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November 13, 2019

Ms. Sydney Bruestle
Environmental Quality Analyst
EGLE Air Quality Division
1504 West Washington Street
Marquette, MI 49855

RE: Violation Notice Response for HCl Repeat Performance Testing on No. 11 Boiler at Verso Escanaba LLC – Plant ID# A0884 –NESHAP Subpart DDDDD

Dear Sydney:

As discussed, this letter is in response to the Violation Notice submitted to Verso Escanaba (VE) from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) dated October 25, 2019. VE completed Repeat Performance Testing (RPT) on the No. 11 Boiler (EU11B68) on August 21, 2019. This testing was to demonstrate compliance with the requirements of the applicable standards for 40 CFR 63 subpart DDDDD. As shown in Table 1, Hydrogen Chloride (HCl) emissions were above the emission standards. All other tested parameters were well below the emission standard.

Table 1 - HCl Summary - BMACT (63 DDDDD) Emission Standards

Source	Pollutant	Average Measured	Allowable	Units	% of Allowable
No 11 Power Boiler	HCl	2.4E-02	2.2E-02	lb / MMBtu	**108%**

Fuel pollutant loadings for the 2019 RPT were based off previous tests completed in 2015 and 2016. During the 2015 and 2016 testing the HCl removal efficiency was approximately 60%. VE used the 60% removal efficiency to calculate the fuel pollutant loading into the boiler for the 2019 RPT. Summaries of the 2015, 2016, and 2019 stack testing are in Attachment 1.

The average fuel HCl loading for the 2019 compliance RPT was 3.62E02 lbs HCl/MMBtu. Using the removal efficiency of 60% determined during the 2015 and 2016 testing the expected HCl emissions were 1.45E-02 lb/MMBtu. This is below 75% of the monthly limit of 2.2E-02 lb/MMBtu and would have allowed VE to continue to test every three years.

Because HCl emissions are variable and cannot be viewed live via Method 26A, VE discussed how to ensure compliance with Tom Gasloli of EGLE. Tom suggested using Fourier

Transform Infrared Spectroscopy (FTIR). VE rented an FTIR instrument for $15,000 and completed three engineering runs prior to the official RPT to confirm HCl compliance would be met. These tests were well below the limit as seen at the bottom of Attachment 2, so VE authorized the stack testers to start the compliance runs. The FTIR requires liquid nitrogen (N) to operate and unfortunately the stack testers ran out prior to completing the first compliance run; therefore, VE was unaware the HCl concentrations began to increase.

In addition, after reviewing the oxygen (O_2) values during the 2019 RPT and comparing them to previous stack tests, the O_2 was abnormally high. VE was not aware how significant a role O_2 percentage has when calculating HCl emissions. The Method 19 calculation is shown in Attachment 2. If the average O_2 results (8%) from previous tests were used, the HCl emission rate would have been below the limit of 2.2E-02 lb/MMBtu as highlighted at the bottom of Attachment 3.

No. 11 Boiler is the largest power boiler at VE. No. 11 Boiler can burn a variety of fuels including natural gas, woodwaste, coal, tire derived fuel (TDF), and wastewater treatment plant residuals. This fuel flexibility is critical to minimizing costs in the very competitive global pulp and paper market. In general, coal is the fuel that drives HCl loadings to No. 11 Boiler. Because fuel prices change relatively frequently, it is important for VE to maintain the flexibility to burn as much low-cost fuel as possible. At times this includes coal.

