INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT Indianapolis

OFFICE MEMORANDUM

То:	Rick Massoels	Date: July 27, 2021
From:	Michael T. SingerMTS	Thru: Dave Cline
Subject:	Cokenergy, LLC Source ID: 089-00383 City: East Chicago Protocol Reviewer: JCF Test Company: TRC Environmental Cor	Permit Number: T089-41033-00383 County: Lake Field Observer: None poration
procedures		this report and found the sampling ptable to this office. A copy of the he following is a summary of the test
Date of tes	: HRCC with waste heat boilers t: June 9,2021 e: Consent Decree (18-cv-35) l: N/A	# 256968
Pollution C	ontrol Equipment: Lime spray dryer d	lesulfurization unit and baghouse syst

Pollution Control Equipment: Lime spray dryer desulfurization unit and baghouse system. Permitted APCD Parameters: Pressure drop range of 4.0 to 13.0 inches of water. APCD Parameters During Testing: Baghouse 1 pressure drop of 8.15 to 8.20 inches of water. Baghouse 2 pressure drop of 7.89 to 7.97 inches of water.

the test

Pollutants:PbTest methods:1,2,3A,4,12Maximum Operating Rate:960 kpph* (main steam flow)Average Operating Rate During Test:755 kpph* (main steam flow)Pb Limit:0.19 lbs/hr** (326 IAC 2-2)Pb Emission Rate:0.002 lbs/hr

Status: In Compliance (at 79% maximum permitted capacity)

*NOTE: The source's air permit does not describe the maximum capacity of the HRCC waste gas stream. However, the source provided the steam flow data for each test run in terms of kilo pounds per hour (kpph). This method of operating rate measurement, as well as the 79% operating rate during the test, is consistent with the prior Pb compliance test conducted on this unit.

**NOTE: The Pb emission limit for Stack ID 201 is an average over a six (6) hour period and is contained under Indiana Harbor Coke Company L.P permit number 089-41059-00382, Condition D.1.4(a).

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SOURCE: JNIT TESTED: TESTING COMPANY:	Cokenergy, LLC HRCC with Waste Heat Bollers TRC Environmental Corporation			Point No.	Meth Ap	od 2 <u>¥0.0</u> 1.09544
ATE OF TEST:	June 9, 2021			2	12 1.2 1.2	1.09544
trea of Stack (enter diameter	in Inches). As			4	1.2	1.09544
L= W=	0			6 7	0.92	0.95916
diameter (m) = No. of Stacks = Area Stack (R^2) =	216 1 254,469			8	1.2	1.09544 1.04880 1.04880
Molecular Weight of Stack Ga				10 11 12	1.1	1
%CO2 = %O2 =	6.176153631 M	ethod 3A? Yes		13	1.2	1.09544
Md (a/amol) =	29.47 E	quation 3-1		15 16	1.2 1.2	1.09544
folume of Dry Gas Collected Start Meter Volume (cf) =	762.5			17	1	1
End Meter Volume (cf) = Vol. Int. Leak Checks (cf) = Vm (cf) =	822.825 0 60.325			19 20	1.1 1.1 1.1	1.04880 1.04880 1.04880
Vm (dscf) =		quation 5-1		21 22 23	1.1	1.04880
folume of Water Vapor Collect Vic (mL) =	ted @ STD, COND., Vw 221.2			24	1.1	1.04880
Vw (scf) ≃	10.41 E	quation 5-2		26		
Noisture Content of Stack Ga Bys =	15.61%	euation 5-3 15.61%	Sat. Moist. 100.00%	28 29		
1-B∧s ≈	84.39%	84.39%	0.00%	30		
Ns (g/gmol) =	s. Ms 27.68 E	quation 2-6		32 33 34		<u> </u>
bsolute Pressure, Ps Static (in H2O) =	-1.2			34 35 36		
Ps (in Ha) =	29.02			37 38		
stack Gas Velocity, Vs Co	0.84			39 40		
Vs (fps) ≃	72.09 E	quation 2-7		41 42		
Stack Gas Flowrate, Qs Os (acfm) =	1100628.74			43 44		
Stack Gas Flowrate & STD. C	OND., Dry Basis, Ostd 39073360.75 E	ouation 2-8		45 46		1
Ostd (dscfn) = Ostd (dscfm) =	39073360.75 E	gu3101 2-8		47		
Velocity at the Hozzle. Vn Dia. of Nozzle (in)	-L 0.205 A	n (ft*2) =	An 0.000229211	49 50 AVG	1.110	1.05
Time of Run (min) = Vn (fps) =	96 72.06	n (n-2)	0.000229211		1.801	1 1.05 1
				Delta H£te Pb (in Hg) = gamma =	29.11	1
% isokinetic, %1 %1 = Intermediate (%1) =	99.96 100.03	PASS	Equation 5-8	Post Test Cal		Pass
Particulate Emissions Test R Pollutant Mass Emission Rate,	PMR			Antimony (Sb) Pollutant Mass I	mission Rate	e, PMR
Mo (mg	Filterable	Condensible	Total		Mn (ug) Mn (ma)	12250000
Mn (g) =	0	0	0		Mn (a) Mn (g) =	
	0.000			F	MR (lbs/hr) =	0.00
PMR (lbs/hr) =		0.000	0.00000			
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Concentration, gr/dscf ar/dscf = Concentration, mg/dcsm	0.00000	0.00000	0.00000		qı/dscf ≈ mg/dcsm	
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Concentration, gr/dscf gr/dscf = Concentration, mg/dcsm mg/dscm = Pol(utant Mass Emission Rat Production (libit) Production (libit) Production (libit)	0 0000 0 0000 0 0 0000 0	0.00000 0.00000 0.00000 0.00000 Mn (up) Mn	0 00000 0 00000 1 50000 0 0000 0 000 0 0000 0 00000 0 0000 0 0000 0 0000 0 0000 0 0000 0 0000 0 0000 0 00000 0 000000 0 000000 0 000000 0 000000 0 0000000 0 0000000 0 00000000	Concentration, r. Antimony (Bb) Throughout Bb Production Production Production Production Concentration, Concentration, Beryllium (Be) Forduction Producti	andster = mgdicem = mgdicem = mgdicem = mgdicem = (bbh) = (bbh) = mgdicem =	
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3	1.2	1.09544512	271	<u>1.3</u> 1.3	85
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6	0.92	0 9591663	270	1	86
7	12	1.09544512 1.09544512 1.04880885	271	1.3	88
8	1.2	1.09544512	271 270	1.3	87 88
10	1.1	1.04880885	270	1.2	88
11	1	1	270	1.1	88 88
12	1	1 1.09544512	270	1.1	89
13	12 12 12	1.09544512	271 271	1.3	88 88
19	1.2	1.09544512	271	1.3	89
16	1.2	1.09544512	271	1.3	89
17		1	271	<u>1.1</u>	89
18	1.1	1.04880885	271 271	1.1	90 87
20	1.1	1.04880885	271	1.2	87 88
21	1.1	1.04880885	270	1.2	88
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Pb (in Hg) gamma Post Test Ca	≈ 0.991 1 1.000	Pass	•		
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Pie (a Ho) gamma Post Test Ca Pollutant Mass Pollutant Mass Pollutant Mass Concentration Concentration Concentration Beryfillum (Beryfillum (Image Description 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 Marrison Marrison Marrison <t< td=""><td> p.PA/R 0 0.000 0.000 0.000 0.000 e e p.PA/R 0.000 </td><td></td><td>Politant Kass Emission Mn (og) Mn (or) PHR (be.ht) = Concentration, pridset aid/set = Concentration, mg/distm md/serm Production (or) Production (or) Producti</td><td>Rate, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0</td></t<>	 p.PA/R 0 0.000 0.000 0.000 0.000 e e p.PA/R 0.000 		Politant Kass Emission Mn (og) Mn (or) PHR (be.ht) = Concentration, pridset aid/set = Concentration, mg/distm md/serm Production (or) Production (or) Producti	Rate, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pe (n Hg) gamma Post Test Ca Antimory (51 Pollutant Mass Concentration Concentration Concentration Antimory (51 Products Produ	B 0.991 1 0.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 Ma (m) Ma (m) Ma (m) Ma (m) Ma (m) maddscer mddscer mddscer mddscer mddscer nd (math) = n (bach) = m (bach) =	PAR 0		Politant Kass Emission Mn (ug) Mn (ug) Ph/R (teshn) = Concentration, pri/stel and/stel = Concentration, mri/stesm mrd/stem = Arsenic (As) Emission Throubhort Based Production (toth) = Production (toth) = Concentration, mg/distm malskim = Cadenium (cd) Emission	Rate, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (n. Ho) <u>aurman</u> Post Test Ca PoButant Mass PoButant Mass Concentration Concentration Antimony (St Productic Pro	Image Description 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 Ma (ma) Ma (ma) Ma (ma) Ma (ma) Ma (ma) .gi/dscf ma/dscm* .gi/dscf	 p.PA/R 0 0.000 0.000 0.000 0.000 e e p.PA/R 0.000 		Politant Kass Emission Mn (og) Mn (or) Mn (of) PMR (bish) Concentration, pristel andref = Concentration, mastern modiscre Arsenic (A) Emission F Throubrout Based Production (bish) = Production (bish) Production (bish) Production (bish) Production (bish) Production (bish) Production (bish) Mn (og) PMR (bisho) Cadmium (Cd) Test Res Politation, pristel Mn (og) Concentration, pristel andref Concentration, pristel Concentration, pristel	Rate, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (n. Ho) <u>aurman</u> Post Test Ca PoButant Mass PoButant Mass Concentration Concentration Antimony (St Productic Pro	B 0.991 1 0.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 Ma (m) Ma (m) Ma (m) Ma (m) Ma (m) maddscer mddscer mddscer mddscer mddscer nd (math) = n (bach) = m (bach) =	PMR 0		Politant Kass Emission Mn (og) Mn (or) PMR (losh) PMR (losh) Concentration, prifet andriste andriste Concentration, my desm modistem Production (losh) Production (losh) Concentration, gridsat Concentration, gridsat Concentration, gridsat Production (losh) Concentration, gridsat Production (losh) Concentration, gridsat Concentration, gridsat Production (losh) Concentration, gridsat Production (losh)	Relo, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (or Ho) gamma Post Test Ca Antimory (5) Pollutant Mass Pollutant Mass Concentration Concentration Antimory (5) Througheut Productic Product	a 0.991 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 Mn (ua) Mn (ua) Mn (ua) Mn (ua) Mn (ub) maidscme maidscme maidscme 1 Jased 3 Net (Result) 1 Test Results Mn (ub) maidscme 1 Test Results 1 Test Result	> PAR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Politianti Kass Emission Mn (tog) Mn (tog) Mn (tog) PMR (besht) Concentration, prifets and/sct = Concentration, mrides m mrd/scm = Araselic (A) Emission Throubput Based Production (tog) Production (tog) Production (tog) Production, mg/sctm mrd/scm = Candhum (cd) Trasi Res Production, mg/sctm mrd/scm = Candhum (cd) Proside Concentration, mg/sctm mrd/scm = Candhum (cd) Production (tog) Production	Relo, PWR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (on Ho) somma Post Test Ca Post Test	Image D 5931 1 1.0000 1 1.0000 1 1.0000 1 1.0000 1 1.0000 1 1.0000 1 1.0000 Marrie 1.0010 Marrie 1.00100 Marrie 1.00100 Marrie 1.001000 Marrie 1.001000 Marrie 1.0010000	PAR 0 0 0000 0 000 0		Politidanti Kass Ernission Mn (og) Mn (or) Mn (of) PHR (bisch) Concentration, pridset andrace Concentration, modisme Arasenic (A) Ernission F Throubrup Based Production (bithy) = Production (bithy) = Production (bithy) = Production (bithy) = Production (bithy) = Production (bithy) = Production (bithy) = Cademium (cd1 Fest Res Politidanti Mass Ernission Mn (trial Mn (trial Mn (trial) Mn (trial) Cademium (cd1 Fest Res andrace) Cademium (cd1 Fest Res Production (bithy) = Production (bithy) = Production (bithy) = Production (bithy) = Production (bithy) = Production (bithy) = Production (bithy) =	Relo, PWR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (on Ho) somma Post Test Ca Post Test	Image Description 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 Marrison Ration 1.001 Marrison	PA/R 0 0 0000 000 000 000 000 00 000 00 000 000 00000 00000 0000 0000 00000 0000 0000 000		Politiant Kass Emission Mn (og) Mn (og) PHR (beshi) Concentialion, pridst and disc = Concentialion, mid sim midiscre Concentialion, mid sim midiscre and disc and disc Production (to holy = Production (to holy = Productio	Relo, PH/R 0 0000 - 000 0 000 - 000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (on Ho) somma Post Test Ca Post Test	Image Description 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 Mn (m) Mn (m) Mn (m) Mn (m) Mn (m) Mn (m) Mn (m) Mn (m) Mn (m) mad/scare mad/scare mad/scare mad/sca	PMR 0		Politant Kass Emission Mn (cg) Mn (cg) Mn (cg) Mn (cg) PMR (bs/n) Concentration, pristel and/scf = Concentration, mg/stram mc/storm = Preduction (cg/sh) = Preduction (cg/sh) = Preduction (cg/sh) Preduction (cg/sh) Preducti	Relo, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (on Ho) somma Post Test Ca Post Test	B 0591 1 1000 1 1 1000 1 1 1000 1 1 1000 1 1 1000 1 1 1000 1 1 1000 1 1 1000 Ma (m) Ma (m) Ma (m) Ma (m) Ma (m) Ma (m) md/dscf addscf md/dscm nd (m) md/dscf nd (m) nd (m) nd (m) nd (m) nd (m) mg/dscf mg/dscf mg/dscf </td <td>• PAR • PAR • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0</td> <td></td> <td>Politant Kass Emission Mn (ug) Mn (ug) Mn (ug) PMR (bashr) = Concentration, prifet andrist = Concentration, my desm modisten = Production (bashr) = Producti</td> <td>Rate, PMR Rate, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0</td>	• PAR • PAR • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0		Politant Kass Emission Mn (ug) Mn (ug) Mn (ug) PMR (bashr) = Concentration, prifet andrist = Concentration, my desm modisten = Production (bashr) = Producti	Rate, PMR Rate, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (on Ho) somma Post Test Ca Post Test	Image Description 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1.001 1.010 Marrie 1.010 Marrie </td <td> PMR 0 0.000 0.000<</td> <td></td> <td>Politidanti Kass Ernission Mn (cg) Mn (rg) Mn (rg) Physical Constraints, private arakteria Concentration, private arakteria Concentration, mg/stram mg/stram Production (brhy) = Production (brhy) = Private (brhy) Candemium (cd) Test Result Mn (cg) Cancenstration, mg/stram mg/stram Cancenstration, mg/stram Cancenstration, mg/stram Production (brhy) = Production (brh</td> <td>Relo, PWR 0 0 0 0 0 0 0 0 0 0 0 0 0</td>	 PMR 0 0.000 0.000<		Politidanti Kass Ernission Mn (cg) Mn (rg) Mn (rg) Physical Constraints, private arakteria Concentration, private arakteria Concentration, mg/stram mg/stram Production (brhy) = Production (brhy) = Private (brhy) Candemium (cd) Test Result Mn (cg) Cancenstration, mg/stram mg/stram Cancenstration, mg/stram Cancenstration, mg/stram Production (brhy) = Production (brh	Relo, PWR 0 0 0 0 0 0 0 0 0 0 0 0 0
Pie (on Ho) somma Post Test Ca Post Test	Image Description 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 1 1.000 Marriel 1.001 Marriel 1.001 <	 PMR 0 0.000 0.000<		Politant Kass Emission Mn (ug) Mn (ug) Mn (ug) PMR (bashr) = Concentration, prifet andrist = Concentration, my desm modisten = Production (bashr) = Producti	Relo, PWR 0 0 0 0 0 0 0 0 0 0 0 0 0

