



# **2017 Annual Report**



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ALS Global ASR Sampling Analysis Results



## ENVIRONMENTAL MONITORING

Industrial Metals operated in 2017 and recycled approximately 178,500 tonnes of scrap metal. In accordance with Clause 25 of the Environment Act Licence (No. 2856 RRRR), the following is an annual report of site operations as required by Manitoba Sustainable Development. This report includes details of the annual monitoring occurring at the Industrial Metals property. The following sections describe the results of the noise testing, air quality testing, soil testing, groundwater testing, and ASR testing.

### SECTION 1

#### Noise Monitoring

The Standard Operating Procedures and Monitoring Program includes four sites around the perimeter of the property that as representative locations for noise leaving the property. Industrial Metals' shredder maintenance manager conducted the noise level monitoring. As discussed with Manitoba Sustainable Development, noise levels, in decibels, were recorded using a digital sound level meter using an iPhone application. Noise levels at each location on the property were recorded several times during the day, in a sampling event. The average noise level for each location was determined. Sampling began in January 2017, and was completed monthly, during operating hours, while equipment was in use. The main point sources of outdoor noise production at the site include heavy equipment operation (backhoes, skid steers), the metal shredder, hauling trucks, metal placement, and the train transport. Results of the noise level monitoring during 2017 are summarized in the table below:

Date (2017)	Units	Sampling Location			
		North	West	South	East
January 20	dBA	69.7	72.1	70.4	80.1
February 23	dBA	68.8	72.5	70.1	79.5
March 24	dBA	71.3	72.5	71.3	79.9
April 19	dBA	70.3	70.9	67.8	81.6
May 25	dBA	69.1	71.4	69.9	80.4
June 26	dBA	72.2	70.3	69.9	88.8
July 21	dBA	70.0	69.8	73.4	82.4
August 23	dBA	78.4	78.4	80.2	85.8
September 21	dBA	101.1*	78.1	78.6	84.1



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Date (2017)	Units	Sampling Location			
		North	West	South	East
October 26	dBA	82.6*	76.5	79.4	90.7
November 22	dBA	85.9	71.8	72.9	91.8
December 18	dBA	73.6	74	72.7	85.7
<b>Yearly Average</b>	<b>dBA</b>	<b>76.1</b>	<b>73.2</b>	<b>73.1</b>	<b>84.2</b>

\*measurements occurred while train was operating onsite.

Sampling locations corresponded with the location plan attached to the Standard Operating Procedures and Monitoring Plan.

Industrial Metals received no noise complaints for the site in 2017.

**Noise Reduction Program**

Industrial Metals has taken the following steps to reduce noise levels on the property:

- Installed a noise reduction wall along the western edge of the shredder pad. The wall consisted of three-53 foot trailer sections placed end to end and stacked two high. The wall was approximately 160 feet long and 20 feet high.
- Informed suppliers of acceptable materials to be received onsite, such as those without combustible fuels and hazardous materials, which reduce the potential for explosions and other noise impacts
- Inspected incoming loads for potentially explosive materials and those materials not accepted are sent back with the suppliers
- Detected incoming loads for radiation at the scale before entering the site
- Maintained mechanical equipment onsite (i.e. material transport vehicles, material sorting equipment and the shredder) regularly
- Reduced explosive noises from the shredder operation by containing within the hammermill
- Continually maintained equipment at the site to reduce potential noise impacts
- Explored new methods for reducing noise impacts and explosion prevention technologies through supplier meetings and conferences attended by Industrial Metals staff.



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No loads were rejected from the site based on potentially explosive materials or radioactive materials.

**Shredder Explosions**

The following table is a summary of explosion events occurring at the shredder in 2016:

Date	Time	Description and Cause of Explosion	Outcome or Action Taken	Intensity * 1 - 10
3/5/17	1:38 pm	Small explosion in the shredder with a small visible flame. Cause unknown	The shredder operation continued. The flame was extinguished in seconds. No need for fire suppression or emergency services	2 - 3
31/5/17	11:16 am	Small explosion in the shredder with a small visible flame. Cause was a drum containing solvent of some type	The shredder operation continued. The flame was extinguished in seconds. No need for fire suppression or emergency services	2 - 3
8/6/17	9:58 am	Small explosion, barely audible with small fire. Cause was likely a small propane tank	The shredder operation continued. The flame was extinguished in seconds. No need for fire suppression or emergency services	3.5
3/10/17	1:30 pm	Small explosion with a small visible flame. Cause likely from a minivan with a small amount of fuel trapped in a fuel line	The shredder operation continued. The flame was extinguished in seconds. No need for fire suppression or emergency services	2.5
27/10/17	10:18 am	Midsized explosion with small visible fire. Nothing unusual being fed into shredder at the time of the incident, so cause unknown	The shredder operation continued. The flame was extinguished in seconds. No need for fire suppression or emergency services	4 - 5