Subpart DDDDD regulations make it very difficult to maximize fuel flexibility, especially as it pertains to coal and HCl. This is because you must be less than the emission limit of 2.2E-02 lbs/MMBtu HCl to test annually or below 1.65E-02 lbs/MMBtu (75% of the limit) to test every three years. As explained earlier, it was VE's goal to continue to test every three years. There is no credit in the rule for being significantly under the limit, in fact there is a penalty. For example, in the 2016 RPT VE fed 3.16E-02 lbs/MMBtu to No. 11 Boiler and the stack emissions were 1.2E-02 lbs/MMBtu. This was 55% of the limit and a removal efficiency of 62%. The feed limit was therefore set at 3.16E-02 lbs/MMBtu per the rules. If a hypothetical Facility X fed 2.5E-02 lbs HCl/MMBtu and the emissions were 2.2E-**04** lbs HCl/MMBtu, the feed limit for Facility X would be 2.5E-02 lbs/MMBtu. This is considerably less than VE's feed limit despite the fact that Facility X tested at only 1% of the limit and had a removal efficiency of 99%. VE believes the rule-makers understood this nuance and understood that many facilities would need to push RPT's to maintain maximum fuel flexibility. For this reason they allowed failed performance tests to be deviations rather than violations in the rules as demonstrated below.

VE does not believe this RPT is a violation but rather a deviation because under 40 CFR 63.7515(c), it states that:

> "**if a performance test shows emissions exceeded the emission limit** or 75 percent of the emission limit (as specified in Tables 1 and 2 or 11 through 13 to the subpart) for a pollutant, **you must conduct annual performance tests for that pollutant until all performance tests over a consecutive 2-year period meet the required level** (at or below 75 percent of the emission limit, as specified in Tables 1 and 2 or 11 through 13 to the subpart)."

The rule does not state that exceeding the emission limit during a RPT is a violation of the rule, but it does state the following under the definition of Deviation found under 40 CFR 63.7575:

> ***Deviation.*** (1) ***Deviation*** **means any instance in which an affected source subject to this subpart**, or an owner or operator of such a source:

(i) **Fails to meet any applicable requirement or obligation established by this subpart including, but not limited to, any emission limit,** operating limit, or work practice standard; or

(2) A deviation is not always a violation.

Per the bolded and highlighted wording above, VE does not believe a Violation Notice is warranted for this RPT.

Another reason why VE believes this RPT should be considered a deviation and not a violation is because the goal of the rule is to keep HCl emissions from the stack to less than 2.2E-02 lbs/MMBtu on a monthly average. The timeframe of this requirement is specified in the rules highlighted below:

§63.7540 How do I demonstrate continuous compliance with the emission limitations, fuel specifications and work practice standards?

(a) (2) As specified in §63.7555(d), you must keep records of the type and amount of all fuels burned in each boiler or process heater during the reporting period to demonstrate that all fuel types and mixtures of fuels burned would result in either of the following:

(ii) Equal to or lower fuel input of chlorine, mercury, and TSM than the maximum values calculated during the last performance test, if you demonstrate compliance through performance testing.

§63.7555 What records must I keep?

(d) (1) You must keep records of **monthly** fuel use by each boiler or process heater, including the type(s) of fuel and amount(s) used.

Although the HCl stack emissions were higher than 2.2E-02 lbs/MMBtu for two compliance test runs totaling 2 hours and 51 minutes on August 21, 2019; the total HCl fuel loading rates to No. 11 Boiler were well below the actual monthly limit. As shown in Table 2 below, the actual monthly loadings for August, September, and October are well below the limit established during the last RPT and are also below the allowable emission rate of 2.2E-02 lbs/MMBtu. Because all stack tests demonstrate HCl removal and fuel feed rates are below the emission limit, there is no way VE can be above the limit.

Table 2 - Monthly Fuel Pollutant Loading Vs. the Limits

Month	Monthly Actual HCl Loading lbs/MMBtu	HCl Loading Limit Established during Last RPT lbs/MMBtu	HCl Stack Emission Limit Lb/MMBtu
August	**8.00E-03**	3.16E-02	2.2E-02
September	**9.07E-03**	3.16E-02	2.2E-02
October	**8.64E-03**	3.16E-02	2.2E-02

In summary, this deviation is not on-going as it occurred for approximately 3 hours on 8/21/19. It occurred because VE was performing a RPT for HCl while attempting to maintain fuel flexibility which is critical to this facility.

