MAGNITUDE 7 METALS LLC

Summary Report for ERT

METHOD 14 LINE 2

Run Number 1 POM 2/23/2021 EPA Method # 315

AVG. ALUMINUM PRODUCTION RATE	9.83	TON/HR./LINE
PROCESS DATA CORRECTION FACTOR FOR ROOF EMISSIONS FROM POM (LB/HR)	0.001905	FACTOR
% ISOKINETIC (MANIFOLD to ROOF)	106.5	%
% ISOKINETIC (MANIFOLD to ROOF) CORRECTION FACTOR		

TOTAL POM COLLECTED	8.30	MG
POM CORRECTED FOR %ISOKINETIC > 120		
SECONDARY POM CONCENTRATION	1.33E-04	GRAINS/SCF
SECONDARY POM CONCENTRATION	1.75E-03	LBS./HR.
SECONDARY POM CONCENTRATION	1.78E-04	LBS./TON
SECONDARY POM EMISSION	9.026	LBS./HR.
SECONDARY POM EMISSION	0.918	LBS./TON
SECONDARY POM EMISSION USING CORRECTION FACTOR	0.918	LBS./TON
PRIMARY POM EMITTED	0.191	LBS./TON
TOTAL PRIMARY AND SECONDARY POM EMITTED	1.109	LBS./TON

MAGNITUDE 7 METALS LLC

METHOD 14 SAMPLE RESULTS

LINE 2

Run Number 1 POM 2/23/2021 - 2/24/2021 EPA Method # 315

METER VOLUME	979.110	CU. FT.
SQUARE ROOT OF DELTA P	0.373	SQ. ROOT IN. WATER
AVERAGE DELTA H	1.643	IN. WATER
METERED GAS TEMPERATURE	74.0	DEG. F
STATIC PRESSURE IN STACK	-0.53	IN. WATER
STACK TEMPERATURE	85.8	DEG. F
BAROMETRIC PRESSURE	29.62	IN. Hg
PROBE TIP DIAMETER	0.3229	INCHES
GAS METER CORRECTION FACTOR	0.997	
TOTAL SAMPLING TIME	1395.0	MINUTES
TOTAL WATER COLLECTED	129.0	GRAMS
MOLECULAR WEIGHT	28.8	LB/LB-MOLE
SAMPLING DUCT AREA	1.25	SQ. FT.
TOTAL MCEM COLLECTED	8.30	MG
AVG ALUMINUM PRODUCTION RATE	471856	LBS./DAY/LINE
MANIFOLD ANEMOMETER VELOCITY	109.7	FT./MIN.
MANIFOLD THERMOCOUPLE TEMPERATURE	101.4	DEG. F
AVERAGE ROOF EXIT VELOCITY	133.0	FT./MIN.
AVERAGE ROOF EXIT TEMPERATURE	99.4	DEG. F
VOLUMETRIC FLOWRATE OUT ROOF	8494444	ACFM/LINE
VOLUME GAS SAMPLED	960.014	SCF
MOISTURE IN STACK GAS	0.629	%
VELOCITY OF STACK GAS (ACTUAL)	1287	FT./MIN.
VOLUMETRIC FLOWRATE IN DUCT	1530	SCFM
PERCENT ISOKINETIC - TRAIN TO DUCT	98.89	%
VOLUMETRIC FLOWRATE OUT ROOF	7891989	SCFM/LINE
PERCENT ISOKINETIC - MANIFOLD TO ROOF	106.54	%
SECONDARY POM CONCENTRATION	1.33E-04	GRAINS/SCF
SECONDARY POM EMISSION DUCT RATE	1.75E-03	LBS./HR.
SECONDARY POM EMISSION DUCT RATE	1.78E-04	LBS./TON
ROOF-SECONDARY POM EMISSION	9.026	LBS./HR./LINE
AVG. ALUMINUM PRODUCTION RATE	9.83	TON/HR./LINE
PROCESS DATA CORRECTION FACTOR	0.001905	
ROOF-SECONDARY POM EMISSION	0.918	LBS./TON
PRIMARY POM EMISSION	0.191	LBS./TON
TOTAL PRIMARY AND SECONDARY POM EMITTED	1.109	LBS./TON