\* Intensity Scale: 1 – audible with no visible fire;  
5 – audible with fire contained in the hammermill;  
10 – audible with fire visible outside the hammermill



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## **SECTION 2**

### **Air Quality and Monitoring**

The air quality is maintained at acceptable levels in the site buildings and around the perimeter of the property, in accordance with the Manitoba Ambient Air Quality Criteria and to the Environment Act Licence (No. 2856 RRRR). Monitoring air quality helps to determine if levels of air borne particulates exceed published levels, and if a potential threat to human and environmental health and safety exists. In accordance with the Manitoba Ambient Air Quality Guidelines, Maximum Acceptable Levels (MAL) are not to be exceeded in any urban centre including areas that are in the vicinity of industries with atmospheric emissions.

Dust emissions are minimized from the onsite operations, in accordance with the Environment Act Licence requirements, which include:

- the use of skirts on all drop chutes of the shredder
- the use of covered bins for ASR collection.

In addition, water is used to suppress dust from dry ground conditions onsite, if it becomes a nuisance to surrounding properties. During dry and windy periods during the summer of 2017a water truck was used for water spraying, to reduce dust production. Dates of site watering were not recorded. Industrial Metals received no complaints regarding air quality or dust production.

Baseline air quality sampling was conducted by Oswald Wohlgemut (Environmental Scientist at JR Cousin Consultants Ltd.) on July 6, 7, and 8, and included sampling three different sites on the property over 24 hour periods. Details on the results of the air quality testing were included in the Industrial Metals 2016 Annual Report.

A qualified environmental sampling firm will conduct additional air quality analysis during the summer of 2018. Results will be provided to Manitoba Sustainable Development upon completion.



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## **SECTION 3**

### **Soil Quality Monitoring**

Oswald Wohlgemut (Environmental Scientist at JR Cousin Consultants Ltd.) completed baseline soil quality sampling on January 11 and June 8, 2017. Three separate locations were tested at depths of 0.3 m below the surface and at 1.3 m to 1.5 m below the surface. The soil testing results were included in the Industrial Metals 2016 Annual Report.



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## **SECTION 4**

### **Groundwater Quality Monitoring**

Baseline groundwater quality sampling was conducted by Oswald Wohlgemut (Environmental Scientist at JR Cousin Consultants Ltd.) on January 11, 2017. The Industrial Metals property has a deep aquifer well for non-potable water, located in the shredder building. The results of this groundwater testing were included in the Industrial Metals 2016 Annual Report.



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## **SECTION 5**

### **ASR Sampling Analysis**

Approximately 15,764 metric tonnes of ASR waste were produced from the site in 2017. The shredder maintenance manager (personnel at Industrial Metals) conducted ASR sampling in February, April, July and October 2017. The ASR sampling was conducted in accordance with Attachment 'A' of the Environment Act Licence, which details volume of ASR and length of sampling time used to obtain representative samples. The samples were collected in glass jars supplied by the laboratory and were tested quarterly. The detailed laboratory analysis results are attached in the Appendix.

The laboratory analysis results were compared with contaminant threshold levels as identified in the Special Waste (Shredder Residue) Regulation 113/2003, and the Hazardous Waste Regulation 195/2015.



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The results of the ASR laboratory analysis are summarized in the table below:

Parameter Measured	Units	Reg 113/2003 Special Waste	Reg 195/2015 Leachate	February 2017	April 2017	July 2017	October 2017
Benzene (VOC)	mg/L		0.5	<0.025	<0.025	<0.025	<0.025
Ethylbenzene (VOC)	mg/L		0.24	<0.025	<0.025	<0.025	<0.025
Toluene (VOC)	mg/L		2.4	0.042	<0.025	<0.025	<0.025
Xylenes (VOC)	mg/L		30	0.111	<0.075	<0.075	<0.075
Polychlorinated Biphenyl (PCB)	mg/L	50		<0.0004	<0.0004	<0.0004	<0.0004
Arsenic	mg/L		2.5	<0.02	<0.02	<0.02	<0.02
Boron	mg/L		500	1.22	0.87	1.25	0.60
Cadmium	mg/L	15	0.5	0.157	0.154	0.141	0.033
Chromium	mg/L		5	<0.05	<0.05	<0.05	<0.05
Copper	mg/L			<0.05	<0.05	<0.05	1.21
Iron	mg/L			103	345	163	4.45
Lead	mg/L	15	5	0.219	3.25	0.24	8.17
Magnesium	mg/L			34.1	26.6	48.1	61.0
Mercury	mg/L		0.1	<0.01	<0.01	<0.01	<0.01
Nickel	mg/L			1.06	2.23	1.01	0.271
Tin	mg/L			<0.005	<0.005	<0.005	<0.005
Uranium	mg/L		10	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L			283	372	483	84



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Based on the results of the ASR analysis, there were no parameters that exceeded the regulations and would qualify the waste as a Hazardous Waste Material. Therefore, the ASR material was hauled to a Class 1 Waste Management Facility for final disposal.



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## **SECTION 6**

### **Public Correspondence:**

Industrial Metals did not receive any public complaints in 2017.

## **Appendix**

ALS Global ASR Sampling Analysis Results



Industrial Metals (2011)  
ATTN: JOSH CHISICK  
550 Messier Street  
Winnipeg MB R2J 0G5

Date Received: 09-FEB-17  
Report Date: 06-MAR-18 14:07 (MT)  
Version: FINAL REV. 2

Client Phone: 204-233-1908

## Certificate of Analysis

Lab Work Order #: L1888844  
Project P.O. #: NOT SUBMITTED  
Job Reference: INDUSTRIAL METALS - 550 MESSIER STREET  
C of C Numbers:  
Legal Site Desc:

Comments: 6-MAR-2018 AMENDED REPORT - Date sampled on CofC was incorrect - changed to 7-FEB-17