VE will do the following to ensure compliance:

- Conduct an HCl stack test on No. 11 Boiler by June 30, 2020. This is within the 13 month requirement in the rules and will avoid testing in inclement weather which is unsafe and causes issues with Method 26A.
- Monitor O2 levels more closely during the next HCl stack test to ensure they are at normal operating levels.
- Ensure there is plenty of liquid N available if an FTIR is used during the HCl stack testing.
- Report this deviation in the Title V Second Half Semi-annual Certification report, the Title V 2019 Annual Certification report, and the 2019 Second half Semi-annual Compliance report under 40 CFR 63 Subpart DDDDD.
- Maintain monthly fuel records and limit HCl fuel loading to No. 11 Boiler to 2.2E-02 lbs/MMBtu unless EGLE allows VE to increase this amount to 3.16E-02 lbs/MMBtu per the request below or VE completes a successful HCl compliance test.

VE is requesting EGLE do the following:

- Rescind the Violation Notice dated October 25, 2019 for the reasons provided above.
- Allow VE to feed up to 3.16E-02 lbs/MMBtu to No. 11 Boiler until the next compliance test is completed. This is the current limit and based on average removal efficiencies from past testing and the 2019 engineering and compliance testing shown in Attachment 1, will ensure the emission limit of 2.2E-02 lbs/MMBtu out of the stack is met.

VE takes compliance with all environmental requirements very seriously. Thank you for your consideration in this important matter and please contact me at 906-233-2772 if you have any questions.

Sincerely,

William Racine, P.E.
Environmental Manager

Enc:

Electronic CC w/enc: Jeff Maule (VE), Todd Downey (VE), Adam Becker (VE), Jason Sundquist (VE), Tom Gasloli (EGLE), Karen Kajiya-Mills (EGLE), Mary Ann Dolehanty (EGLE), File 8.3.1

Attachment 1

2015

No. 11 Boiler Operating Parameters - Test 2

	Date & Time	Fuels	tons/day	Wet tons/hour	Wood/TDF/ Sludge Feed (tons/day)	Wood/TDF/ Sludge Feed Ratio (% wt)	Wet Heat Value (btu/lb)	Heat Input mmbtu/hour	Gas Heat Input mmbtu/hr	Total mmbtu/hour	Steam Flow (KPPH)	Excess Oxygen (O2 trim control)	Opacity (%)	Stack O2	Fuel HCl loading (lb/mmBtu)	HCl Emissions Rate (lb/mmBtu)	HCl Removal Efficiency
Run 4		Coal B	108	4.5	NA		12,793	115	0	694.7	464	5	6.41	8.67	3.14E-02	1.10E-02	65.01%
	Start	Coal C	192	8.0	NA		11,732	188									
	11/11/2015 15:38	Wood	918	38.3	918	100.0%	5,123	392									
	Stop	Sludge	0	0.0	0	0.0%											
	11/11/2015 16:43	TDF	0	0.0	0	0.0%											
Run 5		Coal B	111	4.6	NA		12,793	118	0	722.5	485	4	4.37	7.84	3.10E-02	1.10E-02	64.46%
	Start	Coal C	186	7.8	NA		11,732	182									
	11/12/2015 8:20	Wood	989	41.2	989	100.0%	5,123	422									
	Stop	Sludge	0	0.0	0	0.0%											
	11/12/2015 9:24	TDF	0	0.0	0	0.0%											
Run 6		Coal B	122	5.1	NA		12,793	130	0	732.6	538	3	4.47	7.53	3.28E-02	1.50E-02	54.26%
	Start	Coal C	207	8.6	NA		11,732	202									
	11/12/2015 9:43	Wood	938	39.1	938	100.0%	5,123	401									
	Stop	Sludge	0	0.0	0	0.0%											
	11/12/2015 10:49	TDF	0	0.0	0	0.0%											
Averages:		Coal B	113	4.7			17%	120.8	0.0	716.6	495.5						
		Coal C	195	8.1			27%	190.8									
		Wood	949	39.5			57%	405.0									
		Sludge	0	0.0													
		TDF	0	0.0													