0.000 n, gr/dscf gr/dscf = 0.00E+00

0.00

0 #DIV/0!

0.000 ai/dscf = 0.00E+00

ma/desm ma/dscm ≈ 0.00

 Incances (Mn) Emission Rate

 roughput Based

 Production (Ib/hr) =

 0

 Production (Io/hr) =

 0

 Production (Io/hr) =

 0

 Production (Io/hr) =

 0

 PMR (Ibs.ton)

Arsenic (As) Emission R	
Throughout Based	are
Production (lb/hr) =	0
Production (ton/hr) =	0
Production (ton/hr) =	0
PMR (lbs.ton)	#D/V/01
Cadmium (Cd) Test Res	
Pollutant Mass Emission F	Rate, PMR
Mn (ug)	
Ma (ma)	
Ma (a)	171249173317
Mn (g) =	0
PMR (lbs/hr) =	0.000
Concentration, gr/dscf	
gr/dscf =	0.00E+00
Concentration, mg/dcsm	
ma/dscm =	0.00
nig usen w	
Cadmium (Cd) Emission	Rate
Throughput Based	
Production (lb/hr) =	0
	0
Production (ton/hr) =	
Production (ton/hr) =	0
PMR (lbs/ton)	#D(V/0!
Copper (Cu) Test Result	
Pollulant Mass Emission i	
Mn (uq)	120220300000
Ma (ma)	
Mn (a) =	0
PMR (lbs/hr) =	0.000
Concentration, gridsof	(
ar/dscf =	0.00E+00
1	
Concentration, mo/dcsm	
Concentration, ma/dcsm ma/dscm ≈	0.00
ma'dscm =	0.00
ma/dscm = Copper (Cu) Emission P	0.00
ma/dscm ≖ Copper (Cu) Emission F Throughput Based	[0.00] Late
ma'dscm ≈ Copper (Cu) Emission F Throughput Based Production (ib/hr) =	[0_00] Late
ma'dscm = Copper (Cu) Emission P Throughput Based Production (lb/hr) = Production (lon/hr) =	1 tate
ma'dsem = Copper (Cu) Emission F Throughput Based Production (Ishit) = Production (Ishit) = Production (Ionitu) =	0.00 Late
ma'dscm = Copper (Cu) Emission P Throughput Based Production (lb/hr) = Production (lon/hr) =	1 tate
ma'dsem = Copper (Cu) Emission F Throughput Based Production (Ishit) = Production (Ishit) = Production (Ionitu) =	0.00 Late
ma'dscm = Copper (Cu) Emission R Throughput Based Production (lanht) = Production (lanht) = Production (lanht) = PMR (lbs/ton) Mercury (Ha) Test Resu	0.00 tate 0 #DiV/0!
ma'dsem = Copper (Cu) Emission F Throughput Based Production (ba/hr) = Production (ton/hr) = Physecond PMR (bs:ton)	0.00 tate 0 #DiV/0!
mg/dscm = Copper (Cu) Emission R Throuchput Based Production (Ibht) = Production (Ibht) = Production (Ibht) = Production (Ibht) = PMR (Ibston) Mercury (Ha) Test Resu Pollutant Mass Emission Mn (rub)	0.00 tate 0 #DIV/0! Rate, PM/R
mg/dscm = Copper (Cu) Emission R Throuchput Based Production (Ibht) = Production (Ibht) = Production (Ibht) = Production (Ibht) = PMR (Ibston) Mercury (Ha) Test Resu Pollutant Mass Emission Mn (rub)	0.00 tate 0 #DIV/0! Rate, PM/R
ma'dscm = Copper (Cu) Emission R Throuchput Based Production (Ibht) = Production (Ion/hu) = PKR (Ibs/Ion) Mercury (Ha) Test Resu Pollutant Mass Emission Mn (na) Mn (ma)	0.00 Late 0 #DIV/0! Rate, PMR
maldscm = Copper (Cu) Emission P Throuthput Based Production (bhn) = Production (bhn) = Production (banh) = PWR (bs/ton) Mercury (Ha) Test Resu Poliutant Mass Emission Ma (ca) Ma (ca) Ma (ca)	0.00 tate 0 #DIV/0! Rate, PM/R
maldscm = Cooper (Cu) Emission R Throuchout Based Production (bht) = Production (both) = Production (both) = Production (both) = Production (both) Marcury (Ha) Test Resu Marcury Marcury (Ma) Test Resu Marcury Marcury (Ma) Test Resu Marcury Marcur	0.00 (ate 0 #DiV/0) Rate_PM/R Rate_PM/R
maldscm = Copper (Cu) Emission P Throuthput Based Production (bhn) = Production (bhn) = Production (banh) = PWR (bs/ton) Mercury (Ha) Test Resu Poliutant Mass Emission Ma (ca) Ma (ca) Ma (ca)	0.00 (ate 0 #DiV/0) Rate_PM/R Rate_PM/R
maldscm = Cooper (Cu) Emission P Throuchout Based Production (bht) = Production (both) = Production (both) = Production (both) MR (both) MR (both) Ma (mai Mr (a) = PNR (bs/hu) =	0.00 (ate 0 #DiV/0) Rate_PM/R Rate_PM/R
maldscm = Copper (Cu) Emission R Throuchout Based Production (bht) = Production (barht) = Production (barht) = PRR (bstron) Marcury (Ha) Test Resu Politant Mass Emission Mar (a) Mar (a) Mar (a) PRR (bstron) = PRR (bstron) =	0.00 late 0 3 sD(V/0) Rse_Pf/92 0 0.0000
maldscm = Cooper (Cu) Emission P Throuchout Based Production (bht) = Production (both) = Production (both) = Production (both) MR (both) MR (both) Ma (mai Mr (a) = PNR (bs/hu) =	0.00 (ate 0 #DiV/0) Rate_PM/R Rate_PM/R
maldiscne = Copper (Cu) Emission F Production (Rht) = Production (Rht) = Mar (Cu) Mar (0.00 late 0 3 sD(V/0) Ns Rate, Pf/92 0 0,0000
maldscm = Copper (Cu) Emission R Throuchput Based Production (binh) = Production (contra) = Production (contra) = PRR (bistron) Marcury (Ha) Test Resu Poliutant Mass Emission Mar (ca) Mar (ca) Mar (ca) Mar (ca) PRR (bistra) = Concentration, arXist	0.00 late 0 3 sD(V/0) Ns Rate, Pf/92 0 0,0000

