Notice of Compliance Status Report

Alloy Resources Corporation-

Secondary Aluminum Processing Unit

Alloy Resources Corporation

Muskegon, Michigan

November 2015

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List of Acronyms

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ABBREVIATION	DEFINITION
ACGIH	American Conference of Governmental Industrial Hygienists
CFR	Code of Federal Regulations
Cl_2	Chlorine
CMS	Continuous Monitoring Systems
CPMS	Continuous Parameter Monitoring Systems
CPT	Compliance Performance Test
D/F	Dioxin/Furan
HAP	Hazardous Air Pollutant
HCl	Hydrogen Chloride
MACT	Maximum Achievable Control Technology
MDEQ-AQD	Michigan Department of Environmental Quality – Air Quality Division
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOCS	Notification of Compliance Status Report
OM&M	Operation, Maintenance, and Monitoring
PET	Performance Evaluation Test
PM	Particulate Matter
PTI	Permit to Install
SA	Secondary Aluminum
SSM	Startup, Shutdown, & Malfunction
SSTP	Site Specific Test Plan
TEQ	Toxic Equivalency
USEPA	United States Environmental Protection Agency

Section 1
Introduction

1.1 General Information

Owner/Operator:	**Alloy Resources Corporation**
Street Address:	**2281 Port City Blvd.** **Muskegon, MI 49442**
Mailing Address:	**same as street address**
Website :	**http://www.alloyresourcescorp.com**
Plant Name:	**Alloy Resources Corporation (ARC)**
Plant Contact/Title:	**Dennis Flanagan, Plant Manager**
Plant Contact Phone Number :	**(231) 683-1832**
Plant Street Address	**2281 Port City Blvd.** **Muskegon, MI 49442**
Plant Mailing Address:	**same as street address**
Plant Fax Number:	**(231) 773-2038**
Plant 4-digit Standard Industrial Classification (SIC) Code(s):	**3341**
Plant UTM coordinates:	**565299 E-W** **4785117 N-S**
Plant Permit Number:	**PTI 340-07C (MDEQ-AQD)**

1.2 Compliance Information

This source is a (check one): ☐ major source ☒ area source

1.3 Report Summary

On March 23, 2000, the United States Environmental Protection Agency (USEPA) promulgated the Secondary Aluminum National Emission Standards for Hazardous Air Pollutants (SA NESHAP) in 40 CFR § 63 Subpart RRR. The SA NESHAP compliance date for existing sources was March 24, 2003. This document covers the ARC operations that are regulated under the NESHAP for secondary aluminum production.

ARC is an aluminum processing and casting facility that operates a Secondary Aluminum Processing Unit (SAPU) that includes two reverberatory melting furnaces EUALREVERB and

EUREVERB50. The SAPU at ARC is defined as FGFURNACES in PTI 340-07C. An additional zinc pot furnace (EUZINC30) is permitted at the facility under PTI 340-07C, but the zinc pot furnace was not operating during this most recent compliance testing. FGFURNACES processes both clean and unclean charge aluminum scrap into molten aluminum and rolling ingots for further processing. This operation meets the definition of a secondary aluminum production facility found in 40 CFR 63.1503. Therefore, FGFURNACES is subject to the SA NESHAP, contained in 40 CFR § 63. Subpart RRR.

On August 25, 2015, MDEQ-AQD approved the SSTP for this CPT (see attached approval letter in Appendix A). Performance testing was conducted in accordance with 40 CFR 63.1511(b) for FGFURNACES from September 23, 2015 through September 24, 2015. This testing was conducted to demonstrate compliance with emissions standards listed for Group 1 furnaces at major or area sources listed in 40 CFR 64.1505(i). TRC Environmental Corporation (TRC) conducted the stack testing.

This NOCS has been prepared in accordance with the requirements of 40 CFR § 63.1515(b) and 40 CFR § 63.9(h). It summarizes the methods used to determine compliance, the results of the compliance testing event, the quantity of hazardous air pollutants (HAPs) emitted, and the methods intended for use in determining continued compliance at ARC.