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2/24/2021 03:29 PM

Stack Sample Results
Raw Data Averages
METHOD 14 LINE 2

Start Date: 2/23/2021 **Stop Date:** 2/24/2021 **Run #:** 1 POM

Traverse Point	Delta P (in. Water)	Delta H (in. Water)	Meter Temperature (in)	Meter Temperature (out)	Static Pressure (in. Water)	Stack Temperature (Deg. F)
1-1a	0.16	1.90	72	72	-0.55	75
1-1b	0.15	1.80	77	75		81
1-2a	0.15	1.75	77	75	-0.53	87
1-2b	0.14	1.65	77	75		90
1-3a	0.15	1.75	73	68	-0.56	91
1-3b	0.15	1.75	70	68		93
2-1a	0.13	1.50	71	70	-0.52	94
2-1b	0.13	1.50	76	70		90
2-2a	0.15	1.75	74	70	-0.54	88
2-2b	0.15	1.75	74	70		85
2-3a	0.15	1.75	75	75	-0.55	85
2-3b	0.15	1.77	76	76		85
3-1a	0.12	1.40	76	74	-0.51	84
3-1b	0.12	1.40	75	74		84
3-2a	0.13	1.55	77	73	-0.52	84
3-2b	0.14	1.70	77	74		84
3-3a	0.12	1.45	77	76	-0.53	83
3-3b	0.12	1.45	77	77		82
Averages	**0.373** (AVG. SQ.RT.)	**1.643**	**74.0**		**-0.53**	**85.8**

NORANDA ALUMINUM, INC.
METHOD 14 DATA
ROOF MONITOR

Run Start Date 2/23/21
Run End Date 2/24/21
Run # 1PoM
Run Start Time 09:05
Run End Time 08:20
Probe Tip SN 3248
Avg. Tip Diameter .3229
Delta H 1.91 2% Moisture (assumed)
Duct Area = 1.25 sq.ft.

Line: 1 (2) 3 East 3 West

Operators
Joe Schneider
Heath Corraway

Chemist

Digital meter used 2076
Initial L.C. @ 15.0 = .016
Final L.C. @ 5.0 = .006
Initial Pitot L.C. = Nil
Final Pitot L.C. = Nil

POINT #	SAMP. TIME Min.	METER VOLUME Cu. Ft.	DELTA P in. H_2O	DELTA H in. H_2O	METER TEMP F IN	METER TEMP F OUT	STATIC PRESS. in. H_2O	STACK TEMP. °F	IMP. TEMP. °F	HOT BOX TEMP. °F	PUMP VAC. in. Hg	SET PT.
1-1	155	217.400	.16	1.90	72	72	-.55	78	65	250	.2	11.98
			.15	1.80	77	75	~~-.54~~	81	63	255	.2	11.93
1-2	155	331.490	.15	1.75	77	75	-.53	87	64	255	.2	11.80
			.14	1.65	77	75		90	64	255	.1	11.74
1-3	155	442.080	.15	1.75	73	68	-.56	91	61	255	.2	11.60
			.15	1.75	70	68		93	62	255	.2	11.52
2-1	155	553.950	.13	1.50	71	70	-.52	94	64	255	.1	11.54
			.13	1.50	76	70		90	64	255	.1	11.68
2-2	155	658.090	.15	1.75	74	70	-.54	88	65	255	.2	11.70
		~~777.870~~	.15	1.75	74	70		85	65	255	.2	11.76
2-3	155	~~776.475~~	.15	1.75	75	75	-.55	85	66	255	.2	11.83
			.15	1.77	76	76		85	67	255	.1	11.85
3-1	155	884.250	.12	1.40	76	74	-.51	84	65	255	.1	11.85
			.12	1.40	75	74		84	64	255	.1	11.83
3-2	155	990.630	.13	1.55	77	73	-.52	84	64	255	.1	11.87
			.14	1.70	77	74		84	64	255	.1	11.86
3-3	155	93.220	.12	1.45	77	76	-.53	83	65	255	.1	11.90
			.12	1.45	77	77		82	66	255	.1	11.93
FINAL		196.510										
S/N		3622944					76	3-3	2A	2H		

Nomograph factor: 12.05

AP

Form: SS M14 Raw Data.xls 1/5/12

MAGNITUDE 7 METALS LLC
METHOD 14 RAW DATA

Line: 2 Start Date: 2-23-21 Run: 1PoM Filter: BP

PITOT TUBE — Circle to document visual inspection.

SN N9061

Visually inspected? Yes

PROBE TIP

SN 3248

DIAMETER MEASUREMENT (in.)

1. _____
2. _____
3. Avg a
4. _____
5. 322
6. _____
7. _____
8. _____

If previous calibration referenced, circle Yes to document visual inspection.

Out of round max. 0.004 in.