2016

No. 11 Boiler Operating Parameters - Test 2

	Date & Time	Fuels	tons/day	Wet tons/hour	Wood/TDF/ Sludge Feed (tons/day)	Wood/TDF/ Sludge Feed Ratio (% wt)	Wet Heat Value (btu/lb)	Heat Input mmbtu/hour	Gas Heat Input mmbtu/hr	Total mmbtu/hour	Steam Flow (KPPH)	Excess Oxygen (O2 trim control)	Opacity (%)	Stack O2	Fuel HCl loading (lb/mmBtu)	HCl Emissions Rate (lb/mmBtu)	HCl Removal Efficiency
run 4	Start	Coal	144	6.0	NA		12,493	150	0	599.0	387	5	4.49	8.22	2.73E-02	8.70E-03	68.18%
	8/31/2016 9:00	Wood	1197	49.9	1197	100.0%	4,500	449									
	Stop	Sludge	0	0.0	0	0.0%		0									
	8/31/2016 10:15	TDF	0	0.0	0	0.0%		0									
run 5	Start	Coal	179	7.5	NA		12,493	187	0	639.3	458	4	4.47	5.72	3.22E-02	1.40E-02	56.59%
	8/31/2016 11:05	Wood	1207	50.3	1207	100.0%	4,500	453									
	Stop	Sludge	0	0.0	0	0.0%		0									
	8/31/2016 12:15	TDF	0	0.0	0	0.0%		0									
run 6	Start	Coal	181	7.5	NA		12,493	188	0	627.6	454	5	4.42	6.11	3.52E-02	1.20E-02	65.88%
	8/31/2016 13:10	Wood	1172	48.8	1172	100.0%	4,500	440									
	Stop	Sludge	0	0.0	0	0.0%		0									
	8/31/2016 14:20	TDF	0	0.0	0	0.0%		0									
Averages:		Coal	168	7.0				175	0	622.0	433						
		Wood	1192	49.7				447									
		Sludge	0	0.0				0									
		TDF	0	0.0				0									

2019 Engineering Run

No. 11 Boiler Operating Parameters - 2019 ENGR HCl Test

	Date & Time	Fuels	tons/day	Wet tons/hour	Wood/TDF/ Sludge Feed (tons/day)	Wood/TDF/ Sludge Feed Ratio (% wt)	Wet Heat Value (btu/lb)	Heat Input mmbtu/hour	Gas Heat Input mmbtu/hr	Total mmbtu/hour	Steam Flow (KPPH)	Excess Oxygen (O2 trim control)	Opacity (%)	Stack O2	Fuel HCl loading (lb/mmBtu)	HCl Emissions Rate (lb/mmBtu)	HCl Removal Efficiency
ENGR Run 1		Coal B	102	4.2	NA		12,541	106	110	566.6	507	4.6	4.52	8.49	3.28E-02	6.00E-04	98.17%
	Start	Coal C	0	0.0	NA												
	8/21/2019 9:42	Wood	935	39.0	935	100.0%	4,500	351									
	Stop	Sludge	0	0.0	0	0.0%											
	8/21/2019 10:32	TDF	0	0.0	0	0.0%											
ENGR Run 2		Coal B	101	4.2	NA		12,541	106	0	473.8	468	6.1	4.04	9.25	3.95E-02	5.00E-03	87.33%
	Start	Coal C	0	0.0	NA												
	8/21/2019 11:35	Wood	981	40.9	981	100.0%	4,500	368									
	Stop	Sludge	0	0.0	0	0.0%											
	8/21/2019 12:25	TDF	0	0.0	0	0.0%											
ENGR Run 3		Coal B	101	4.2	NA		12,541	106	0	440.9	491	5.5	3.89	8.85	4.17E-02	8.10E-03	80.58%
	Start	Coal C	0	0.0	NA		12,541	0									
	8/21/2019 13:02	Wood	893	37.2	893	100.0%	4,500	335									
	Stop	Sludge	0	0.0	0	0.0%											
	8/21/2019 13:52	TDF	0	0.0	0	0.0%											
	ave:	Coal B	101	4.2			23%	106.1	36.6	493.8	488.5						
		Coal C	0	0.0			0%	0.0									
		Wood	936	39.0			77%	351.1									
		Sludge	0	0.0													
		TDF	0	0.0													