The production data during the CPT for FGFURNACES is contained in Table 4-1. Tables 4-2 through 4-3 summarize the analytical results from the CPT event for FGFURNACES. Table 4-1 summarizes the usage data for chlorine flux during the CPT conducted on FGFURNACES. Tables 5-1 and 5-2 summarize the furnace parametric operating parameters monitored during the CPT. Table 6-1 presents the ongoing compliance operating parametric values and ranges for the SAPU.

A listing of the information required for a complete NOCS along with the regulatory citation and the location of the information in this document is presented below.

Table 1-1
NOCS Report Map

Regulatory Requirement	Citation – 40 CFR § 63.	Location in Report	Detailed Data in Appendices
Site Specific Test Plan (SSTP)	1515(b)(2)	Section 3	Appendix A
Performance Evaluation Test (PET) Results	1515(b)(2)	Section 2	Appendix B
Performance Stack Test Report	1515(b)(1)	Sections 3 and 4 (Summary of Results)	Appendix C (Full Test Report)

Table 1-1
NOCS Report Map

Regulatory Requirement	Citation – 40 CFR § 63.	Location in Report	Detailed Data in Appendices
Performance Test Charge Weight/Production Data	1515(b)(1)	Section 5	Appendix D
Performance Test Parametric Monitoring Data	1515(b)(4)	Section 5	Appendix D
Operations, Monitoring and Maintenance (OM&M) Plan	1515(b)(9)	Section 6	Appendix E
Emission Unit Labels	1515(b)(1)	Section 6	Appendix F
ACGIH Capture/Collection Conformance Documentation	1515(b)(1)	Section 2	Appendix G
Bag Leak Detection Analysis	1515(b)(1)	Section 5	Appendix H
Startup, Shutdown and Malfunction (SSM) Plan [1]	1515(b)(1)	Section 6	Appendix E

Notes: NA- Not Applicable.
1 The SSM Plan has been integrated into the OM&M Plan.

Section 2
Process Operations During CPT

The SAPU at ARC consisting of two reverberatory furnaces EUALREVERB and EUREVERB50 are subject to the National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production (SA NESHAP), contained in 40 CFR Part 63 Subpart RRR:

The production process tested during the CPT were operated as described below. The operation of the process deviated where noted from the SSTP, which is included in Appendix A of this NOCS.

The following sections provide a description of the process and how it was operated during the CPT.

2.1 FGFURNACES Operations

ARC operates a SAPU including two controlled furnaces (EUALREVERB and EUREVERB50) exhausting through the lime injected baghouse identified in PTI 340-07C. The ARC SAPU, defined as FGFURNACES in PTI 304-07C, receives both clean an unclean scrap including virgin aluminum and reclaimed scrap as well as internally generated run-around scrap and alloying agents.

Fluxing with chlorine gas removes metal oxides by floating the oxides to the surface of the molten bath of EUALREVERB. ARC monitors the chlorine gas flow rate and the length of time (beginning and ending of fluxing cycle) flux is being added to the furnace during the operating cycle (e.g., cast)). Flux time may be increased for drain and-cleans or fill-ups, or due to high sodium content in the charge which are part of normal processing, or due to process upsets.

FGFURNACES went through a complete production cycle including charging, fluxing and tapping (for a minimum of three hours) during the CPT. FGFURNACES was operated at the highest production level achievable with the charge materials representative of the range of materials processed by the furnace on that day. These operating rates were achieved only to demonstrate compliance with the NESHAP limits, and are not representative of the equipment maximum operational capacity over an extended period.

The capture/collection systems (furnace hooding) on EUALREVERB was documented to be in operating accordance with the American Conference of Governmental Industrial Hygienists (ACGIH) guidance provided in Chapters 3 and 5 of the "Industrial Ventilation: A Manual of Recommended Practice". Supporting calculations documenting theoretical flow

requirements and actual values measured during an evaluation of the hood system conducted by ARC are provided in Appendix G. Comparable baghouse data collected during the CPT is presented in Appendix D. The captured emissions are vented through a closed system to the baghouse control devices. Dilution air is added to control temperature at the inlet of the fabric filters, when required.