1.21 86.97916667

87 88 88

Concentration. mo/dcsm mo/dscm ≈	0.00
incrusein «	0.00
Mercury (Ha) Emission F	late
Throughput Based	
Production (ib/hr) =	0
Production (ton/hr) =	0
Production (ton/hr) =	0
PMR (lbs/ton)	\$D/V/01

OURCE:	Cokenergy, LLC		
JNIT TESTED: TESTING COMPANY: DATE OF TEST:	HRCC with Waste Heat Boilers TRC Environmental Corporation June 9, 2021		
RUN NO.:	2011		
trea of Stack (enter diameter)	er in Inches). As		
W=	0 216		
diameter (in) = No. of Stacks =	216 1 254,469		
Area Stack (ft*2) ≈			
Nolecular Weight of Stack %CO2 =	5.793650255		
%O2 = Md (q/gmol) =	12.36562066 29.42	Equation 3-1	
volume of Dry Gas Collecte	d & STD. COND., Vm B25.3		
Start Meter Volume (cf) = End Meter Volume (cf) =	888.015		
Vol. Int. Leak Checks (cf) = Vm (cf) =	62.715		
Vm (dscf) =	58.417	Equation 5-1	
Volume of Water Vapor Col Vic (mL) =	lected & STD. COND., Vw 215.2		
Vw (scf) =	10.13	Equation 5-2	
Moisture Content of Stack	Gas, Bws	Equation 5-3 14.77%	Sat. Moist. 100.00%
1-8vs =	85.23%	85.23%	0.00%
Molecular Weight of Stack	Gas. Ms 27.73	F	
Ms (q/qmol) ≈	27.75	Equation 2-6	
Absolute Pressure, Ps Static (in H2O) =	-1.2		
Ps (in Ha) =	29.02		
Stack Gas Velocity, Vs Cp =	0.84		
Vs (fps) =	72.26	Equation 2-7	
Stack Gas Flowrate. Qs Qs (acfm) =	1103300.66		
Stack Gas Flowrate & STD			
Ostd (dscfn) = Ostd (dscfm) =	39576440.62 659607.34	Equation 2-8	
Velocity at the Nozzle. Vn Dia. of Nozzle (in) =	0.205	Area of Nozzle An (ft*2) =	An 0.00022921
Time of Run (min) = Vn (fps) =	96 74.01		
% isokinetic, %1 %1 =			
Intermediate (%) =	102.41 102.48	PASS PASS	Equation 5-8
Particulate Emissions Test Pollutant Mass Emission Rat	Results		
	Filterable	Condensible	Totai
Mn (mg Mn (g) Mn (g) =	0	0	0
Mn (g) ≅ PMR (lbs/hr) =	0.000	0.000	0.00000
Concentration, gr/dsct			
gr/dscf =	0.00000	0.00000	0.00000
	1	0.00000	0.0000
Concentration, mg/dcsm mq/dscm ≃	0.00000		0.00000
ma/dscm ≈	0.00000		
mq/dscm ≃ Poliutant Mass Emission F	0.00000		
ma'dscm ≈	0.00000 tate, Throughput Based	0.00000	0.00000
moidsom ⇔ Pollutant Mass Emission F Production (Ibht) + Production (Ion/ht) +	0.00000		
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 Late, Throughput Based 0 Fiterable #DVV0! Barium (Ba) Test Results	0.00000 Condensible #DIV/01	0.00000 Totai
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0.00000 (ate, Throughput Based 0 Filterable \$DW/0!	Condensible #DIV/0!	0.00000 Totai #DRV/0!
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 00000 Late, Throughput Based 0 Fiterable #DVV0! Barium (Ba) Test Results	Condensible #D(V.0) /R Mn (ug) Mn (ma) Mn (ma)	0.00000 Totai \$DNV/0
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 Late, Throughput Based 0 Fiterable #DVV0! Barium (Ba) Test Results	0.00000 Condensible #D(V.0) MR Mn (ug) Mn (ug) =	Total #DN/01
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 Late, Throughput Based 0 Fiterable #DVV0! Barium (Ba) Test Results	0 00000 Condensible #DIV/0! Mn (ug) = PMR (lbs/hr) =	Total 2D/V/02
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 Inte, Throughput Based 0 Piterable #ENVIO Barlum (Ba) Test Results Poliutant Mass Emission Rate, Ph	0 00000 Condensible #DIV/0! Mn (ug) = PMR (lbs/hr) =	Total 2D/V/02
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 00000 Inte, Throughput Based 0 Piterable #ENVIO Barlum (Ba) Test Results Poliutant Mass Emission Rate, Ph	0 00000 Condensible 2DV/0! Mn (ug) Mn (ug) Mn (a) = PMR (bs/hr) ar/dscf =	0.00000 Total
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 Inte, Throughput Based 0 Piterable Bortwork Bartum (Ba) Test Results Polytant Mass Emission Rate, Pr Concentration, gr/dscf Concentration, mg/dsm	0 00000 Condensible #DIV/0! Mn (ug) = PMR (lbs/hr) =	0.00000 Total 0 0 0 0
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 Iste, Throughput Based 0 0 Fiterable SOVIO: Bartum (Ba) Yest Results Political Mass Emission Rate, PA Concentration, gr/dssf Concentration, mg/dssf Bartum (Ba) Emission Rate Throughput Based	0 00000 Condensible #DV/01 MR (bg) MR (bg) MR (bg) PMR (bs/hu) = ar/dscf = ma'dscm =	0.00000 Total aDN/0! 0 0.0000 0.0000 0.0000 0.0000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	Concentration, my/dscf Concentration, my/dscf Concentration, my/dscf Concentration, my/dscf Concentration, my/dscf Concentration, my/dscf	Condensible BDV/01 BDV/01 MR (bg) = MR (bg/m) MR (bg/m)	0.00000 Total 0 0 0 0
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	Concentration, gridssf Concentration, gridssf Concentration, gridssf Concentration, gridssf Concentration, myrdssm Barlum (Ba) Emilesion Rate Throughott Based Throughott Based Throughott Gased	Condensible sDV/Of MR Mn (ug) Mn (a) Mn (s) PMR (bs/h) PMR (bs/h) ensible maidscf = maidscf = maidscf =	0.00000 Total aDN/0! 0 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 00000 International Content of the sector 0 Filterable FDV00 Bartum (Ba) Test Results Polytant Mass Emission Rate, PA Concentration, gr/dscf Concentration, mg/dscf Concentration, mg/dscm Bartum (Ba) Emission Rate Throushout Based Production (bn/h) Production (bn/h) Production (bn/h) PMR (bstor)	Condensible sDV/Of MR Mn (ug) Mn (a) Mn (s) PMR (bs/h) PMR (bs/h) ensible maidscf = maidscf = maidscf =	Total
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	Concentration, gridssf Concentration, gridssf Concentration, gridssf Concentration, gridssf Concentration, myrdssm Barlum (Ba) Emilesion Rate Throughott Based Throughott Based Throughott Gased	Candens ible #DV/01 WR Mn (up) Mn (m) Mn (b) PMR (bs/hu) = ar/dscf = ma'dscm = = = = - - - - - - - - - - - - -	0.00000 Total aDr//02 0 0.0000 0.00000 0.00000 0.000000 0.000000 0.000000 0.0000000 0.0000000 0.000000000 0.000000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	Concentration, gr/dssf Concentration, gr/dssf	0 00000 <u>Condensible</u> <u>3DV/01</u> Ma (b) Ma (0.00000 Total 2DV/0? 0 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	Concentration, gr/dssf Concentration, gr/dssf	Condensible BDV00 Mrs (no) Mrs (no) PMR (beshin) PMR (beshin) extension = = = Mrs (hor (beshin) Mrs (hor (beshin)) Mrs (hor (beshin))	0.00000 Total 2DVV.0: 0 0.000E+000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	Concentration, gr/dssf Concentration, gr/dssf	Condensible BDV/01 BDV/01 MR (up) MR (0.00000 Total aDN/0? 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	Concentration, gr/dssf Concentration, gr/dssf	Condensible BDV/01 MR (mail Ma (mail Mail Ma (mail Mail Ma (mail Ma (mail Mail Ma (mail Mail Ma (mail Mail Ma (mail Ma (0.00000 Total 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 00000 International and a set of the set of	Condensible BDV00 Mrs (no) Mrs (no) PMR (beshin) PMR (beshin) extension = = = Mrs (hor (beshin) Mrs (hor (beshin)) Mrs (hor (beshin))	0.00000 Total 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 00000 tate, Throughput Based Pherable SetWoll Concentration, gr/dscf Concentration, gr/dscf Concentration, mg/dscm Barlum (Ba) Emission Rate Phoducion (tonhy) Production (tonhy) Production (tonhy) Phoducion (tonhy) Phoduci	Condensible BDV/01 MR (mail Ma (mail Mail Ma (mail Mail Ma (mail Ma (mail Mail Ma (mail Mail Ma (mail Mail Ma (mail Ma (Total 2.00000 1.00000 0.00000 0.000000 0.000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 0000 1212, Throughout Based 0 Piterable SUV01: Surve1: Surve1: Poliutant Mass Emission Rate, Ph Concentration, gr/dscf Concentration, mg/dscm Batium (Ba) Emission Rate Throughput Based Poduction (bh/n) Production (bh/n) Pro	Condensible aDV/01 #DV/01 WR (main Mn (og) = PMR (blacht) = au/dscf = maidscm = = = = = WR (han (blacht) = Mn (han (blacht) = Mn (blacht) = PMR (blacht) = PMR (blacht) =	Total 2.00000 1.00000 0.00000 0.000000 0.000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 00000 1212, Throughout Based 0 Piterable Sovoit S	Condensible BDV/01 MR (ung) MR (ung) MR (g) = PMR (ghm) MR (ghm) M	Total 5DV/01 0 0 0 0 0 0 0 0 0 0 0 0 0