Hua Wo  
Chemistry Laboratory Manager

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## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1888844-1 ASR - 2							
Sampled By: CLIENT on 07-FEB-17							
Matrix: ASR							
<b>Leachate metals by TCLP</b>							
<b>Leachate prep TCLP</b>							
1st Preliminary pH	8.69		0.10	pH		16-FEB-17	R3655966
2nd Preliminary pH	3.17		0.10	pH		16-FEB-17	R3655966
Extraction Solution Initial pH	4.93		0.10	pH		16-FEB-17	R3655966
Final pH	6.41		0.10	pH		16-FEB-17	R3655966
<b>Miscellaneous Parameters</b>							
Mercury (Hg)-Total	<0.010		0.010	mg/L	16-FEB-17	24-FEB-17	R3661379
<b>Leachate Procedure for Reg 347</b>							
Initial pH	8.57		0.10	pH units		14-FEB-17	R3652943
Final pH	6.10		0.10	pH units		14-FEB-17	R3652943
<b>Total Metals by ICP-MS</b>							
Antimony (Sb)-Leachable	<0.050		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Arsenic (As)-Leachable	<0.020		0.020	mg/L	17-FEB-17	22-FEB-17	R3659719
Barium (Ba)-Leachable	0.938		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Beryllium (Be)-Leachable	<0.050		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Boron (B)-Leachable	1.22		0.50	mg/L	17-FEB-17	22-FEB-17	R3659719
Cadmium (Cd)-Leachable	0.157		0.0050	mg/L	17-FEB-17	22-FEB-17	R3659719
Calcium (Ca)-Leachable	381		0.50	mg/L	17-FEB-17	22-FEB-17	R3659719
Chromium (Cr)-Leachable	<0.050		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Cobalt (Co)-Leachable	0.130		0.020	mg/L	17-FEB-17	22-FEB-17	R3659719
Copper (Cu)-Leachable	<0.050		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Iron (Fe)-Leachable	103		0.50	mg/L	17-FEB-17	22-FEB-17	R3659719
Lead (Pb)-Leachable	0.219		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Magnesium (Mg)-Leachable	34.1		0.50	mg/L	17-FEB-17	22-FEB-17	R3659719
Manganese (Mn)-Leachable	7.46		0.0050	mg/L	17-FEB-17	22-FEB-17	R3659719
Molybdenum (Mo)-Leachable	<0.0050		0.0050	mg/L	17-FEB-17	22-FEB-17	R3659719
Nickel (Ni)-Leachable	1.06		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Potassium (K)-Leachable	11.3		0.50	mg/L	17-FEB-17	22-FEB-17	R3659719
Selenium (Se)-Leachable	<0.020		0.020	mg/L	17-FEB-17	22-FEB-17	R3659719
Silver (Ag)-Leachable	<0.050		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Strontium (Sr)-Leachable	1.35		0.0010	mg/L	17-FEB-17	22-FEB-17	R3659719
Thallium (Tl)-Leachable	<0.010		0.010	mg/L	17-FEB-17	22-FEB-17	R3659719
Tin (Sn)-Leachable	<0.0050		0.0050	mg/L	17-FEB-17	22-FEB-17	R3659719
Uranium (U)-Leachable	<0.0050		0.0050	mg/L	17-FEB-17	22-FEB-17	R3659719
Vanadium (V)-Leachable	<0.050		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
Zinc (Zn)-Leachable	283		10	mg/L	17-FEB-17	22-FEB-17	R3659719
Zirconium (Zr)-Leachable	<0.050		0.050	mg/L	17-FEB-17	22-FEB-17	R3659719
<b>BTEX for O. Reg 347</b>							
Benzene	<0.025	VTHS	0.025	mg/L		16-FEB-17	R3654211
Ethylbenzene	<0.025	VTHS	0.025	mg/L		16-FEB-17	R3654211
m+p-Xylenes	0.066	VTHS	0.050	mg/L		16-FEB-17	R3654211
o-Xylene	0.045	VTHS	0.025	mg/L		16-FEB-17	R3654211
Styrene	<0.025	VTHS	0.025	mg/L		16-FEB-17	R3654211
Toluene	0.042	VTHS	0.025	mg/L		16-FEB-17	R3654211
Xylenes (Total)	0.111		0.075	mg/L		16-FEB-17	R3654211
Surrogate: 4-Bromofluorobenzene	105.0		70-130	%		16-FEB-17	R3654211
<b>PCBs for O. Reg 347</b>							
Aroclor 1242	<0.00020		0.00020	mg/L	23-FEB-17	23-FEB-17	R3659744
Aroclor 1248	<0.00020		0.00020	mg/L	23-FEB-17	23-FEB-17	R3659744
Aroclor 1254	<0.00020		0.00020	mg/L	23-FEB-17	23-FEB-17	R3659744
Aroclor 1260	<0.00020		0.00020	mg/L	23-FEB-17	23-FEB-17	R3659744
Total PCBs	<0.00040		0.00040	mg/L	23-FEB-17	23-FEB-17	R3659744

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## Reference Information

### Sample Parameter Qualifier Key:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
VTHS	Volatile test was conducted on sample with headspace. Results may be biased low.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTX-TCLP-WT	Waste	BTEX for O. Reg 347	SW846 8260
HG-TCLP-CVAF-WP	Waste	Mercury Total by TCLP prep	EPA245.7 V2.0
Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.			
LEACH-TCLP-WT	Waste	Leachate Procedure for Reg 347	EPA 1311
Inorganic and Semi-Volatile Organic contaminants are leached from waste samples in strict accordance with US EPA Method 1311, "Toxicity Characteristic Leaching Procedure" (TCLP). Test results are reported in leachate concentration units (normally mg/L).			
MET-TCLP-MS-WP	Waste	Total Metals by ICP-MS	U.S. EPA 200.8-T
Total Metals by ICP-MS: This analysis is carried out using sample preparation procedures adapted from Standard Methods for the examination of Water and Wastewater Method 3030E and analytical procedures adapted from U.S EPA Method 200.8 for analysis of metals by inductively coupled-mass spectrometry.			

PCB-TCLP-WT	Waste	PCBs for O. Reg 347	SW846 8270
PREP-TCLP-INORG-WP	Waste	Leachate prep TCLP	EPA SW846 1311

The TCLP leachate method is used to characterize material based on the ability of contaminants to partition or leach into a simulated landfill solution. The leachate is designed to determine the mobility of contaminants present in liquid, solid and multiple phase samples under acidic conditions. This method may be applied to liquid samples, multiple phase samples and solid materials.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

### Chain of Custody Numbers:

### GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample  
 mg/kg wwt - milligrams per kilogram based on wet weight of sample  
 mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight  
 mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.