Section 3
Testing Program Description

The testing program at ARC was designed to meet the requirements established under 40 CFR 63 Subpart RRR (SA NESHAP) for Group 1 furnaces with add-on air pollution control devices. The SA NESHAP requires the following:

- A SAPU processing scrap other than clean charge materials with emissions controlled by a lime injected fabric filter must be tested for PM and Dioxin Furan (D/F) at the outlet of the control device and HCl at either the outlet or both the outlet and inlet.

3.1 Test Program Summary

Testing of FGFURNACES was completed using the methods and techniques detailed in the approved SSTP (see Appendix A). Testing was conducted in two main phases. D/F and HCl emissions were measured during one set of three tests encompassing three, three hour tests periods over two days, September 23 – 24, 2015. PM testing was completed during three one hour tests conducted on September 24, 2015.

Emission testing was performed at the exhaust stack for the combined lime injected baghouse that controls FGFURNACES at ARC. Sampling was competed from non-permanent scaffolding erected by ARC for the purposes of this testing. The exhaust stack is 65 inches in diameter with sampling ports located at 90 degree angles.

Portions of the compliance testing were observed by Eric Grinstern and Jeremy Howe of the MDEQ-AQD.

USEPA Methods 1, 2, and 3 were used to gather information related to sample point determination, volume flow, exhaust gas composition, and exhaust gas moisture. Testing was conducted to determine the PM (Methods 5 and 202) and HCl (Method 26A) emissions, using a combined sample train, from EUALREVERB. Copies of the procedures and results for the USEPA Methods used during the compliance testing event are included in the Source Emission Test Report (Appendix C).

During the compliance testing events, charge data (charge weights and scrap classification) was monitored to ensure the representative nature of the feed/charge rates to FGFURNACES. Additionally, production data was collected to establish production rates for the furnace. The ARC production data was used to calculate the pollutant emission rates per ton of aluminum produced to determine compliance with the SA NESHAP requirements.

In addition, the following operational parameters were monitored and recorded for FGFURNACES:

- The continuous lime feed rate
- The furnace baghouse system inlet temperatures
- The signal output of the bag leak detectors
- The gaseous reactive flux addition rates
- Total gaseous flux addition

Section 4 presents the analytical and calculated emissions results. Section 5 presents the parametric monitoring results. This information was used to establish compliant operating parameter values and ranges to demonstrate continued compliance with the applicable standards presented in Section 6.

Individual testing events are summarized below:

3.1.1 D/F and HCl Testing Summary

As shown in the Tables 4-3 and 4-4 below, results of the D/F and HCl testing were inconsistent. The results of test runs 1 and 3 were consistently below their applicable emission limits and also reflected normal operating conditions. Test run number 2 resulted in D/F emissions significantly greater than the applicable emission limits on a pound D/F per ton basis. Additionally, the HCl results from test run number 2 were significantly higher than those measured during test runs 1 and 3.

Elevated emission measurements during test run number 2 were caused by the unscheduled cleaning of the hearth on EUALREVERB during the test run. Cleaning of the hearth in general causes increased exhaust temperatures and the generation of additional emissions during the cleaning period that may skew data from tests conducted during normal furnace operations (represented by tests 1&3). Cleaning the hearth in this manner during a period of high production does not reflect normal operation of FGFURNACES at ARC. Operating in the fashion also does not reflect the proposed operation parameters in the approved SSTP.

3.1.2 PM Testing Summary

Table 4-2 summarizes measured PM emission rates from FGFURNACES during the three test runs on September 24, 2015. While emissions measured during tests 5 and 6 demonstrated compliance with all applicable standards, emissions measured in test 4 produced results greater than the applicable permit limits.

Elevated emission measurements in test 1 were related to the baghouse cleaning cycle that occurred immediately prior to the start of test run 1. While cleaning of this type reflects normal operation, ARC operating procedures call for a period prior to charging of the furnace to allow the filter cake on the baghouse to build up. That period was not observed prior to test run 1. Therefore, test run 1 was conducted during a period that did not reflect normal operation and was not consistent with the SSTP.

The following methodology was used to calculate the NESHAP compliance status of the subject emission units.