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 0000 100	0 00000	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.0000000 0.0000000 0.0000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 0000 ite, Throughput Based 0 Piterable string and the second s	0 00000	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.0000000 0.000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 clip, Throughput Based 0 Piterable Sourcestances	Condensible BDV/O BDV/O MR (b) MR (b) MR (c) MR (c)	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.0000000 0.0000000 0.0000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 0000 internation, gridsef Concentration, gridsef Concentration, gridsef Concentration, mg/dsef Concentration,	Condensible BDV/01 BDV/01 WR (maj = Ma (ug) = PMR (bs/hg RMR (bs/hg) =	0.00000 Total 8DV/01 0
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 clip, Throughput Based 0 Piterable Sourcestances	Condensible Condensible Condensible Condensible Condensible Condensible Condensible Marca Marca Marca Condensible Marca Marca Condensible Marca Marc	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.000000 0.0000000 0.00000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 clip, Throughput Based 0 Piterable Sourcestances	Condensible BDV00 AR Mn (up) MR (us) PMR (us) PMR (us) PMR (us) PMR (us) PMR (us) PMR (us) PMR (us) PMR (us) PMR (us) Mn (us) PMR (us) PMR (us) Mn (us) PMR (us) Mn (us) PMR (us) Mn (us) PMR (us) Mn (us) M	0.00000 Total 8.0000 0
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 clip, Throughput Based 0 Piterable Sourcestances	0 00000 2DV001 2DV001 Mn (bc) Mn (bc) Mn (bc) Mn (bc) Mn (bc) maildsem = = Mn (bc) Mn (bc) Mn (bc) Mn (bc) Mn (bc) maildsem = = Mn (bc) Mn (bc) Mn (bc) Mn (bc) Mn (bc) Mn (bc) maildsem = = = = Mn (bc)	0.00000 Total 2050/01 0
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 0000 1212, Throughput Based 0 Piterable Sovoit	Condensible BDV/01 BDV/04 MR (col) MR (col) MR (col) PMR (bs/n) PMR (bs/n) PMR (bs/n) PMR (bs/n) PMR (bs/n) MA (col) MA (col	0.00000 Total 0.00000 0.0000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 0000 1212, Throughput Based 0 Piterable Sovoit	0 00000 aDV/01 aDV/01 Mn (ug) = Mn (ug) = PMR (bls/h) = au/dscf = =	0.00000 Total 0 <td< td=""></td<>
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 0000 its, Throughput Based o Piterable setWoll setWoll setWoll for the Results Poliutant Mass Emission Rate, PA Concentration, my/dssf	0 00000 aDV/01 aDV/01 Mn (ug) = Mn (ug) = PMR (bls/h) = au/dscf = =	0.00000 Total 0.00000 0.0000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 0000 0 Piterable 9 Piterable Piterable Piterable Piterable Piterable Piterable Policiant Mass Emission Rate, Pi Concentration, my/dssf Con	0 00000 aDV001 aDV001 Mn (uo) Mn (uo) maidsen = an/dsef = maidsen = = PMR (bs/h) : an/dsef = Mn (uo) Mn (uo) an/dsef = maidsem = = PMR (bs/h) : an/dsef = Mn (uo) an/dsef = maidsem = = = = PMR (bs/h) : an/dsef = maidsem = =	0.00000 Total 0.00000 0.0000 0.00000 0.000000 0.0000000 0.00000000 0.000000000 0.0000000000 0.000000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 0000 0 Piterable Poly Enterable Concentration, my/dsst Poly Enterable Concentration, my/dsst Poly Enterable Concentration, my/dsst Poly Enterable Concentration, my/dsst Poly Enterable Poly Enterable Concentration, my/dsst Con	Condensible BDV/01 BDV/04 Ma (una) Ma (una) Ma (una) PMR (ush) PMR (ush) PMR (ush) PMR (ush) Ma (una) PMR (ush) PMR (ush) DMA (ush) PMR (ush) DMA (ush) PMR (ush) DMA (ush) PMR (ush) DMA (ush) PMR (ush) DMA (ush) PMR (ush) DMA (ush	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.000000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 clip, Throughput Based 0 Piterable Sourcestances	Condensible BDV/O BDV/O MR (b) MR (b) MR (c) MR (c)	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.00000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 00000 clip, Throughput Based 0 Piterable Sourcestances	Condensible Condensible Condensible Condensible Condensible Condensible Condensible Marca Marca Marca Condensible Marca Marca Condensible Marca Marc	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.000000 0.0000000 0.00000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 0000 1212, Throughput Based 0 Piterable Sovoit	Condensible BDV/01 BDV/04 MR (col) MR (col) MR (col) PMR (bs/n) PMR (bs/n) PMR (bs/n) PMR (bs/n) PMR (bs/n) MA (col) MA (col	0.00000 Total 8.0000 0
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 0000 1212, Throughput Based 0 Piterable Sovoit	0 00000 2DV001 aDV001 Mn (bc) Mn (bc) Mn (bc) mail mail a/dscf = mail Mn (bc) Mn (bc) a/dscf = mail Mn (bc) Mn (bc) Mn (bc) mail mail </td <td>0.00000 Total 2050/01 0</td>	0.00000 Total 2050/01 0
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 0000 0 Piterable Polycology	0 00000 aDV/01 aDV/01 Mn (ug) = Mn (ug) = PMR (bls/h) = au/dscf = =	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000
maidsem = Pollutant Mass Emission F Production (tashr) = Production (tor/hr) = Production (tor/hr) =	0 0000 0 0 Piterable 9 Piterable SERViol Service	0 00000 aDV/01 aDV/01 Mn (ug) = Mn (ug) = PMR (bls/h) = au/dscf = =	0.00000 Total 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 0000 0 Piterable 9 Piterable SERVICE	0 00000 aDV001 aDV001 Mn (uo) Mn (uo) maidsen = an/dsef = maidsen = = PMR (bs/h) : an/dsef = Mn (uo) Mn (uo) an/dsef = maidsem = = PMR (bs/h) : an/dsef = Mn (uo) an/dsef = maidsem = = = = PMR (bs/h) : an/dsef = maidsem = =	0.00000 Total 0.00000 0.0000 0.00000 0.000000 0.0000000 0.00000000 0.000000000 0.0000000000 0.000000000000 0.00000000000000000000000000000000000
maidsem = Pollutant Mass Emission F Production (Ishi) = Production (Ion/hi) = Production (Ion/hi) =	0 0000 0 0 Piterable 0 Piterable Softwork	Condensible BDV/01 BDV/04 Ma (una) Ma (una) Ma (una) PMR (ush) PMR (ush) PMR (ush) PMR (ush) au/dscf = ma/dscf	0.00000 Total 0

P. 1.111. 1	Meth		First Y.
Point No.	AP	<u>160</u>	Stack Temp,
1	1.2	1.095445115	271
2	1.2	1.095445115	271
3	1.1	1.048808848	271
4	1.1	1.048808848	271
5	0.59	0.994987437	270
6	0.99	0.994987437	270
7	1.2	1.095445115	270
8	1.2	1.095445115	270
9	1.2	1.095445115	270
10	1.2	1.095445115	270
11	1.1	1.048808848	270
12	1.1	1.048808848	270
13	1.2	1.095445115	271
14	1.2	1.095445115	271
15	1.1	1.048808848	271
16	1.1	1.048808848	271
17	0.96	0.979795897	270
18	0.96	0.979795897	270
19	1.2	1.095445115	269
20	1.2	1.095445115	269
21	1.2	1.095445115	269
22	1.2	1.095445115	269
23	0.97	0.98488578	269
24	0.97	0.98468578	269
25			
26			
27			
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48		1	L
49			
50			
AVG	1.118	1.057	270.083
Delta H (2=	1.601	1	
Pb (in Hg) =	29,11	1	
	0.991	1	
oamma =	0.9734	Pass	
Post Test Cal	0.9734		
Post Test Cal		-	
			r
Post Test Cal	Test Results Emission Rate,	PMR	
Post Test Cal Antimony (Sb)	Test Results Emission Rate,	PMR	
Post Test Cal Antimony (Sb)	Test Results Emission Rate,	121625333555222	
Post Test Cal Antimony (Sb)	Test Results Emission Rate, Mn (ug)	AND REAL PROPERTY.	
Post Test Cal Antimony (Sb)	Test Results Emission Rate, Mn (ug) Mn (ma)	AND REAL PROPERTY.	

ion, gr/dscf ar/dscf = 0.00E+00

0.00

0 0 #DiV/0!

0 0 0 #DW/01

0 0 #DiV/01

0 0 2DiV/0!

n, mg/dcsm mg/dscm = [___

imony (Sb) Emission Rate oughput Based Production (bh/tu) = Production (ton/tu) = Production (ton/tu) = PMR (bs/ton)

 PAR (bs:de)
 EDV/0!