CAL. BY: _____

CALIPER: MITUTOYO S/N 7002015

NORANDA 0.5"

THICKNESS STD # 1 _____

SAMPLER OPERATION

PROBE HEAT SETTING	HEATER BOX SETTING
248 deg. F. +/- 25 deg. F.	For Method 13
Range: 223 - 273 deg. F.	165 deg. F. +/- 15 deg. F.
	Range: 150 - 180 deg. F.
	For Method 315
	248 deg. F. +/- 25 deg. F.
	Range: 223 - 273 deg. F.

BAROMETER READING 29.76 (in. Hg)

CORRECTION FACTOR -.14 (in. Hg)

For Method 13 only:

ORIGINAL GASEOUS M315

FLUORIDE SAMPLE VOLUME _____ (liter)

		INITIAL WEIGHT	FINAL WEIGHT 6265
IMPINGER #	+ 200 ml water	827.1	~~658.8~~ ~~[illegible]~~
IMPINGER #	+ 100 ml water	606.2	~~821.0~~ 685.5
IMPINGER #	+ EMPTY	500.7	~~615.1~~ 544.7
IMPINGER #	+ SILICA GEL	1489.0	~~1737.1~~ 1695.3
IMPINGER #	+ SILICA GEL		
IMPINGER #	+ SILICA GEL		

BALANCE: METTLER PJ6000 SNR K59603 WEIGHED BY: SS

2 Kg Class S-1 Calibration Wt. 1999.9 Balance check must be +/- 0.5 grams.

COMMENTS: _____

AP

Form: Impinger Report M14.xlsx 2/19/20

Magnitude 7 Metals LLC

GAS ANALYSIS REPORT

Location M14

Date 2/23/21

Run 1 PdM

Room C

Analyzed by JS

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	1350	0.0	20.5
2	1400	0.0	21.0
3	1405	0.0	21.0

Potline 2 Roof Exit Velocities and Temperatures

Manifold (C-66) Averages		Roof Averages	
WS (ft/min)	Temp (Deg. F)	WS (ft/min)	Temp (Deg. F)
109.7	101.4	133.0	99.4