3.1.3 FGFURNACES – Group 1 Furnace Compliance Evaluation

For the CPT on FGFURNACES, ARC demonstrated compliance by testing the exhaust stack of the control device while the associated units operated under the highest load or capacity reasonably expected to occur on a short-term basis.

Aluminum production information was collected during the CPT. This set of data was also used to calculate the pollutant emission rates per ton of aluminum production to determine compliance with the SA NESHAP requirements.

Testing on FGFURNACES was conducted over two days in order to facilitate data collection for all required contaminants listed in the SA NESHAP.

Section 4
Test Results

This section has been prepared to present the results of the CPT that was conducted at ARC from September 23 - 24, 2015. No deviations from the methods of testing outlined in the SSTP and the final testing notifications were observed.

4.1 FGFURNACES Results Summary

The SA NESHAP and PTI 340-07C emission limitations that apply to the controlled SAPU (FGFURNACES) at ARC are for PM, HCl and D/F. As outlined earlier in this report emissions were collected from the exhaust stack from the lime injected baghouse at ARC.

The production and reactive gaseous flux data for FGFURNACES is contained in Table 4-1. The analytical results from the testing event are presented in Tables 4-2 and 4-3. Due to the testing conditions for runs 2 and 4 outlined in Section 3 above, the results of test runs 2 and 4 are presented but not included in the average results shown. The data compared to test results only include those runs that reflect normal operation as described above. A complete copy of the Source Emission Evaluation Report and a summary of the production data and emissions calculations are included in Appendix C and Appendix D of this document.

Table 4-1
Summary Results: FGFURNACES Production and Gaseous Cl_2 Flux Conditions

Run Number [1]	Date	Production (tons/hr)	Production (Tons/Test)	Gaseous Cl_2 Addition (lb/Test)
1	9/23/2015	5.67	17.00	244
2	9/23/2015	5.85	17.54	270
3	9/24/2015	6.06	18.17	309
4	9/24/2015	6.14	6.14	114
5	9/24/2015	6.06	6.06	97
6	9/24/2015	6.38	6.38	95
Average		**6.02**	**11.88**	**188**

1 D/F emissions testing was conducted concurrently during runs 1, 2 and 3, HCl testing occurred concurrently to portions of the D/F tests. Particulate emissions testing was conducted on runs 4, 5 and 6 only.

2 Runs 4, 5, and 6 were one hour in length in keeping with the methods used to determine PM emissions.

As shown in Table 4-2, the PM emissions from FGFURNACES measured during the two tests that reflected normal operation were well below the emissions limits required in PTI 340-07C and the SA NESHAP for Group 1 furnaces. PTI 340-07C lists particulate limits for

EUALREVERB as an individual furnace. The data listed in Table 4-2 is based on emissions from FGFURNACES and throughput for EUALREVERB only. Emission limits for FGFURNACES include the full production rate from the SAPU. All tested results presented are filterable and condensable emission rates combined.

Run 4 listed below is not included in the average emission results as the condition measured did not reflect normal operation as described in Section 3 above.

Table 4-2
FGFURNACES (SAPU) Summary Results: PM Emissions

Emission Unit	Pollutant	Units	Run 4[2]	Run 5	Run 6	Average	Limit
EUALREVERB	PM	gr/dscf	0.0129	0.0029	0.0033	**0.0031**	**0.01**
EUALREVERB	PM10	lb/ton	1.77	0.33	0.29	**0.31**	**0.5**
EUALREVERB	PM2.5	lb/ton	1.77	0.33	0.29	**0.31**	**0.5**
FGFURNACES	PM	gr/dscf	0.0129	0.0029	0.0033	**0.0031**	**0.01**
FGFURNACES	PM10	lb/hr	7.99	1.68	1.82	**1.75**	**3.3**
FGFURNACES	PM2.5	lb/hr	7.99	1.68	1.82	**1.75**	**3.3**

1 Runs 4-6 are labeled 1-3 on September 24 on page 11 of 142 in the attached test report.
2 Run 4 is not included in the average calculations because the measured period did not reflect normal operation.

As shown in Table 4-3, the HCl emissions from the SAPU are below the NESHAP emissions limit of 0.34 pounds of HCl per ton of aluminum (lb/ton charged) presented in PTI 340-07C.