Industrial Metals (2011)  
ATTN: JOSH CHISICK  
550 Messier Street  
Winnipeg MB R2J 0G5

Date Received: 20-FEB-18  
Report Date: 28-FEB-18 11:01 (MT)  
Version: FINAL

Client Phone: 204-233-1908

## Certificate of Analysis

Lab Work Order #: L2058464  
Project P.O. #: NOT SUBMITTED  
Job Reference: INDUSTRIAL METALS - 550 MESSIER STREET  
C of C Numbers:  
Legal Site Desc:

  
\_\_\_\_\_  
Craig Riddell, B.Sc.Ag  
Account Manager

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## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2058464-1 ASR Q2							
Sampled By: CLIENT on 20-APR-17 @ 11:00							
Matrix: SOIL/WASTE							
<b>Leachate metals by TCLP</b>							
<b>Leachate prep TCLP</b>							
1st Preliminary pH	7.98		0.10	pH		22-FEB-18	R3968117
2nd Preliminary pH	3.19		0.10	pH		22-FEB-18	R3968117
Extraction Solution Initial pH	4.97		0.10	pH		22-FEB-18	R3968117
Final pH	6.11		0.10	pH		22-FEB-18	R3968117
<b>Mercury Total by TCLP prep</b>							
Mercury (Hg)-Total	<0.010		0.010	mg/L	22-FEB-18	23-FEB-18	R3969307
<b>Total Metals by ICP-MS</b>							
Antimony (Sb)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Arsenic (As)-Leachable	<0.020		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Barium (Ba)-Leachable	0.684		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Beryllium (Be)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Boron (B)-Leachable	0.87		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Cadmium (Cd)-Leachable	0.154		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Calcium (Ca)-Leachable	287		3.0	mg/L	23-FEB-18	23-FEB-18	R3969071
Chromium (Cr)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Cobalt (Co)-Leachable	0.133		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Copper (Cu)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Iron (Fe)-Leachable	345		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Lead (Pb)-Leachable	3.25		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Magnesium (Mg)-Leachable	26.6		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Manganese (Mn)-Leachable	8.76		0.010	mg/L	23-FEB-18	23-FEB-18	R3969071
Molybdenum (Mo)-Leachable	0.0087		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Nickel (Ni)-Leachable	2.23		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Potassium (K)-Leachable	12.2		1.5	mg/L	23-FEB-18	23-FEB-18	R3969071
Selenium (Se)-Leachable	<0.020		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Silver (Ag)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Strontium (Sr)-Leachable	1.22		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Thallium (Tl)-Leachable	<0.010		0.010	mg/L	23-FEB-18	23-FEB-18	R3969071
Tin (Sn)-Leachable	<0.0050		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Uranium (U)-Leachable	<0.0050		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Vanadium (V)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Zinc (Zn)-Leachable	372		10	mg/L	23-FEB-18	23-FEB-18	R3969071
Zirconium (Zr)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
<b>Leachate Procedure for Reg 347</b>							
Initial pH	7.76		0.10	pH units		26-FEB-18	R3970487
Final pH	6.06		0.10	pH units		26-FEB-18	R3970487
<b>BTEX for O. Reg 347</b>							
Benzene	<0.025		0.025	mg/L		27-FEB-18	R3971380
Ethylbenzene	<0.025		0.025	mg/L		27-FEB-18	R3971380
m+p-Xylenes	<0.050		0.050	mg/L		27-FEB-18	R3971380
o-Xylene	<0.025		0.025	mg/L		27-FEB-18	R3971380
Styrene	<0.025		0.025	mg/L		27-FEB-18	R3971380
Toluene	<0.025		0.025	mg/L		27-FEB-18	R3971380
Xylenes (Total)	<0.075		0.075	mg/L		27-FEB-18	R3971380
Surrogate: 4-Bromofluorobenzene	103.0		70-130	%		27-FEB-18	R3971380
<b>PCBs for O. Reg 347</b>							
Aroclor 1242	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1248	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1254	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1260	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## Reference Information