 Bervillum (Be) Test Results
 Pollutant Mass Emission Rato, PMR

 Mn (ray)
 Mn (ray)

 Mn (ray)
 Mn (ray)

 Mn (ray)
 0

 PMR (bs:hr) =
 0.0000

yllium (Be) Emission Rate ovahput Based Production (Ib/hu) = Production (Ion/hu) = Production (Ion/hu) = PMR (Ibston)

balt (Co) Emission Rate rouchput Based Production (Ib/hi) = Production (Ion/hi) = Production (Ion/hi) = PWR (ibs/ton)

Manganese (Mn) Emission Rate Throughput Based Production (Ib/hr) = Production (Ib/hr) = Production (Io/hr) = Production (Io/hr) =

entration, gr/dscf gr/dscf = ____0.00E+00___ intration, mg/dcsm mg/dscm = _____0.00___

 Image: second second

ntration, or/dscf gr/dscf = 0.00E+00 tion, ma/dcsm ma/dscm = _____0.00

 Print (Usinut)
 201/00

 aanese (Mn) Test Results
 faat Mass

 tant Mass Emission Rate, PMR
 Mn (va)

 Mn (va)
 Mn (va)

 Mn (va)
 Mn (va)

 Mn (va)
 0

 PMR (lbs/hz)
 0.000

tration, qr/dscf qr/dscf = 0.00E+00 ncentration, mg/dcsm mg/dscm = 0.00

	Method 4	
sH	Meter In	Meter Ou
1.3	87	88
1.3	87	68
1.2	87	87
1.2	88	87
1.1	88	87
1,1	89	87
1.3	88	87
1.3	88	87
1.3	88	87
1.3	89	88
1.2	89	88
	90	88
1.2	88	88
1.3	88	88
1.2	88	88
1.2	89	88
1.2	89	88
1.2	89	88
1.3	88	87
1.3	88	87
1.3	89	88
1.3	89	88
1.1	89	88
1.1	90	88
	-	
		1
1.23	88.02	093333

Poliutant Mass Emission F	\$
	ate, PMR
አካ (ug)	11461
Ma (ma)	
Ma (a)	
Mn (g) =	0
PMR (ibs/hr) =	0.000
Concentration, gr/dscf	
	0.00E+00
0/0501	0.000400
Concentration, mg/dcsm	
ma/dscm =	0.00
Arsenic (As) Emission R	ate
Throughput Based	0
Production (ib/hr) =	0
Production (ton/hr) = Production (ton/hr) =	0
Photocolon (ton/hr) = PMR (ibs/ton)	#DIV/01
Cadmlum (Cd) Test Res	ults
Pollutant Mass Emission	Rate, PLIR
Mn (ug	
Mn (ma	
Ma (a	
Mr(g)≖ PMR(bs/hr):	
Private (105/114) *	- 0.000
Concentration, gr/dscf	
gridsof =	0.00E+00
Concentration, mg/dcsm	
maidsom =	0.00
Cadmium (Cd) Emission	. Pata
Throughput Based	i Rate
Production (ib/hr) =	6
Production (ton/tu) =	ŏ
Production (ton/hr) =	0
PMR (lbs/ton)	#D(V/0!
Copper (Cu) Test Resul	ts
Pollutant Mass Emission	Hate, PMR
Mn (bo Mn (mo	
Mn (no	
Mn (g) =	0
PMR (lbs/hr)	
Concentration, gr/dscf	0.0007 000
qr/dscf =	0.00E+00
Concentration, mg/dcsm	
	0.00
ma'dscm =	
ma'dscm =	
Copper (Cu) Emission F	(Ale
Copper (Cu) Emission F Throughput Based	
Copper (Cu) Emission F Throughput Based Production (ໄປໃນ) =	0
Copper (Cu) Emission F Throughput Based Production (Ib/h/) = Production (tor/h/) =	0
Copper (Cu) Emission F Throughput Based Production (Ib/hr) = Production (Io/hr) = Production (Io/hr) =	0
Copper (Cu) Emission F Throughput Based Production (ib/hr) = Production (tor/hr) =	0
Copper (Cu) Emission F Throughput Based Production (Ib/hr) = Production (Ion/hr) = Production (Ion/hr) = PMR (Ibs/Ion)	0 0 0 #D(V/0!
Copper (Cu) Emission F Throughput Based Production (bb/tu) = Production (ton/tu) = Production (ton/tu) = PMR (tbs/ton) Mercury (Hg) Test Resu	0 0 #DIV/0!
Copper (Cu) Emission F Throughput Based Production (Ib/ht) = Production (Ion/ht) = PMR (Ibs/ton) Mercury (Hg) Test Resu Pollutant Mass Emission Mn (tu	0 0 #D(V/0!
Copper (Cu) Emission f Throughout Based Production (lb/ht) = Production (lon/ht) = PMR (lbs/ton) Mercury (Hq) Test Resu Pollutant Mass Emission Mn (ur Mn (ur	0 0 #D(V/0!
Copper (Cu) Emission F Throughput Based Production (Ib/III) = Production (Ion/III) = Production (Ion/III) = PMR (Ibshon) Mercury (Hq) Test Resu Pollutant Mass Emission Mn (un Mn (un Mn (m	0 0 \$D(V/0 #D(V/0
Copper (Cu) Emission I Throuchput Based Production (ib/h) = Production (ic/hu) = Production (ic/hu) = PKR (ibs/on) Mercury (Ha) Test Resu Pollutant Mass Emission Mn (in Mn (in Mn (o) =	0 0 #DN/0 #DN/0 #DN/0
Copper (Cu) Emission F Throughput Based Production (Ib/th) = Production (Ion/th) = Production (Ion/th) = PMR (Ibshon) Mercury (Hq) Test Resu Pollutant Mass Emission Mn (un Mn (un Mn (m	0 0 #DN/0 #DN/0 #DN/0
Copper (Cu) Emission / Throughput Based Production (Ghr) = Production (Ghr) = Production (Ghr)) = Production (Ghr)) = PRR (Ibs/nor) Mercury (Ha) Test Rest Pol/utant Mass Emission Ma (true Ma (true Ma (true PMR (Ibs/hu))	0 0 #DN/0 #DN/0 #DN/0
Copper (Cu) Emission / Throughout Based Production (Ghr) = Production (Ghr) = Production (Ghr) = Production (Ghr) Pollutant Mass Ernission Pollutant Mass Ernission Mn (us Mn (m Mn (a) FMR (Ibsh) Concentration, ar/dscf	0 0 #DRV/01 #DRV/01
Copper (Cu) Emission / Throughput Based Production (Ghr) = Production (Ghr) = Production (Ghr)) = PKR (bishor) Mercury (Ha) Test Rest Pollutant Mass Emission Ma (ur Ma (n) = PMR (bishu)	0 0 #DRV/01 #DRV/01

undaci	0.001.00
Concentration. mg/dcsm mg/dscm #	0.00
Mercury (Hg) Emission R Throughput Based	ate
Production (ib/hr) =	0
Production (ton/hr) =	0
Production (ton/hr) =	Q
PMR (ibs/ton)	#DIV/01