As outlined in Section 3, test run number 2 did not reflect normal operation due to an unexpected but necessary maintenance event. Since the test run does not reflect normal operation of the SAPU, the measured results of the test run have not been included in calculation of average emissions presented here. Please note that an average emission rate including test run 2 would also result in an average emission rate that is less than the presented HCl limit.

Table 4-3
FGFURNACES (SAPU) Summary Results: HCl Emissions

Emission Unit	Units	Run 1	Run 2[2]	Run 3		Average	NESHAP Limit
EUALREVERB	lb/ton	0.25	0.67	0.01	--	**0.13**	**0.34**

1 NESHAP Standard is 0.40 lb/ton. Limit presented is from MDEQ-AQD permit PTI 340-07C representing 85% of the NESHAP limit
2 Run 2 is not included in the average calculation because the measured period did not reflect normal operation

Additionally, an HF limit of 0.34 pounds of HF per ton of aluminum (lb/ton charged) is listed in PTI 340-07C. Results of emission testing of FGFURNACES showed a HF emission rate below detectable limits, or less than 0.0 lb/ton.

Table 4-4 outlines the D/F emissions from FGFURNACES. The presented average demonstrates compliance with both the SA NESHAP limit on lb/ton of D/F emissions and the limit listed in PTI 340-07C on lb of D/F emissions per hour.

As outlined for the HCl results above, test run 2 outlined below was conducted during an operating period that did not reflect normal operation. Therefore, measurements collected during test run 2 have not been included in the average emission rate presented.

Table 4-4
EUALREVERB (Group 1 Furnace) Summary Results: Dioxin/Furan Emissions

Emission Unit	Units	Run 1	Run 2[2]	Run 3		Average	NESHAP Limit
EUALREVERB	lb/ton	2.17E-8	5.83E-8	1.43E-8	--	**1.80×10^{-8}**	**3.0×10^{-8}**
FGFURNACES	lb/hr	1.23E-7	3.41E-7	8.68E-8	--	**1.05×10^{-7}**	**3.67×10^{-7}**

1 NESHAP standard presented, limit in PTI 340-07C listed as 6.0E-8 lb/ton for EUALREVERB and 3.6E-7 lb/hr for FGFURNACES

2 Run 2 is not included in the average calculation because the measured period did not reflect normal operation

Please note that a three test average (3.1E-08 lb D/F per ton) that includes the non-normal condition represents an emission rate just 4% greater than the D/F limit. The two test average presented above in well below the stated limit. Further, activated carbon injection is a proven D/F adsorbent at high temperatures. ARC has installed such a system and plans to initiate carbon injection at 195 °F or during cleaning as a preventative action. Additional information on carbon injection can be found in Section 6 which outlines ARC's plans for ongoing compliance.

Section 5
Parametric Monitoring Results

The parameters that were monitored during the CPT are outlined and described below. The tables presented in this section are a summary of the process and emission control parameters within which ARC operated during the compliance testing applicable to the SA NESHAP. Appendix D contains the parametric data recorded during the CPT.

Table 5-1 below outlines the parameters required to be monitored under 40 CFR § 63.1510 and the method employed at ARC to monitor each parameter. The parametric operating parameters were recorded during the full cycles that were tested. These values were then converted to the required units for inclusion in the report.

Table 5-1
EUALREVERB Monitored Data

Parameter	Operating Cycle or Time Period	Monitoring Method	Monitoring Unit
Aluminum Charged	Each Batch	Aluminum Production Measurement Scale	Pounds per Charge
Chlorine Reactive Flux Injection	Hourly Flow Rate During Operation	Chlorine Demag System	Pounds per Hour
Baghouse Inlet Temperature	Test Run Average	Temperature Probe	Degrees Fahrenheit
Lime Feed Rate	Test Run Average	Lime Injector Setting	Pounds per Hour
Carbon Feed Rate	Test Run Average	Carbon Injector Setting	Pounds per Hour

5.1 FGFURNACES Parametric Monitoring Parameters

Table 5-2 shows the results of parametric monitoring for each test run monitored during the CPT for FGFURNACES at ARC. For the tested scenario, the furnace parameters were recorded during the full batch cycles that were tested. These values were then converted to the required units for inclusion in the report.