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTX-TCLP-WT	Waste	BTEX for O. Reg 347	SW846 8260
HG-TCLP-CVAF-WP	Waste	Mercury Total by TCLP prep	EPA245.7 V2.0
Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.			
LEACH-TCLP-WT	Waste	Leachate Procedure for Reg 347	EPA 1311
Inorganic and Semi-Volatile Organic contaminants are leached from waste samples in strict accordance with US EPA Method 1311, "Toxicity Characteristic Leaching Procedure" (TCLP). Test results are reported in leachate concentration units (normally mg/L).			
MET-TCLP-MS-WP	Waste	Total Metals by ICP-MS	U.S. EPA 200.8-T
Total Metals by ICP-MS: This analysis is carried out using sample preparation procedures adapted from Standard Methods for the examination of Water and Wastewater Method 3030E and analytical procedures adapted from U.S EPA Method 200.8 for analysis of metals by inductively coupled-mass spectrometry.			
PCB-TCLP-WT	Waste	PCBs for O. Reg 347	SW846 8270
PREP-TCLP-INORG-WP	Waste	Leachate prep TCLP	EPA SW846 1311
The TCLP leachate method is used to characterize material based on the ability of contaminants to partition or leach into a simulated landfill solution. The leachate is designed to determine the mobility of contaminants present in liquid, solid and multiple phase samples under acidic conditions. This method may be applied to liquid samples, multiple phase samples and solid materials.			

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

## Chain of Custody Numbers:

## GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.





Industrial Metals (2011)  
ATTN: JOSH CHISICK  
550 Messier Street  
Winnipeg MB R2J 0G5

Date Received: 20-FEB-18  
Report Date: 28-FEB-18 10:56 (MT)  
Version: FINAL

Client Phone: 204-233-1908

## Certificate of Analysis

Lab Work Order #: L2058461  
Project P.O. #: NOT SUBMITTED  
Job Reference: INDUSTRIAL METALS - 550 MESSIER STREET  
C of C Numbers:  
Legal Site Desc:

  
\_\_\_\_\_  
Craig Riddell, B.Sc.Ag  
Account Manager

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ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721  
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## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2058461-1 ASR Q3							
Sampled By: CLIENT on 13-JUL-17 @ 10:00							
Matrix: SOIL/WASTE							
<b>Leachate metals by TCLP</b>							
<b>Leachate prep TCLP</b>							
1st Preliminary pH	9.16		0.10	pH		22-FEB-18	R3968117
2nd Preliminary pH	3.82		0.10	pH		22-FEB-18	R3968117
Extraction Solution Initial pH	4.97		0.10	pH		22-FEB-18	R3968117
Final pH	6.37		0.10	pH		22-FEB-18	R3968117
<b>Mercury Total by TCLP prep</b>							
Mercury (Hg)-Total	<0.010		0.010	mg/L	22-FEB-18	23-FEB-18	R3969307
<b>Total Metals by ICP-MS</b>							
Antimony (Sb)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Arsenic (As)-Leachable	<0.020		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Barium (Ba)-Leachable	1.18		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Beryllium (Be)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Boron (B)-Leachable	1.25		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Cadmium (Cd)-Leachable	0.141		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Calcium (Ca)-Leachable	391		3.0	mg/L	23-FEB-18	23-FEB-18	R3969071
Chromium (Cr)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Cobalt (Co)-Leachable	0.154		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Copper (Cu)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Iron (Fe)-Leachable	163		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Lead (Pb)-Leachable	0.240		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Magnesium (Mg)-Leachable	48.1		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Manganese (Mn)-Leachable	11.3		1.0	mg/L	23-FEB-18	23-FEB-18	R3969071
Molybdenum (Mo)-Leachable	0.0077		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Nickel (Ni)-Leachable	1.01		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Potassium (K)-Leachable	13.8		1.5	mg/L	23-FEB-18	23-FEB-18	R3969071
Selenium (Se)-Leachable	<0.020		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Silver (Ag)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Strontium (Sr)-Leachable	1.47		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Thallium (Tl)-Leachable	<0.010		0.010	mg/L	23-FEB-18	23-FEB-18	R3969071
Tin (Sn)-Leachable	<0.0050		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Uranium (U)-Leachable	<0.0050		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Vanadium (V)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Zinc (Zn)-Leachable	483		10	mg/L	23-FEB-18	23-FEB-18	R3969071
Zirconium (Zr)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
<b>Leachate Procedure for Reg 347</b>							
Initial pH	8.44	LTIS	0.10	pH units		26-FEB-18	R3970487
Final pH	4.71	LTIS	0.10	pH units		26-FEB-18	R3970487
<b>BTEX for O. Reg 347</b>							
Benzene	<0.025	LTV	0.025	mg/L		27-FEB-18	R3971380
Ethylbenzene	<0.025	LTV	0.025	mg/L		27-FEB-18	R3971380
m+p-Xylenes	<0.050	LTV	0.050	mg/L		27-FEB-18	R3971380
o-Xylene	<0.025	LTV	0.025	mg/L		27-FEB-18	R3971380
Styrene	<0.025	LTV	0.025	mg/L		27-FEB-18	R3971380
Toluene	<0.025	LTV	0.025	mg/L		27-FEB-18	R3971380
Xylenes (Total)	<0.075		0.075	mg/L		27-FEB-18	R3971380
Surrogate: 4-Bromofluorobenzene	103.3		70-130	%		27-FEB-18	R3971380
<b>PCBs for O. Reg 347</b>							
Aroclor 1242	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1248	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1254	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1260	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## Reference Information