SOURCE: UNIT TESTED: TESTING COMPANY:				r		
UNIT TESTED: TESTING COMPANY:	Covenergy, LLC				Metho	d 2
	Colenergy, LLC HRCC with Waste Heat Bollers TRC Environmental Corporation			Point No.	3p 1.2	1.09544
DATE OF TEST:	June 9, 2021			2	1.2	1.09544
RUH NO.:	3			3 4	1.2	1.09544
Area of Stack (enter diame L =	ler In Inches). As			5	1	1
W=	0			6 7	1.1	1.04680
diameter (in) = No. of Stacks =	216			8	1.1	1.04680
Area Stack (ft*2) =	254,459			10	1.1	1.04880
Molecular Weight of Stack	Gas, Dry Basis, Md			11	0.93	0.96436
%CO2 =	5.670790977 12.6489573			13	1.2	1.09544
%O2 = Md (a/amol) =		Equation 3-1		14 15	1.2	1.09544
Volume of Dry Gas Collect	ed @ STD_COND_Vm			16	1.2	1.09544
Start Meter Volume (cf) =	888.5			18	- i	1
End Meter Volume (cf) = Vol. Int. Leak Checks (cf) =	950.383			19	1.2	1.09544
Vm (cf) =	61.883	Equation 5-1		21	1.2	1.09544
Vm (dscf) =		Equation 5-1		22 23	1.2	1.09544
Volume of Water Vapor Co Vic (mL) =	lected @ STD. COND., Vw 206.6			24 25	0.97	0.98488
Vic (nic) =	9.72	Equation 5-2		26		
Molsture Content of Stack	Gas Rws	Equation 5-3	Sat. Moist.	27 28		
B//5 =	14.43%	14.43% 85.57%	100.00%	29		
1-Bvs =	85.57%	85.5/%	0.00%	30		
Molecular Weight of Stack Ms (g/gmol) =	Gas. Ms 27.77	Equation 2-6		32		
	21.11	2003000 2-0		33 34		
Absolute Pressure, Ps	-1.2			35		
Static (in H2O) = Ps (in Hg) =	29.02			36 37		
				38		
Stack Gas Velocity, Vs Cp =	0.84			39 40		L
Vs (fps) =	71.92	Equation 2-7		41 42		
Stack Gas Flowrate, Qs				43		1
Qs (acfm) =	1098069.60			44 45		
Stack Gas Flowrate @ STI	COND., Dry Basis, Ostd			46		L
Qstd (dscfh) = Ostd (dscfm) =	39648261.31 660804.36	Equation 2-8		47		1
				49		
Velocity at the Nozzle, Vn Dia, of Nozzle (in) =	0.205	Area of Nozzle. An (ft*2) =	An 0.00022921	50 AVG	1.113	1.053
Time of Run (min) =	96 72.57	/		•••••		1
Vn (fps) =	12.5/			Delta Hft= Pb (in Hg) =	1.801 29.11	1
% isokinetic, %ł %i≈	100.90	PASS		gamma = Post Test Cal	0.991 0.9764	Pass
Intermediate (%) =	100.97		Equation 5-8			1.422
Particulate Emissions Tes Pollutant Mass Emission Ra	t Results			Antimony (Sb) T Poliutant Mass Er		DATD
	Fäterable	Condensible	Total	Pontan Mass El	Nn (vg)	11.580883
Ma (ma Ma (a					Mn (ma) Mn (a)	Constant Sector
Mn (g) =	0	0	0		Mn (g) =	0
PMR (lbs/hr) =	0.000	0.000	0.00000	P	MR (ibs/hr) =	0.000
Concentration, gr/dscf				Concentration, gr	/dscf	
	0.00000	0.00000	0.00000		pr/dscf =	0.00E+
ar/dscf =		0.00000	0.00000			
Concentration, mg/dcsm				Concentration, m	g/dcsm	
	0.00000	0.00000	0.00000	Concentration, m		0.00
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission	0.00000			Antimony (Sb) E	g/dcsm ma/dscm = imission Rai	
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (B/hr) (0.00000 Rate, Throughput Based			Antimony (Sb) E Throughput Bas	gʻdesm ma'dsem = Emission Rat red	te
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission	0.00000	0.00000	0.00000	Antimony (Sb) E Throughout Bas Production Production	g/dcsm mq/dscm = Emission Rat eed (1b/hr) = (1or/hr) ≈	te 0 0
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (los/hr) =	0.00000 Rate, Throughput Based 0 Filterable	0.00000 Condensible	0.00000	Antimony (Sb) E Throughput Bas Production Production Production	gʻdcsm mqʻdscm = (mission Rat (ib/hr) = (ib/hr) = (ion/hr) =	
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission Production (lib/hr) = Production (libr/hr) =	0.00000 Rate, Throughput Based 0 Filterable \$DV/0!	0.00000	0.00000	Antimony (Sb) E Throughput Bas Production Production (Production (PMR (b)	g/dcsm mq/dscm = (mission Rai (b/hr) = (b/hr) = (b/hr) = (b/hr) = sion(hr) = sion)	te 0 0
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (los/hr) =	0.00000	0.00000 Condensible #DIV/0!	0.00000	Antimony (Sb) E Throughout Bas Production Production (Production (PMR (Ib Beryllium (Be) T	g/dcsm mg/dscm = (mission Rai (ib/hr) = (ib/hr) = (ion/hr) = ston) est Results	0 0 0 #DIV/C
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0.00000 Rate, Throughput Based 0 Filterable \$DV/0!	0.00000 <u>Condensible</u> #DN/01 R Mn (ug)	0.00000 Total #DN/01	Antimony (Sb) E Throughput Bas Production Production (Production (PMR (b)	g/dcsm mg/dscm = imission Rai (ib/hr) = (ion/hr) = ion/hr) = ston) est Results Mn (ug	te 0 0 #DIVA
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0.00000	0.00000 Condensible #DIV/0! R Mn (ug) Mn (ug)	Total #DN/01	Antimony (Sb) E Throughout Bas Production Production (Production (PMR (Ib Beryllium (Be) T	g/dcsm ma/dscm = imission Rat ied (ib/hr) = (ion/hr) = ion/hr) = ston) est Results mission Rate Mn (ug Mn (ma	e 0 0 #DIVA
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0.00000	0.00000 <u>Condensible</u> #DN/01 R Mn (ug)	Total #DN/01	Antimony (Sb) E Throughput Bas Production Production I Production I PMR (b Beryllium (Be) T Poliutant Mass E	g/dcsm mg/dscm = (mission Rai (ib/hr) = (ib/hr) = (ib/hr) = ston) est Results Mn (ug Mn (ug Mn (g) =	0 0 #DIV/C
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0.00000 Rate, Throughput Based 0 Fittrable 	0.00000 Condensible #DIV/0! R Mn (ug) Mn (ug) Mn (n)	Total #DiV.01	Antimony (Sb) E Throughput Bas Production Production I Production I PMR (b Beryllium (Be) T Poliutant Mass E	g/dcsm ma/dscm = imission Rat (ib/hr) = (ion/hr) = ion/hr) = isston) est Results mission Rate Mn (rug Mn (ma Mn (rug	0 0 #DIV/C
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0.00000 Rate, Throughput Based Piterable Batturn (Ba) Test Results Pollutant Mass Emission Rate, PM	0.00000 <u>Condensible</u> #DIV/0! R Mn (u ₂) Mn (g) =	Total #DiV.01	Antimony (Sb) E Throughout Bas Production Production Production PMR (tb Beryllium (Be) T Poliutant Mass E	g/dcsm ma/dscm = imission Rai (ib/hr) = ibor/hr) = jon/hr) = isston) est Results Mn (up Mn (up Mn (ma Mn (g) = HRR (ibs/hr) *	0 0 #DIV/C
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0.00000 Rate, Throughput Based 0 Fittrable 	0.00000 <u>#DN/0!</u> R Mn (ug) Mn (g) = PMR (lbs/hr) =	Total #DiV.01	Antimony (Sb) E Throughput Bas Production Production I Production I Physic (b Beryllium (Be) T Poliutant Mass E	g/dcsm ma/dscm = imission Rai (ib/hr) = ibor/hr) = jon/hr) = isston) est Results Mn (up Mn (up Mn (ma Mn (g) = HRR (ibs/hr) *	e 0 0 #DIVA #DIVA
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	Barturn (Ba) Test Results Polyton Rassed Bolturn (Ba) Test Results Polyton Rasses Concentration, gridscf	0.00000 <u>#DN/0!</u> R Mn (ug) Mn (g) = PMR (lbs/hr) =	0 00000 Total \$DN/01	Antumony (Sb) E Throughout Bas Production Production Production PMR (b) Bervillum (Be) T Pollutant Mass E F Concentration, gi	g/dcsm mg/dscm = imission Rai (lohi) = jonhi) = ionhi) = stResults mission Rate Mn (ug Mn (ma Mn (a) = MR (loshi) = idscf g/dscf =	e 0 0 #DIVA #DIVA
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0.00000 Rate, Throughput Based Piterable Batturn (Ba) Test Results Pollutant Mass Emission Rate, PM	0.00000 <u>#DN/0!</u> R Mn (ug) Mn (g) = PMR (lbs/ht) =	0.00000 Total #DAV.01 0 0.0000 0.0000 0.0000	Antimony (Sb) E Throughout Bas Production Production Production PMR (tb Beryllium (Be) T Poliutant Mass E	g/dcsm mg/dscm = imission Rai (lohi) = jonhi) = ionhi) = stResults mission Rate Mn (ug Mn (ma Mn (a) = MR (loshi) = idscf g/dscf =	0 0 #DIVA #DIVA 0 0.000E+
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0 00000 Tate, Throughput Based 0 Fiterable #DVK0 Bartum (Ba) Test Results Poliutant Nass Emission Rate, PM Concentration, gridscf Concentration, mg/dcsm	0.00000 <u>Condensible</u> <u>BDV/0!</u> <u>Mn (up)</u> <u>Mn (up)</u> <u>Mn (up)</u> <u>Mn (up)</u> <u>ar/dscf =</u>	0 00000 Total BDN/01 0 0.000 0.000 0.000 0.000	Antimony (Sb) E Throuchout Bat Production Production PMR (b) Bervilium (Be) T Poliutani Mass E F Concentration, m	g/dcsm ma/dscm = imission Rai ied (brhh) = (brhh) = tonhr) = ston) est Results Mn (ig Mn (in Mn (ig Mn (issin) Rate Mn (ig Mn (in Mn (ig Mn (issin) - ission Rate Mn (ig Mn (ig M	te 0 #DIV/d #DIV/d 0 0.000 0.000 0.000