Table 5-2
Operating Data Summary

Test Runs	Aluminum Production (tons/batch)	Cl_2 Injection Rate (lb/hr)	Total Reactive Flux Injection Rate (lb Cl_2/ton Al) [1]	Average Baghouse Inlet Temperature (°F)	Average Lime Feed Rate (lb/hr)	Average Lime Feed Rate Setting (lb/hr)
Run 1	16.995	81.33	14.36	196	46.67	40
Run 2	17.535	90.00	15.40	198	48.67	40
Run 3	18.17	103.00	17.01	198	44.67	40
Run 4	6.14	114.00	18.57	200	37.60	40
Run 5	6.055	97.00	16.02	208	40.00	40
Run 6	6.38	95.00	14.89	207	37.00	40
Average	**11.88**	**96.72**	**16.02**	**201.17**	**42.43**	**40**

5.2 Bag Leak Detector Monitoring Results

The bag leak detection system is not a continuous mass monitoring device. The data generated can be used as an indication that a malfunction, such as a fabric filter bag failure, has occurred. Continuous compliance is demonstrated by monitoring various operating parameters, including the use of a CPMS, such as a bag leak detection device. The stack sample analyses of the collected samples for the emissions of D/F, HCl, and PM shows that the detection device provides an indication of normal operation that is well within the allowable emission limits.

The charts presented as part of Appendix H (Bag Leak Detection Data) provide summaries of the bag leak detection data that was measured during the emission sampling events. Based on this data, the baselines of the bag leak detection devices are within the standard allowable emission limits, and the bag leak detectors proved to be reliable indicators that the systems were operating properly.

Parametric bag leak detector limits for monitoring ongoing compliance of the lime injected baghouse are presented in Appendix H.

Section 6
Plan for Ongoing Compliance Demonstration

Table 6-1 presents the compliant operating parameters ARC intends to operate within to maintain compliance with the SA NESHAP. The values and ranges represent those values established during the September 2015 CPT which demonstrated compliance with the regulatory requirements. As such, operations within these values and ranges will demonstrate continued compliance.

Table 6-1
NESHAP Compliant Operating Parametric Monitoring

EMISSION UNIT	PARAMETER	MONITORING VALUE/RANGE
FGFURNACES	Bag Leak Detector	Initiate corrective action within one hour of alarm and complete in accordance with OM&M Plan; operate such that alarm does not sound more than 5% of operating time in a 6-month period.
	Baghouse Inlet Temperature	3 hour average ≤ 222 °F – Average from stack text +25 °F
	Baghouse Pressure Drop	4-9 inches H2O
	Lime Injection Rate[1]	≥ 40 lbs/hr – setting during stack test
	Carbon Injection Rate	5 lbs/hr – proposed voluntary setting when 3 hour average temperature is greater than 195 °F in last three days.
	Chlorine Flux Injection	≤ 90 lb / hr – per stack test or ≤ 2,160 lb / day – per stack test
	Reactive Flux Addition	≤ 900 lbs/hr or 21,600 lbs/day - per stack test

Notes: This table applies only to requirements of the SA NESHAP.
[1] Rate of 40 lb/hr represents the lime injection setting during all test runs.

This information has been incorporated into the facility's OM&M Plan, and ARC will monitor these parameters to allow the facility to report continued compliance with the SA NESHAP requirements.

Appendix F provides emission unit label formats.

Two of the six total test periods observed during the CPT were impacted by operating conditions outside of the norm for the SAPU at ARC. The test results presented in Section 5

demonstrate that periods of normal operation of FGFURNACES results in emissions well below applicable emission limits. ARC has identified operational parameters in Table 6-1 that will ensure operation of FGFURNACES takes place under normal conditions that meet the requirements of the SA NESHAP, PTI 340-07C and any future permit issued by MDEQ-AQD. An explanation of key operational parameters follows.