2019 Compliance Test

No. 11 Boiler Operating Parameters - Test 2

	Date & Time	Fuels	tons/day	Wet tons/hour	Wood/TDF/ Sludge Feed (tons/day)	Wood/TDF/ Sludge Feed Ratio (% wt)	Wet Heat Value (btu/lb)	Heat Input mmbtu/hour	Gas Heat Input mmbtu/hr	Total mmbtu/hour	Steam Flow (KPPH)	Excess Oxygen (O2 trim control)	Opacity (%)	Stack O2	Fuel HCl loading (lb/mmBtu)	HCl Emissions Rate (lb/mmBtu)	HCl Removal Efficiency
run 4		Coal B	101	4.2	NA		12,762	108	0	459.5	370	7.9	3.75	11.51	3.78E-02	1.80E-02	52.37%
	Start	Coal C	0	0.0	NA												
	8/21/2019 15:50	Wood	952	39.7	952	100.0%	4,430	352									
	Stop	Sludge	0	0.0	0	0.0%											
	8/21/2019 17:14	TDF	0	0.0	0	0.0%											
run 5		Coal B	101	4.2	NA		12,762	108	0	447.0	402	7.3	3.76	10.80	3.86E-02	2.40E-02	37.90%
	Start	Coal C	0	0.0	NA												
	8/21/2019 17:32	Wood	919	38.3	919	100.0%	4,430	339									
	Stop	Sludge	0	0.0	0	0.0%											
	8/21/2019 18:58	TDF	0	0.0	0	0.0%											
run 6		Coal B	101	4.2	NA		12,762	108	0	565.6	438	6.4	3.77	10.12	3.22E-02	2.90E-02	9.96%
	Start	Coal C	0	0.0	NA		12,762	0									
	8/21/2019 19:15	Wood	1240	51.7	1240	100.0%	4,430	458									
	Stop	Sludge	0	0.0	0	0.0%											
	8/21/2019 20:40	TDF	0	0.0	0	0.0%											
	ave:	Coal B	101	4.2			22%	107.9	0.0	490.7	403.1						
		Coal C	0	0.0			0%	0.0									
		Wood	1037	43.2			78%	382.8									
		Sludge	0	0.0													
		TDF	0	0.0													

Attachment 2

Advanced Industrial Resources, Inc.

Test Results - Preliminary Engineering

Verso Escanaba LLC

Escanaba, Michigan

No. 11 Boiler

Notes:

1) F-factor (Fd) & Oxygen (%) provided by facility.

2) Calculated via EPA Method 19 Eq. 19-1 - lb HCl/MMBtu = ppm x 9.462 x 10^-8 x Fd x 20.9/(20.9-O2%)

3) Emission limits established in 40 CFR 63 DDDDD Table 2

		Units	Run 1	Run 2	Run 3
Test Date			21-Aug-19	21-Aug-19	21-Aug-19
Start Time FTIR HCl			9:32	11:36	13:02
End Time FTIR HCl			10:22	12:25	13:52
Firing Rate					
F_d [1]	F-factor - weighted; facility provided	dscf/MMBtu	9,465	9,465	9,644
HCl FTIR CEMS Engineering only - not to be included in Final Test Report					
Oxygen concentration					
O2% [1]	Oxygen percent	%	7.50	7.20	8.30
Hydrogen chloride Concentrations via HCl CEMS					
c_{HCl}	Conc. of HCl in dry stack gas	ppm	0.43	3.64	5.34
		mg/dscm	0.65	5.52	8.10
		gr/dscf	0.000285	0.002410	0.003536
Hydrogen chloride Mass Rates via HCl CEMS					
E_{HCl}	Emission rate of HCl	lb / MMBtu	6.0E-04	5.0E-03	8.1E-03
E_{HCl} All[3]	Allowable HCl Emission Rate	lb / MMBtu	2.2E-02	2.2E-02	2.2E-02
% of All	% of Allowable	%	3%	23%	37%

Attachment 3

Advanced Industrial Resources, Inc.