	C-51			C-66			C-82		
Date/Time	WS (ft/min)	WD (Deg.)	Temp (Deg. F	WS (ft/min)	WD (Deg.)	Temp (Deg. F	WS (ft/min)	WD (Deg.)	Temp (Deg. F)
	_WS_AV	_WD_AV	_TEMP_	_WS_AV	_WD_AV	_TEMP_	_WS_AV	_WD_AV	_TEMP_
Averages:	228.7	294.7	103.5	109.7	146.9	101.4	60.8	166.6	93.3
2/23/21 9:05	100.5	166.4	89.4	111.1	153.6	88.4	74.1	150.9	82.8
2/23/21 9:20	108.9	174.1	91.2	120.9	153.6	88.6	67.7	140.9	83.2
2/23/21 9:35	104.5	178.4	91.8	106.5	153.5	89.4	64.8	144.0	84.6
2/23/21 9:50	120.7	180.7	93.8	109.9	148.4	91.1	60.4	137.0	85.9
2/23/21 10:05	106.2	182.2	93.9	103.4	153.6	93.4	55.1	148.1	87.6
2/23/21 10:20	121.2	183.1	96.6	114.5	148.7	93.5	57.7	142.5	87.6
2/23/21 10:35	96.6	186.4	98.2	106.8	150.3	94.2	59.1	143.5	89.2
2/23/21 10:50	98.0	186.1	99.1	109.2	145.4	94.1	65.1	147.0	90.3
2/23/21 11:05	80.6	179.7	101.0	118.2	145.1	95.7	66.3	143.7	90.3
2/23/21 11:20	69.0	162.9	103.3	98.6	151.5	98.8	78.2	149.9	92.0
2/23/21 11:35	74.0	355.6	104.0	101.6	151.7	100.6	79.3	160.6	93.5
2/23/21 11:50	269.1	359.9	105.7	104.8	148.4	101.6	66.0	155.1	94.5
2/23/21 12:05	290.2	359.9	106.7	99.6	147.4	101.1	77.1	160.1	93.6
2/23/21 12:20	271.6	359.9	107.5	97.4	145.1	101.7	67.3	146.0	94.8
2/23/21 12:35	267.7	359.9	106.2	95.1	146.6	103.0	46.9	151.5	96.3
2/23/21 12:50	245.9	359.9	108.4	106.3	139.4	101.7	60.4	149.2	95.7
2/23/21 13:05	256.9	359.9	108.3	95.0	138.5	102.6	55.1	149.4	96.1
2/23/21 13:20	259.2	359.9	110.7	93.6	143.6	104.9	47.3	149.6	97.1
2/23/21 13:35	284.0	359.9	109.3	98.2	141.9	103.3	44.0	130.4	97.1
2/23/21 13:50	288.2	359.9	109.3	96.5	144.2	105.7	45.3	137.8	98.6
2/23/21 14:05	268.5	359.9	109.3	90.9	146.7	105.9	45.1	141.4	99.9
2/23/21 14:20	270.4	359.9	107.6	106.0	149.7	107.5	50.4	146.9	101.6
2/23/21 14:35	283.7	359.9	107.7	103.4	143.9	108.6	62.1	167.7	103.7
2/23/21 14:50	279.6	359.9	110.1	103.1	144.0	107.6	59.8	166.0	102.6
2/23/21 15:05	261.0	359.9	112.1	123.3	151.0	108.7	51.1	179.2	102.6
2/23/21 15:20	279.7	359.9	110.5	97.4	146.7	107.3	41.2	191.3	100.3
2/23/21 15:35	286.3	359.9	110.4	112.4	146.8	108.2	42.4	161.5	100.3
2/23/21 15:50	268.6	359.9	111.4	129.0	156.0	109.4	42.2	183.6	100.3
2/23/21 16:05	261.9	359.9	112.8	118.6	150.8	108.6	44.0	160.4	100.3
2/23/21 16:20	269.2	359.9	109.2	124.6	157.1	109.5	68.8	154.4	104.2
2/23/21 16:35	282.8	359.9	109.1	111.4	156.1	109.0	55.0	154.7	102.4
2/23/21 16:50	261.0	359.9	109.1	116.8	154.5	108.4	64.9	172.7	103.5
2/23/21 17:05	257.0	359.9	108.4	104.4	152.6	108.0	58.9	165.0	103.4
2/23/21 17:20	255.6	359.9	108.2	106.9	146.5	107.9	58.2	186.4	103.3
2/23/21 17:35	284.3	359.9	108.6	113.1	149.7	107.8	51.5	160.3	102.4
2/23/21 17:50	274.8	359.9	107.9	109.5	148.7	106.8	46.9	194.1	101.7
2/23/21 18:05	277.5	359.9	105.8	108.4	147.1	105.7	36.8	180.4	100.0
2/23/21 18:20	269.6	359.9	105.1	112.7	157.7	104.2	33.2	189.5	96.3
2/23/21 18:35	287.0	359.9	105.0	120.5	157.5	104.0	36.6	198.0	96.4
2/23/21 18:50	289.6	359.9	105.0	120.7	158.0	103.8	35.5	203.2	97.4
2/23/21 19:05	286.1	359.9	104.9	105.6	151.2	103.6	48.5	197.8	95.0
2/23/21 19:20	282.9	359.9	104.8	110.8	153.4	102.9	63.4	200.0	93.3
2/23/21 19:35	286.5	359.9	104.7	107.3	153.2	102.8	56.9	190.2	94.4
2/23/21 19:50	291.3	359.9	103.6	116.7	163.3	102.8	53.7	191.3	94.4
2/23/21 20:05	267.2	359.9	104.1	105.6	157.6	102.2	50.9	188.0	94.9
2/23/21 20:20	271.2	359.9	104.9	106.8	159.6	102.7	49.6	186.3	94.9