6.1 Carbon Injection

In general, D/F emissions from secondary aluminum operations have been observed to increase with increases in operating temperature. During the CPT, an unscheduled but necessary cleaning operation was conducted in EUALREVERB that resulted in increased baghouse inlet temperature. Performing the cleaning operation during the charging process as occurred during the test period does not reflect normal operation of FGFURNACES. As shown in the Table 4-4 above, the cleaning operation and increased temperature correlated with an increased D/F emission rate measured in the exhaust gas.

In order to reduce D/F emission rates from processes that emit these compounds facilities must either utilize an add-on control technology or operate at reduced temperatures. Recently ARC installed a carbon injection system as a Supplemental Environmental Project coordinated with MDEQ-AQD. This carbon injection system is anticipated to reduce D/F emissions based on the capability of carbon to adsorb D/F emissions in the exhaust stream.

ARC has identified carbon injection as both an effective and cost efficient solution for reduction of D/F emissions in the exhaust stream for FGFURNACES. Based on data from comparable sources, ARC expects reductions in D/F emission rates of greater than 50% for stack temperatures at 195 °F or above. Even a modest reduction of D/F emissions from test run 2 would have resulted in average emissions across all three test runs to be less than the relevant lb D/F per hour standard.

Therefore, while the carbon injection system was not operated during this CPT, ARC is proposing use of the installed carbon injection system when 3 hour average temperatures reach 195 °F. The proposed operation rate of 5 lb carbon per hour is based on carbon reduction observed from other, comparable facilities. Operation of the injection system would continue until the 3 hour average exhaust temperature is less than 195 °F for at least 48 operating hours. ARC understands that operation of the carbon injection system will be required under these conditions once the OM&M plan is approved by MDEQ-AQD.

6.2 Baghouse Pressure Drop

Test run 4 on September 24, 2015 resulted in condensable particulate emissions significantly greater than those measured during test runs 2 or 3. Additionally, pressure drop across the lime injected baghouse during these test runs varied significantly. Table 6-2 below outlines condensable particulate and filterable particulate emissions for the three tests runs along with the pressure drop range observed during the run.

Table 6-2
FGFURNACES Detailed Results: Particulate Emissions

Analyte	Units	Run 4	Run 5	Run 6
Filterable Particulate	lb/hr	0.63	0.92	0.55
Condensable Particulate	lb/hr	7.36	0.75	1.26
Pressure Drop	in. H_2O	3.5-5.2	5.6-6.5	6.6-7.2

1 Runs 4-6 are labeled 1-3 on September 24 on page 11 of 142 in the attached test report.

Pressure drop across the lime injected baghouse at ARC can be directly correlated to the thickness of filter cake in place on the bags. This filter cake is vital to the control of condensable particulate emissions. The practice of using filter cake to control condensable particulate emissions reflects the industry standard and, as demonstrated by tests runs 5 and 6, the method is effective. The presence of filter cake on the baghouse bags can be impacted by baghouse maintenance and scheduled cleaning cycles of baghouse bags. At ARC cleaning is conducted mechanically once per shift while the process is not operating.

Prior to test run 4 on September 24, 2015 ARC conducted a cleaning cycle on the lime injected baghouse. This cleaning operation reflects a normal maintenance activity at ARC and it is necessary to maintain the proper operation of the baghouse. However, prior to start-up of FGFURNACES ARC operating procedures call for a period of operation in which the lime injection equipment operates without charging the furnace in order to apply the appropriate filter cake to the bags. This period of operation was not conducted on the test day resulting in less than ideal filter cake on the bags and increased condensable particulate emissions during test run 4. It is possible that during the short period that operation took place while the baghouse pressure drop was between 3.5 and 4 inches of H2O the filter cake was not built up enough to effectively capture condensable emissions generated in FGFURNACES.

Based on the information provided above, ARC has included in the attached OM&M and Table 6-1 above, a proposed operating range of 4-9 inches of H_2O for pressure drop across the lime injected baghouse. The range is based on both the manufacturers proposed normal range of

operation of the baghouse (2-9 in. H_2O) and the measured particulate emissions outlined above. Consistent with existing OM&M procedures, pressure drop will be monitored continuously and operation of FGFURNACES while the pressure drop is outside of the proposed range will be a deviation. Deviations will be recorded and corrected as per the approved OM&M.