is used to evaporate water, the CPF operates as a zero liquid discharge facility.

The leach residue (material that does not go into solution) consists of gold, clays, silica and other elements that do not dissolve. Gold is recovered from the leach residue using a chelating leach process. The remaining leach residue is then placed in the Leach Residue Repository (LRR) and permanently stored in a lined facility within geotextile tubes (similar to very large sandbags that are securely closed on all sides) called geotubes. The resulting solids are inert and very stable in the environment.

### 4. Emission Controls Description

Table 2 COBALT PRODUCTION FACILITY DESCRIPTION

Emissions Units / Processes	Emission Control Devices
Autoclaves, Noram	None
Cu Electrowinning Process	Cu EW Circuit Scrubber
Co Electrowinning Process	Co EW Circuit Scrubber
Lime Silo	Lime Silo Dust Collector
Leach Reactor Crystallizer	Cooling Tower
MgO Silo	MgO Silo Dust Collector
Plant	Plant Ventilation Scrubber
Space Heaters	None

## Emission Limits

### 5. Noram NO<sub>x</sub> Emission Limit

The NO<sub>x</sub> emissions from the Noram stack shall not exceed 0.9 lb/hr as determined by a test method prescribed by IDAPA 58.01.01.157, EPA reference method, or DEQ approved alternative.

### 6. Opacity Limit

The permittee shall not discharge any air pollutant to the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any 60-minute period which is greater than 20% opacity as determined by procedures contained in IDAPA 58.01.01.625. These provisions shall not apply when the presence of uncombined water, nitrogen oxides, and/or chlorine gas is the only reason for the failure of the emission to comply with the requirements of this section.

## **Operating Requirements**

### 7. Throughput Limits

The total throughput of concentrate, on a 0% moisture dry basis, into all autoclaves, is limited to 2.38 tons per hour.

### 8. Dust Collectors

Dust collectors shall be used to control PM emissions from the following sources:

- Lime silo
- MgO silo

### 9. Dust Collector O&M

Within 60 days of initial start-up, the permittee shall have developed a dust collector operation and maintenance (O&M) manual for the inspection and operation of the dust collectors which control emissions from the lime and MgO silos. The dust collector O&M manual shall be a permittee-developed document independent of the manufacturer supplied operating manual but may include summaries of procedures included in the manufacturer supplied operating manual.

The dust collector O&M manual shall describe the procedures that will be followed to comply with General Provision 16.

At a minimum the document shall include:

- Procedures to determine if bags or cartridges are ruptured; and
- Procedures to determine if bags or cartridges are not appropriately secured in place.

The Permittee shall maintain records of the results of each dust collector inspection in accordance with General Provision 23.

The dust collector O&M manual shall remain on site at all times and shall be made available to DEQ representatives upon request.

### 10. Scrubbers shall be used to control PM emissions from the Co and Cu EW circuits at all times the EQ circuits are in operation.

### 11. Scrubbers for EW Circuits O&M

Within 60 days of initial start-up, the permittee shall have developed an O&M manual for the scrubbers which control emissions from the Cobalt and Copper electrowinning circuits. The scrubber O&M manual shall be a permittee-developed document independent of the manufacturer supplied operating manual but may include summaries of procedures included in the manufacturer supplied operating manual.

The scrubber O&M manual shall describe the procedures that will be followed to comply with General Provision 16.

At a minimum the document shall include:

- Scrubbing media flow rate in gallons per minute
- Pressure drop across scrubber in inches of water

The Permittee shall maintain records of the results of each scrubber inspection in accordance with General Provision 23.

The scrubber O&M manual shall remain on site at all times and shall be made available to DEQ representatives upon request.

## ***Monitoring and Recordkeeping Requirements***

### 12. Throughput Monitoring

The permittee shall monitor and record, in tons per hour, the throughput of concentrate into the autoclaves once per hour when operating.

### 13. Opacity Monitoring

The permittee shall conduct a quarterly facility-wide inspection of potential sources of visible emissions, during daylight hours and under normal operating conditions. The inspection shall consist of a see/no see evaluation for each potential source of visible emissions. If any visible emissions are present from any point of emission, the permittee shall either

a) take appropriate corrective action as expeditiously as practicable to eliminate the visible emissions. Within 24 hours of the initial see/no see evaluation and after the corrective action, the permittee shall conduct a see/no see evaluation of the emissions point in question. If the visible emissions are not eliminated, the permittee shall comply with b).

or

b) perform a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625. A minimum of 30 observations shall be recorded when conducting the opacity test. If opacity is greater than 20%, as measured using Method 9, for a period or periods aggregating more than three minutes in any 60-minute period, the permittee shall take all necessary corrective action and report the exceedance in accordance with IDAPA 58.01.01.130-136.

The permittee shall maintain records of the results of each visible emission inspection and each opacity test when conducted. The records shall include, at a minimum, the date and results of each inspection and test and a description of the following: the permittee's assessment of the conditions existing at the time visible emissions are present (if observed), any corrective action taken in response to the visible emissions, and the date corrective action was taken.

## ***Performance Testing Requirements***

### 14. NO<sub>x</sub> Performance Test

Within 180 days of initial start-up, the permittee shall conduct a performance test on the Noram unit to assess compliance with the Noram NO<sub>x</sub> Emission Limit. The test shall be conducted in accordance with the performance testing requirements specified in the general provisions of this permit.