## Sample Parameter Qualifier Key:

Qualifier	Description
LTIS	Limited sample was available for TCLP or SPLP inorganics & semi-volatiles extraction (<100 grams). Extraction fluid volume &/or other elements of the method were scaled down proportionately to permit analysis. Test results from modified leach procedures may be unsuitable for regulatory purposes.
LTV	Limited sample was available for TCLP volatiles extraction (< 25 grams). Extraction fluid volume was scaled down proportionately to permit analysis. Test results from modified TCLP procedures may be unsuitable for regulatory purposes.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTX-TCLP-WT	Waste	BTEX for O. Reg 347	SW846 8260
HG-TCLP-CVAF-WP	Waste	Mercury Total by TCLP prep	EPA245.7 V2.0

Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.

LEACH-TCLP-WT	Waste	Leachate Procedure for Reg 347	EPA 1311
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Inorganic and Semi-Volatile Organic contaminants are leached from waste samples in strict accordance with US EPA Method 1311, "Toxicity Characteristic Leaching Procedure" (TCLP). Test results are reported in leachate concentration units (normally mg/L).

MET-TCLP-MS-WP	Waste	Total Metals by ICP-MS	U.S. EPA 200.8-T
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Total Metals by ICP-MS: This analysis is carried out using sample preparation procedures adapted from Standard Methods for the examination of Water and Wastewater Method 3030E and analytical procedures adapted from U.S EPA Method 200.8 for analysis of metals by inductively coupled-mass spectrometry.

PCB-TCLP-WT	Waste	PCBs for O. Reg 347	SW846 8270
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PREP-TCLP-INORG-WP	Waste	Leachate prep TCLP	EPA SW846 1311
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The TCLP leachate method is used to characterize material based on the ability of contaminants to partition or leach into a simulated landfill solution. The leachate is designed to determine the mobility of contaminants present in liquid, solid and multiple phase samples under acidic conditions. This method may be applied to liquid samples, multiple phase samples and solid materials.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

## Chain of Custody Numbers:

## GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.





Industrial Metals (2011)  
ATTN: JOSH CHISICK  
550 Messier Street  
Winnipeg MB R2J 0G5

Date Received: 20-FEB-18  
Report Date: 28-FEB-18 10:55 (MT)  
Version: FINAL

Client Phone: 204-233-1908

## Certificate of Analysis

Lab Work Order #: L2058458  
Project P.O. #: NOT SUBMITTED  
Job Reference: INDUSTRIAL METALS - 550 MESSIER STREET  
C of C Numbers:  
Legal Site Desc:

  
\_\_\_\_\_  
Craig Riddell, B.Sc.Ag  
Account Manager

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ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721  
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## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2058458-1 ASR Q4							
Sampled By: CLIENT on 26-OCT-17 @ 11:00							
Matrix: SOIL							
<b>Leachate metals by TCLP</b>							
<b>Leachate prep TCLP</b>							
1st Preliminary pH	9.17		0.10	pH		22-FEB-18	R3968117
2nd Preliminary pH	2.15		0.10	pH		22-FEB-18	R3968117
Extraction Solution Initial pH	4.97		0.10	pH		22-FEB-18	R3968117
Final pH	5.50		0.10	pH		22-FEB-18	R3968117
<b>Mercury Total by TCLP prep</b>							
Mercury (Hg)-Total	<0.010		0.010	mg/L	22-FEB-18	23-FEB-18	R3969307
<b>Total Metals by ICP-MS</b>							
Antimony (Sb)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Arsenic (As)-Leachable	<0.020		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Barium (Ba)-Leachable	1.51		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Beryllium (Be)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Boron (B)-Leachable	0.60		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Cadmium (Cd)-Leachable	0.0333		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Calcium (Ca)-Leachable	422		3.0	mg/L	23-FEB-18	23-FEB-18	R3969071
Chromium (Cr)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Cobalt (Co)-Leachable	0.023		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Copper (Cu)-Leachable	1.21		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Iron (Fe)-Leachable	4.45		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Lead (Pb)-Leachable	8.17		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Magnesium (Mg)-Leachable	61.0		0.50	mg/L	23-FEB-18	23-FEB-18	R3969071
Manganese (Mn)-Leachable	1.97		0.010	mg/L	23-FEB-18	23-FEB-18	R3969071
Molybdenum (Mo)-Leachable	<0.0050		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Nickel (Ni)-Leachable	0.271		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Potassium (K)-Leachable	4.1		1.5	mg/L	23-FEB-18	23-FEB-18	R3969071
Selenium (Se)-Leachable	<0.020		0.020	mg/L	23-FEB-18	23-FEB-18	R3969071
Silver (Ag)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Strontium (Sr)-Leachable	0.585		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Thallium (Tl)-Leachable	<0.010		0.010	mg/L	23-FEB-18	23-FEB-18	R3969071
Tin (Sn)-Leachable	<0.0050		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Uranium (U)-Leachable	<0.0050		0.0050	mg/L	23-FEB-18	23-FEB-18	R3969071
Vanadium (V)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
Zinc (Zn)-Leachable	84		10	mg/L	23-FEB-18	23-FEB-18	R3969071
Zirconium (Zr)-Leachable	<0.050		0.050	mg/L	23-FEB-18	23-FEB-18	R3969071
<b>Leachate Procedure for Reg 347</b>							
Initial pH	8.56		0.10	pH units		26-FEB-18	R3970487
Final pH	5.36		0.10	pH units		26-FEB-18	R3970487
<b>BTEX for O. Reg 347</b>							
Benzene	<0.025		0.025	mg/L		27-FEB-18	R3971380
Ethylbenzene	<0.025		0.025	mg/L		27-FEB-18	R3971380
m+p-Xylenes	<0.050		0.050	mg/L		27-FEB-18	R3971380
o-Xylene	<0.025		0.025	mg/L		27-FEB-18	R3971380
Styrene	<0.025		0.025	mg/L		27-FEB-18	R3971380
Toluene	<0.025		0.025	mg/L		27-FEB-18	R3971380
Xylenes (Total)	<0.075		0.075	mg/L		27-FEB-18	R3971380
Surrogate: 4-Bromofluorobenzene	100.8		70-130	%		27-FEB-18	R3971380
<b>PCBs for O. Reg 347</b>							
Aroclor 1242	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1248	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1254	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104
Aroclor 1260	<0.00020		0.00020	mg/L	28-FEB-18	28-FEB-18	R3972104

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## Reference Information

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTX-TCLP-WT	Waste	BTEX for O. Reg 347	SW846 8260
HG-TCLP-CVAF-WP	Waste	Mercury Total by TCLP prep	EPA245.7 V2.0
Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.			
LEACH-TCLP-WT	Waste	Leachate Procedure for Reg 347	EPA 1311
Inorganic and Semi-Volatile Organic contaminants are leached from waste samples in strict accordance with US EPA Method 1311, "Toxicity Characteristic Leaching Procedure" (TCLP). Test results are reported in leachate concentration units (normally mg/L).			
MET-TCLP-MS-WP	Waste	Total Metals by ICP-MS	U.S. EPA 200.8-T
Total Metals by ICP-MS: This analysis is carried out using sample preparation procedures adapted from Standard Methods for the examination of Water and Wastewater Method 3030E and analytical procedures adapted from U.S EPA Method 200.8 for analysis of metals by inductively coupled-mass spectrometry.			
PCB-TCLP-WT	Waste	PCBs for O. Reg 347	SW846 8270
PREP-TCLP-INORG-WP	Waste	Leachate prep TCLP	EPA SW846 1311
The TCLP leachate method is used to characterize material based on the ability of contaminants to partition or leach into a simulated landfill solution. The leachate is designed to determine the mobility of contaminants present in liquid, solid and multiple phase samples under acidic conditions. This method may be applied to liquid samples, multiple phase samples and solid materials.			

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WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

## Chain of Custody Numbers:

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mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