Test Results - HCl

Verso Escanaba LLC

Escanaba, Michigan

No 11 Power Boiler

Notes:

1) tpy-tons per year assumes continuous operation or 8760 hours per year

2) Heat input determined from facility provided weighted F-factor (F_d)

3) Emission limits established in 40 CFR 63 DDDDD Table 2

			Condition #1			
		Units	Run 1	Run 2	Run 3	Average
Test Date			21-Aug-19	21-Aug-19	21-Aug-19	
Start Time M5,26A			15:50	17:32	19:15	
End Time M5, 26A			17:14	18:58	20:40	
P_{in}	Pressure of meter gases	inches Hg	29.98	29.98	29.97	**29.98**
P_s	Pressure of stack gases	inches Hg	29.84	29.84	29.84	**29.84**
$V_{m(std)}$	Volume of gas sample	dscf	41.68	41.64	41.80	**41.71**
$V_{w(std),meas}$	Meas. volume of water vapor	scf	6.50	6.02	6.07	**6.20**
$B_{ws,meas}$	Measured moisture	dimensionless	0.135	0.126	0.127	**0.129**
$B_{ws,theo}$	Theoretical max. moisture		1.000	1.000	1.000	**1.000**
$B_{ws,act}$	Actual moisture		0.135	0.126	0.127	**0.129**
M_d	Mol. Wt. Of gas at DGM	lb./lb.-mole	29.89	29.82	29.83	**29.85**
M_s	Mol. Wt. Of gas at stack	lb./lb.-mole	28.29	28.33	28.33	**28.31**
v_s	Velocity of stack gas	ft./sec	35.69	35.45	35.26	**35.47**
A_n	Area of nozzle	ft^2	0.000491	0.000491	0.000491	**0.000491**
A_s	Area of stack	ft^2	153.94	153.94	153.94	**153.94**
Gas Stream Flow Rates						
Q_a	Vol. Flow rate of actual gas	cfm	329,683	327.448	325,644	**327,592**
Q_{sd}	Vol. Flow rate of dry gas	dscfm	176,515	176,972	175,563	**176,350**
I	Isokinetic sampling ratio	percent	102.9	102.5	103.7	**103.1**
Firing Rate						
P (heat input)	Fuel firing rate[2]	MMBtu/hr	509	471	475	**485**
% O_2 @ stack	Percent O2 by volume@stack	percent (v/v)	11.2	12.0	11.8	**11.7**
Hydrogen ChlorideConcentrations Method 26A						
c_{HCl}	Conc. Of HCl in dry stack gas	ppm	9.3	11.4	13.7	**11.4**
c_{HCl}	Conc. Of HCl in dry stack gas	mg/dscm	14.1	17.2	20.7	**17.4**
c_{HCl}	Conc. Of HCl in dry stack gas	gr/dscf	0.0062	0.0075	0.0090	**0.0076**
Hydrogen Chloride Mass Rates Method 26A						
c_{HCl}	Conc. of HCl in dry stack gas	lb/hour	9.35	11.41	13.61	**11.46**
c_{HCl}	Conc. of HCl in dry stack gas	lb / MMBtu	1.8E-02	2.4E-02	2.9E-02	2.4E-02
$E_{HCl\ All}$[3]	Allowable HCl Emission Rate	lb / MMBtu	2.2E-02	2.2E-02	2.2E-02	**2.2E-02**
% of All	% of Allowable	%	83%	110%	130%	**108%**
Method 19 Calculation at 8% O2						
c_{HCl}	Conc. of HCl in dry stack gas	lb / MMBtu	1.4E-02	1.7E-02	2.0E-02	1.7E-02
$E_{HCl\ All}$[3]	Allowable HCl Emission Rate	lb / MMBtu	2.2E-02	2.2E-02	2.2E-02	**2.2E-02**
% of All	% of Allowable	%	63%	77%	91%	**77%**