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	0 00000 0 0 0 Fiterable SOV(0) Bartum (Ba) Test Results Polytant Nass Emission Rate, PM Concentration, gridscf Concentration, mg/dcsin Bartum (Ba) Emission Rate Throughput Based	0.00000 Condensible #DIV/0! R Mn (up) Mn (in) Mn (in) PMR (ibs/hr) = ar/dscf = ma/dscm =	0 00000 Fotal #DN/01 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Antimony (Sb) E Throuchout Bat Production Production PMR (Be) T Poliutani Mass E F Concentration, g Concentration, g Concentration, g Beryllium (Be) E	g/dcsm ma/dscm = fmission Rai (cht) = (ton/h) = ton/h) = ston) =stron) =stron Mn (ton Mn (ton Mn (ton Mn (ton Mn (ton Mn (tos) = MR (tos/h) = /dscf ar/dscf ar/dscf ma/dscm = imission Raise ed	e 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	Concentration, mg/dstr Concentration, mg/dstr Concentration, mg/dstr Datum (Ba) Emission Rate Politant Mass Emission Rate, PM Concentration, mg/dstr Concentration, mg/dstr Datum (Ba) Emission Rate Throughput Based	0.00000 Condensible \$DXV0! R Mn (ug) Mn (ug) Mn (g) = PHR (bscht) = ar/dscf = ma/dscm =	0 00000 Fotal \$DN/01 0 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Antimony (Sb) E Throuchout Bas Production Production Production Production Production Poliutant Mass E F Concentration, gr Concentration, gr Concentration, gr Berytlium (Be) E Throuchout Bas Production	g/dcsm ma/dscm = (lb/hr) = (lb/hr) = lon/hr) = lon/hr) = lon/hr) = shon = shon shon shon shon shon shon shon shon	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	Concentration, mg/ds:n Concentration, gr/ds:f Concentration, gr/ds:f Concentration, gr/ds:f Concentration, mg/ds:sn Bartum (Ba) Entestion Rate Throughput Based Throughput Based Throughput Based Throughput Based	Condensible #DIV/0! R Mn (up) MA (by fired PMR (by fired ar/dscf = ma/dscf =	0.00000 Total #00001 0	Antimony (Sb) E Throughout Bar Production Production Production Production Production Production F Concentration, gr Concentration, gr Concentration, gr Concentration, gr Concentration, gr Concentration, gr Concentration, gr Production Production	g/dcsm ma/dscm = (lb/hr) = (lb/hr) = lon/hr) = lon/hr) = lon/hr) = shor) = shor) = mission Rais Mn (in Mn (in)Mn (in Mn (in Mn (in Mn (in)Mn (in Mn (in Mn (in)Mn (in Mn (in Mn (in Mn (in)Mn (in)Mn (in Mn (in)Mn (Le 0 0 0 0 0 0 0 0 0 0 0 0 0
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Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	Concentration, mg/ds:n Concentration, gr/ds:f Concentration, gr/ds:f Concentration, gr/ds:f Concentration, mg/ds:sn Bartum (Ba) Entestion Rate Throughput Based Throughput Based Throughput Based Throughput Based	Condensible sDN/0: R Mn (up) Mn (in) PMR (bs/hr) = ar/dscf = ma/dscf =	0.00000 Jotal 9.00/01 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Antimony (Sb) E Throughout Bar Production Production Production Production Production Production F Concentration, gr Concentration, gr Concentration, gr Concentration, gr Concentration, gr Concentration, gr Concentration, gr Production Production	gʻdosm ma'dsom = imlaslon Rai ked (libhi) = tionhi) = tionhi) = ston) est Results mission Rate Ma (ug Ma' (ma Ma' (na Ma' (ug) = Ma (ug) = Ma (ug) = Ma (ug) = ma'dsom = imlaslon Rai ked (libhi) = tionhi) = tionhi) = tionhi) = tionhi = tionhi= tio	e 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (lor/hr) =	Occord Occord O O O O O O Fiterable SOV(0) Bartum (Ba) Test Results Polutant Nass Emission Rate Concentration, gridscf Concentration, mg/dcsin Bartum (Ba) Emission Rate Production (torh)) Production (torh)) Production (torh) Production (torh) Production (torh) Polutant Mass Emission Rate	Condensible #DXV0(BX (real) MA (c) = PH/R (bs/hr) = ar/dscf = ma/dscm =	0 00000 Total 20000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 000000 000000 000000 0000000 000000000	Antimony (Sb) [E Throughout Bar Production Production Production Production Production Production Concentration, pr Concentration, pr Production Productio	gidsom madstore imission Rat et (bhp) = (bhp)	e 0 0 0 0 0 0 0 0 0 0 0 0 0
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (los/hr) =	Concentration, gridscf Concentration, gridscf Concentration, gridscf Concentration, gridscf Concentration, gridscf Concentration, mg/dcsm Barlum (Ba) Emilssion Rate Throughput Based Production (lor/h) Production (lor/h)	Condensible SDNV0: SDNV0: Mn (up) Mn (c) = maidscm = aridscf = maidscm = s = aridscf = Mn (uc) Mn (c) = PMR (bshu) =	0.00000 Total 2.50x/01 0.000	Antimony (5b) E Thrioshnut Ba Production Production Production Production Production Production Production Concentration, gr Concentration, gr Concentration, gr Concentration, gr Production Productio Production Production Production Production Productio	geldesm machigene Hindiston Rah Herd (Ghrb) = est Resulte Honhy = est Resulte Min (in chrb) = Herd Min (in chrb) = Herd Min (in chrb) = Min (in chrb) = Herd (in chr	0 0 9 0 9 0 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (los/hr) =	Concentration, gridsof Concentration, gridsof Concentration, ardisef Concentration, gridsof Concentration, mgidesm Concentration, mgidesm	Condensible #DXV0(BX (real) MA (c) = PH/R (bs/hr) = ar/dscf = ma/dscm =	0.00000 Total 2.50x/01 0.000	Antimony (Sb) E Throughout Ear Production Production Production Production Production Production Concentration, or Production Productio Production Production Production Product	geldsm maddem imalslan Rab ed (bh) a est Results bab) bab) mathematical mathematica	0 0 9 0 9 0 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Concentration, mg/dcsm mg/dscm = Pollutant Mass Emission (Production (lls/hr) = Production (los/hr) =	0 00000 G G G G G Fiterable G Fiterable Fiterable FOUNCE	Condensible SDNV0: SDNV0: Mn (up) Mn (c) = maidscm = aridscf = maidscm = s = aridscf = Mn (uc) Mn (c) = PMR (bshu) =	0.00000 Total 2.50x/01 0.000	Antimony (5) [3 Thioshind Ba Production Production Production Production Production Production Production Concentration, p Concentration, p Production Pr	geldesm madbare innisision Rate ded (bht) = (bht) (bht	0 0 9 0 9 0 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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0 000000000000000000000000000000000000		Polituant Mass Emission 8 Mn (up) Mn (up) Mn (un) Mn (u) PMR (bshn) = Concentration, gridsct Concentration, gridsct Concentration, mg/dscm md/scm Cadmium (cO) Emission Throuchout Based Production (bh) = Production (bh) = Production (bh) Production (bh) Production (bh) Production (bh) Concentration, ard/scf Concentration, md/scm Mn (u) Mn (a) Production (bh) Production (bh) Philant Mass Emission 8 Concentration, md/scm Concentration, md/scm Production (bh) Production (bh) Pr	abo, PMR 0<	
0 0.00E+00 0.00E+00 0.00E+00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Pollutant Mass Emission R Mn (ug) Mn (ug) PMR (bshn) = Concentration, gridscf Concentration, gridscf Concentration, mg'dscm ma*dscm = Cadmium (CG) Emission Throuchout Based Production (bhn) = Production (bhn) = Production (chn) = PRR (bshn) = Concentration, ma*dscm ma*dscm = Production (chn) = PRR (bshn) = Production (chn) = PRR (bshn) = Production (chn) = PRR (bshn) = Production (chn) = PRR (bshn) = Production (chn) = Producti	abo, PAR 0 0 0 0 </td <td></td>	
0 0000E+00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Polituant Mass Emission P Mn (up) Mn (up) Mn (up) Mn (up) PVR (bb/n) = Concentration, qr/dscf Concentration, qr/dscf Concentration, qr/dscf Concentration, qr/dscf Production (bh/p) = Production (bh/p) Production (bh/p) PMR (bb/n) Concentration, qr/dscf Concentration, qr/dscf Co	ate, PKR 0 0 0 0 0 0 0 0 0 0 0 0 0	
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0 000E+00 0 000E+00 0 000E+00 0 000 0 000 0 000E+00 0 000E+000 0 000E+000 0 000E		Polituant Mass Emission 8 Mn (up) Mn (up) Mn (up) Mn (up) Mn (up) Mn (up) PMR (upshn) = Concentration, gridset Concentration, gridset Cadmium (CG) Emission Throughout Based Production (Ehn) = Production (Ehn) = Production (Ehn) = Production (Ehn) = Production (Ehn) = Mn (up) Mn (up) Mn (up) Mn (up) Mn (up) Mn (up) PMR (behn) Concentration, arkiset Concentration, arkiset Production (Ehn) = Production (Ehn) = P	ate, PKR 0 0 0 0 0 0 0 0 0 0 0 0 0	
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0 0 0.005 0.005 0.005 0 0 0 0 0 0 0 0 0		Politiant Mass Emission F Mn (up) Mn (up) Mn (up) Mn (up) PMR (bkn) Concentration, qr/dscl Concentration, qr/dscl Concentration, qr/dscl Concentration, qr/dscl Production (bhn) Production (bhn) Production (bhn) Production (bhn) Production (bhn) Production (bhn) PhR (bkn) Concentration, qr/dscl Concentration, qr/dscl Concentration, qr/dscl Production (bhn) Production	ate, PMR 0 0 0 0 0 0 0 0 0 0 0 0 0	
0 0 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000		Polituant Mass Emission Vin (up) Min (up) Min (up) Min (up) PVR (bshn) = Concentration, gridsct Concentration, gridsct Concentration, mg vicsm mg discm = Cadmium (Cc) Emission Throughout Based Production (bhn) = Production (bhn) = Pr	ate, PKR 0 0 0 0 0 0 0 0 0 0 0 0 0	
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0 0 0 0 0 0 0 0 0 0 0 0 0 0		Pollutant Mass Emission R Mn (ug) Mn (ug) Mn (ug) PMR (bshn) = Concentration, gridscf Concentration, mg/dscm ma/dscm = Cadmium (CG) Emission Throuchout Based Production (bhn) = Production (bhn) = Production (chn) = PRR (bshn) = Production (chn) = Prod	ate, PAR 0 0 0 0 0 0 0 0 0 0 0 0 0	