	C-51			C-66			C-82		
Date/Time	WS (ft/min)	WD (Deg.)	Temp (Deg. F	WS (ft/min)	WD (Deg.)	Temp (Deg. F	WS (ft/min)	WD (Deg.)	Temp (Deg. F)
2/23/21 20:35	267.3	359.9	104.0	110.2	152.7	102.7	73.6	202.8	93.6
2/23/21 20:50	246.7	359.9	103.5	121.0	158.2	102.8	72.2	196.6	93.5
2/23/21 21:05	269.6	359.9	103.4	112.0	155.6	101.7	55.3	181.2	94.5
2/23/21 21:20	255.0	359.9	102.7	115.5	159.3	100.9	47.0	184.9	96.2
2/23/21 21:35	276.2	359.9	103.2	118.8	155.2	101.0	49.4	185.2	95.2
2/23/21 21:50	260.1	360.0	103.3	118.0	151.3	100.2	69.8	195.6	92.0
2/23/21 22:05	271.5	360.0	102.5	121.0	151.3	100.2	72.3	199.4	90.7
2/23/21 22:20	299.6	360.0	103.0	120.8	149.3	100.3	69.7	186.1	90.2
2/23/21 22:35	290.8	360.0	103.9	110.9	139.7	101.8	72.4	168.0	90.8
2/23/21 22:50	288.4	360.0	104.7	100.0	137.5	101.6	77.8	179.4	91.8
2/23/21 23:05	274.1	360.0	104.8	100.2	137.2	100.8	74.8	185.6	91.9
2/23/21 23:20	283.3	360.0	103.2	102.7	137.0	101.0	69.9	191.8	90.7
2/23/21 23:35	288.2	360.0	104.0	96.5	138.3	101.1	76.8	184.2	91.7
2/23/21 23:50	278.1	360.0	104.1	101.6	138.5	102.0	80.3	188.1	91.7
2/24/21 0:05	266.4	360.0	103.0	98.0	137.1	101.5	78.9	182.3	92.5
2/24/21 0:20	275.4	360.0	103.1	110.6	143.7	101.0	79.2	183.9	92.5
2/24/21 0:35	294.3	360.0	104.0	103.7	140.4	100.9	79.4	180.3	92.6
2/24/21 0:50	287.9	360.0	103.4	106.3	139.6	100.9	80.8	175.5	92.6
2/24/21 1:05	283.1	360.0	103.5	103.6	140.9	100.9	74.6	179.9	92.7
2/24/21 1:20	278.3	360.0	103.5	104.5	139.6	100.9	73.4	173.3	92.8
2/24/21 1:35	279.6	360.0	103.0	98.3	134.5	100.9	79.4	180.1	92.8
2/24/21 1:50	282.4	360.0	103.1	97.5	133.5	100.9	79.4	186.8	91.4
2/24/21 2:05	270.6	360.0	102.5	98.8	133.8	100.9	70.2	178.9	90.8
2/24/21 2:20	266.6	360.0	102.4	103.3	136.9	100.5	62.8	171.7	89.9
2/24/21 2:35	270.6	360.0	102.4	106.9	140.1	100.7	62.2	192.9	89.9
2/24/21 2:50	277.5	360.0	102.4	112.2	140.4	99.8	76.9	179.9	91.0
2/24/21 3:05	271.1	360.0	101.9	115.6	141.5	99.4	69.5	168.2	91.0
2/24/21 3:20	271.1	360.0	101.8	109.0	141.2	100.0	75.1	168.0	91.3
2/24/21 3:35	215.2	360.0	100.4	118.8	139.2	100.0	60.7	155.5	90.0
2/24/21 3:50	185.6	0.9	99.4	112.3	142.0	100.0	58.2	147.3	89.2
2/24/21 4:05	132.6	3.1	100.6	117.2	145.8	100.0	61.1	157.3	89.3
2/24/21 4:20	230.0	0.8	99.0	128.8	143.1	99.2	49.9	142.4	88.7
2/24/21 4:35	150.4	4.6	97.8	105.6	138.2	99.3	51.6	142.5	87.8
2/24/21 4:50	123.6	30.6	97.9	117.8	139.1	99.4	54.9	151.1	87.1
2/24/21 5:05	155.4	170.5	96.6	107.6	140.3	99.4	55.8	155.7	87.1
2/24/21 5:20	120.7	164.0	98.5	114.7	143.5	99.5	55.7	138.5	87.9
2/24/21 5:35	139.0	170.0	97.7	109.9	144.9	99.6	57.5	145.7	88.0
2/24/21 5:50	131.0	167.3	98.7	121.7	147.9	99.6	55.4	150.0	88.1
2/24/21 6:05	118.2	162.0	99.2	108.8	145.7	99.6	59.2	143.7	87.3
2/24/21 6:20	88.9	155.2	101.8	120.3	142.4	98.8	52.9	151.1	87.3
2/24/21 6:35	78.6	139.4	101.0	113.0	146.6	98.7	57.5	154.0	88.5
2/24/21 6:50	127.8	3.6	98.7	115.9	153.9	98.5	58.4	146.7	87.5
2/24/21 7:05	113.9	348.2	98.1	123.0	145.9	98.0	56.4	152.8	88.2
2/24/21 7:20	113.9	140.9	97.4	107.2	144.3	98.8	55.1	148.7	88.7
2/24/21 7:35	85.0	151.2	102.2	117.7	151.0	98.9	63.3	153.8	89.4
2/24/21 7:50	252.3	0.2	104.2	119.0	149.6	99.0	75.6	153.8	90.9
2/24/21 8:05	266.4	359.9	105.1	118.9	142.6	98.7	60.9	142.4	89.6
2/24/21 8:20	274.5	359.9	107.5	118.8	148.2	100.3	67.1	153.7	89.6