## PERMIT TO CONSTRUCT GENERAL PROVISIONS

### **General Compliance**

15. The permittee has a continuing duty to comply with all terms and conditions of this permit. All emissions authorized herein shall be consistent with the terms and conditions of this permit and the Rules for the Control of Air Pollution in Idaho. The emissions of any pollutant in excess of the limitations specified herein, or noncompliance with any other condition or limitation contained in this permit, shall constitute a violation of this permit and the Rules for the Control of Air Pollution in Idaho, and the Environmental Protection and Health Act, Idaho Code §39-101, et seq.
- [Idaho Code §39-101, et seq.]**
16. The permittee shall at all times (except as provided in the Rules for the Control of Air Pollution in Idaho) maintain in good working order and operate as efficiently as practicable, all treatment or control facilities or systems installed or used to achieve compliance with the terms and conditions of this permit and other applicable Idaho laws for the control of air pollution.
- [IDAPA 58.01.01.211, 5/1/94]**
17. Nothing in this permit is intended to relieve or exempt the permittee from the responsibility to comply with all applicable local, state, or federal statutes, rules and regulations.
- [IDAPA 58.01.01.212.01, 5/1/94]**

### **Inspection and Entry**

18. Upon presentation of credentials, the permittee shall allow DEQ or an authorized representative of DEQ to do the following:
- Enter upon the permittee's premises where an emissions source is located or emissions related activity is conducted, or where records are kept under conditions of this permit;
  - Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;
  - Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and
  - As authorized by the Idaho Environmental Protection and Health Act, sample or monitor, at reasonable times, substances or parameters for the purpose of determining or ensuring compliance with this permit or applicable requirements.
- [Idaho Code §39-108]**

### **Construction and Operation Notification**

19. The permittee shall furnish DEQ written notifications as follows in accordance with IDAPA 58.01.01.211:
- A notification of the date of initiation of construction, within five working days after occurrence; except in the case where pre-permit construction approval has been granted then notification shall be made within five working days after occurrence or within five working days after permit issuance whichever is later;
  - A notification of the date of any suspension of construction, if such suspension lasts for one year or more;
  - A notification of the anticipated date of initial start-up of the stationary source or facility not more than sixty days or less than thirty days prior to such date; and

- A notification of the actual date of initial start-up of the stationary source or facility within fifteen days after such date.

[IDAPA 58.01.01.211, 5/1/94]

### ***Performance Testing***

20. If performance testing (air emissions source test) is required by this permit, the permittee shall provide notice of intent to test to DEQ at least 15 days prior to the scheduled test date or shorter time period as approved by DEQ. DEQ, at its option, may have an observer present at any emissions tests conducted on a source. DEQ requests that such testing not be performed on weekends or state holidays.
21. All performance testing shall be conducted in accordance with the procedures in IDAPA 58.01.01.157. Without prior DEQ approval, any alternative testing is conducted solely at the permittee's risk. If the permittee fails to obtain prior written approval by DEQ for any testing deviations, DEQ may determine that the testing does not satisfy the testing requirements. Therefore, at least 30 days prior to conducting any performance test, the permittee is encouraged to submit a performance test protocol to DEQ for approval. The written protocol shall include a description of the test method(s) to be used, an explanation of any or unusual circumstances regarding the proposed test, and the proposed test schedule for conducting and reporting the test.
22. Within 30 days following the date in which a performance test required by this permit is concluded, the permittee shall submit to DEQ a performance test report. The written report shall include a description of the process, identification of the test method(s) used, equipment used, all process operating data collected during the test period, and test results, as well as raw test data and associated documentation, including any approved test protocol.

[IDAPA 58.01.01.157, 4/5/00]

### ***Monitoring and Recordkeeping***

23. The permittee shall maintain sufficient records to ensure compliance with all of the terms and conditions of this permit. Records of monitoring information shall include, but not be limited to the following: (a) the date, place, and times of sampling or measurements; (b) the date analyses were performed; (c) the company or entity that performed the analyses; (d) the analytical techniques or methods used; (e) the results of such analyses; and (f) the operating conditions existing at the time of sampling or measurement. All monitoring records and support information shall be retained for a period of at least five years from the date of the monitoring sample, measurement, report, or application. Supporting information includes, but is not limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation and copies of all reports required by this permit. All records required to be maintained by this permit shall be made available in either hard copy or electronic format to DEQ representatives upon request.

[IDAPA 58.01.01.211, 5/1/94]

### ***Excess Emissions***

24. The permittee shall comply with the procedures and requirements of IDAPA 58.01.01.130-136 for excess emissions due to startup, shutdown, scheduled maintenance, safety measures, upsets and breakdowns.

[IDAPA 58.01.01.130-136, 4/5/00]

### ***Certification***

25. All documents submitted to DEQ, including, but not limited to, records, monitoring data, supporting information, requests for confidential treatment, testing reports, or compliance certification shall contain a certification by a responsible official. The certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.

[IDAPA 58.01.01.123, 5/1/94]

***False Statements***

26. No person shall knowingly make any false statement, representation, or certification in any form, notice, or report required under this permit, or any applicable rule or order in force pursuant thereto.  
[IDAPA 58.01.01.125, 3/23/98]

***Tampering***

27. No person shall knowingly render inaccurate any monitoring device or method required under this permit or any applicable rule or order in force pursuant thereto.  
[IDAPA 58.01.01.126, 3/23/98]

***Transferability***

28. This permit is transferable in accordance with procedures listed in IDAPA 58.01.01.209.06.  
[IDAPA 58.01.01.209.06, 4/11/06]

***Severability***

29. The provisions of this permit are severable, and if any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.  
[IDAPA 58.01.01.211, 5/1/94]