SOURCE: UNIT TESTED: HRO	Cokenergy, LLC CC with Waste Heat Bollers Environmental Corporation		
DATE OF TEST:	June 9, 2021 1-4, 29		
METHODS:			
Average Stack Temperature, Ts			269.611
Average Stack Gas Velocity, Vs			72.089
Average Stack Gas Flowrate, Q			1100666.398
Average Stack Gas Flowrate 🛱			657211.459
Average Stack Gas Flowrate 🛱	STD. COND., Dry Basis, Ostd (o		39432687,56
Average % Isokinetic, %I		Pass	101.093
Average % isokinetic measured	from Intermediate values, %I	Pass	101,155
Average Post Test Cal (2-run)		Pass	0.98
Average Post Test Cal (3-run)		Pass	0.98
Average Pollutant Mass Emissi	PM Only on Rate, PMR, Ibs/hr		0.00
Average Concentration, gr/dsci			0.000
Average Concentration, molds			0.000
Average Pollutant Mass Emissi			#D/V/0!
Contain mass Ellissi	PM10 (Filterable + Conden	sible)	•0.•/0:
Average Pollulant Mass Emissi	on Rate, PMR, Ibs/hr		0.00
Average Concentration, gr/dsci			0.00
Average Concentration, mg/ds	-m		0.00
Average Pollutant Mass Emissi	on Rate. PMR, Ibs/ton		#DrV/01
Average Production Rate, Ib/hr			
Average Production Rate, ton/	nr		
Opacity (highest 6-min average			
Average Opacity			
Antimony/Shi lb/br			1 0.00
Antimony (Sb), Ib/hr Antimony (Sb) Ib/ton			0.00 #DIV/0!
Antimony (Sb) lbton Antimony (Sb) gr/dscf Arsenic (As), lb/hr			#DIV/0! 0.00E+0 0.00
Antimony (Sb) Ibiton Antimony (Sb) gridscf Arsenic (As), Ibitr Arsenic (As) Ibiton Arsenic (As) gridscf			#DIV/0! 0.00E+0 0.00 #DIV/0! 0.00E+0
Antimony (Sb) Ibiton Antimony (Sb) gridscf Arsenic (As), Ibitr Arsenic (As) Ibiton Arsenic (As) gridscf Barlum (Ba), Ibitr			#DIV/0! 0.00E+0 0.00 #DIV/0! 0.00E+0 0.00E+0
Antimony (Sb) Bixton Antimony (Sb) gridscf Arsenic (As), Ib/hr Arsenic (As) Ib/hr Arsenic (As) gridscf Barlum (Ba), Ib/hr Barlum (Ba) Ib/hon Barlum (Ba) gridscf			#DIV/0! 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0
Antimony (Sb) lakton Antimony (Sb) gridsacf Arsenic (As), lø/hr Arsenic (As) lø/hr Arsenic (As) gridsacf Barlum (Ba), gridsacf Barlum (Ba), lø/hr Barlum (Ba) gridsacf Bervilium (Be), lø/hr Bervilium (Be) lø/hr			#DIV/0! 0.00E+0 0.00E 0.00E+000E+0
Antimony (Sb) lation Antimony (Sb) gridscf Arsenic (As), lbAn Arsenic (As), lbAn Arsenic (As) lbAn Barlum (Ba), gridscf Barlum (Ba) lbAn Barlum (Ba) gridscf Barlum (Ba) gridscf Berrillium (Be), lbAn Berrillium (Be) gridscf			#DIV/0! 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0
Antimory (Sb) Ibiton Antimory (Sb) gridsc1 Arsenic (As), Ibiton Arsenic (As) Ibiton Arsenic (As) gridsc1 Barlum (Ba), Ibiton Barlum (Ba) Ibiton Barlum (Ba) gridsc1 Beryllium (Ba) Ibiton Beryllium (Ba) gridsc1 Cadmium (Cd), Ibiton			#DIV/0! 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0
Antimory (3b) Ibiton Antimory (3b) Igidact Arsenic (As), Ibitr Arsenic (As), Ibitr Arsenic (As), Ibitr Barlum (Ba), Ibitr Barlum (Ba), Ibitr Barlum (Ba), Ibitr Barlum (Ba), Ibitr Barlum (Ba), Ibitr Barlum (Ba), Ibitr Cadmium (Cal), Ibitr Cadmium (Cal), Ibitr Cadmium (Cal), Ibitr			#DN/09 0.00E+00 9.00E+00 9.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
Antimory (3b) Judion Artenic (As), Ibhr Artenic (As), Ibhr Artenic (As) Judion Artenic (As) gridscf Bahrun (Ba), Ibhr Bahrun (Ba), Ibhr Bahrun (Ba), Ibhr Bahrun (Ba), Ibhr Bahrun (Ba), Ibhr Bahrun (Ba), Ibhr Bahrun (Ba), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Chomhum (Ga), Ibhr			#DV/0! 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0
Antimory (Sb) Jisford Artenic (Ab), Ibhr Artenic (Ab), Ibhr Artenic (Ab), Ibhr Artenic (Ab), Ibhr Artenic (Ab), Ibhr Barlum (Bb), Ibhr Barlum (Bb), Ibhr Barlum (Bb), Ibhr Barlum (Bb), Ibhr Barlum (Bb), Ibhr Barlum (Bb), Ibhr Cadmium (Cd), Ibhr Cadmium (Cd), Ibhr Cadmium (Cd), Ibhr Cadmium (Cd), Ibhr Cadmium (Cd), Ibhr Cambum (Cd), Ibhr Chaomhum (Cd), Ibhr			#DV/0! 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0
Antimory (3b) Inform Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Barlum (Ba) arthon Barlum (Ba) grifstef Barlum (Ba) grifstef Barlum (Ba) grifstef Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Cadmium (Ga), Ibhr Chamlum (Ga), Ibhr Chamlum (Ga), Ibhr Chamlum (Ga), Ibhr Chable (Ga), Ibhr Cobalt (Ga), Ibhr			#DN/0! 0.00E+0 0.00
Antimory (3b) Inforn Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa) Ibhr Artenic (Aa) Ibhr Artenic (Aa) Idhf Artenic (Aa) Idhf Artenic (Aa) Idhf Barlum (Ba) Ibhr Barlum (Ba) Ibhr Barlum (Ba) Ibhr Berrillum (Ba) Ibhr Berrillum (Ba) Ibhr Berrillum (Ba) Ibhr Cadhium (Ca) Ibhr Cadhium (Ca) Ibhr Cadhium (Ca) Ibhr Chemhum (Ca), Ibhr			#DN/0! 0.00E+0 9DN/0! 0.00E+00
Antimory (3b) Inform Artenic (Aa) Infor Artenic (Aa) Infor Artenic (Aa) Inform Artenic (Aa) Inform Barlum (Ba) Inform Cadmium (Ga) Inform Cadmium (Ga) Inform Cadmium (Ga) Inform Cadmium (Ga) Inform Chambur (Ga) I			#DN/dl 0.00E+0 0.00
Antimory (3b) Inform Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Barlum (1a), Ibhr Barlum (1a), Ibhr Barlum (1a), Ibhr Barlum (1a), Ibhr Barlum (1a), Ibhr Benriftum (1a), Ibhr Benriftum (1a), Ibhr Benriftum (1a), Ibhr Benriftum (1a), Ibhr Benriftum (1a), Ibhr Cadmium (1a), Ibhr Cadmium (1a), Ibhr Chomlum (1a), Ibhr Chomlum (1a), Ibhr Chomlum (1a), Ibhr Chomlum (1a), Ibhr Cobalt (1ca), Ibhr Gobalt (1ca), Ibhr Gobalt (1ca), Ibhr			#DN/d: 0.00E+0
Antimory (3b) Inform Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Artenic (Aa), Ibhr Barlum (Ba) grifset Barlum (Ba) grifset Barlum (Ba) grifset Cadmium (Ca), Ibhr Barlum (Ba) grifset Cadmium (Ca), Ibhr Cadmium (Ca), Ibhr Caball (Ca), Ibhr Coball (Ca), Ibhr Coball (Ca), Ibhr Coball (Ca), Ibhr Coball (Ca), Ibhr Copper (Cu), Ibhr Copper (Cu), Ibhr Cadpit (Cu), Ibhr Cadpit (Ca), Ibhr Cadpit (Cu), Ibhr Caball (Ca), Ibhr Capper (Cu), Ibhr Cadpit (Cu), Ibhr Ca			#DN/0! #DN/0! 0.00E+0 0.00E
Antimory (3b) Inform Artenic (3b) Inform Artenic (3b) Inform Artenic (Ab) Bhy Artenic (Ab) Bhy Artenic (Ab) Bhy Artenic (Ab) Bhy Barlum (Ba) Inform Barlum (Ba) Inform Barlum (Ba) Inform Barlum (Ba) Inform Cardinum (Cd) Inform Cardinum (Cd) Inform Cardinum (Cd) Inform Cardinum (Cd) Inform Cardinum (Cd) Inform Chemelum (Cd)			#DN/d: 0.00E+0
Antimory (Sb) Infrom Artenic (As), Ibhr Artenic (As), Ibhr Artenic (As), Ibhr Artenic (As), Ibhr Barlum (Ba), Ibhr Cadmium (Ca), Ibhr Cadmium (Ca), Ibhr Chromhum (Ca), Ibhr Manganese (Ma), Jirken			#DN/d! 0.00E+0 0.00
Antimory (3b) Inform Antimory (3b) Inform Arenic (Aa), Infor Arenic (Aa), Infor Arenic (Aa), Infor Arenic (Aa), Inform Arenic (Aa), Inform Arenic (Aa), Inform Britishing (1b), Inform Britishing (1b), Inform Bendlium (1b), Inform Bendlium (1b), Inform Bendlium (1c), Inform Cadmium (1c), Inform Cadmium (1c), Inform Cadmium (1c), Inform Cadmium (1c), Inform Chamlum (1c), Inform Manganum (1c), Inform Manganum (1c), Inform			#DN/dl 0.00E+0
Antimory (Sb) Inform Antennov (Sb) Inform Antennov (Sb) Inform Antennov (Sb) Inform Antennov (Sb) Inform Antennov (Sb) Inform Barlum (Ba) Inform Barlum (Ba) Inform Barlum (Ba) Inform Barlum (Ba) Inform Barlum (Ba) Inform Cardinum (Cd) Inform Manganzes (Mo) guidect Manganzes (Mo) guide			#DN/el #DN/el 0.00E+0
Antimory (Sb) Inform Artenic (Sb) Inform Artenic (Sb) Inform Artenic (Ab) Bhy Artenic (Ab) Bhy Artenic (Ab) Bhy Artenic (Ab) Bhy Barlum (Ba) Bhon Barlum (Ba) Bhon Barlum (Ba) Bhon Barlum (Ba) Bhon Gardium (Sc) Inform Cardinum (Sc) Inform Cardinum (Sc) Inform Cardinum (Sc) Inform Cardinum (Sc) Inform Chemhum (Sc) Inform Chemh			#EN/Vel #EN/Vel 0.00E+0 0.00E 0.00E+0 0.00E 0.00E+0 0.00E 0.00E+0 0.00E 0.00E+0 0.00E 0.00E+0 0.00E 0.00E+0 0.00E+0
Antimory (Sb) Infran Artenior (Sb) Infrance Artenior (Sb) Infrance Artenior (Sb) Infrance Barlum (Ba) Infrance Cardinum (Cd) Infrance Cardinum (Cd) Infrance Cardinum (Cd) Infrance Chromolum (Cd) Infrance Infrances (Mc) griftest Theorem (Fd) Infrance Honganese (Mc) griftest Theorem (Fd) Infrance Honstonum (Fd) Infrance Phosenborus (Fd) Infr			#DN/el #DN/el 0.00E/0 0.00E/0 0.00E/0 <td< td=""></td<>
Antimory (Sb) Inform Anteniory (Sb) Inform Assence (Aa), Bohr Assence (Aa) Grifser Assence (Aa) Grifser Barlum (Ba) Rohr Barlum (Ba) grifset Barlum (Ba) grifset Barlum (Ba) grifset Barlum (Ba) grifset Cardinum (Cd) Inform Cardinum (Cd) Info			#ENV/0! 0.00E+0 0.00E+0 <td< td=""></td<>
Antimory (Sb) Inform Antennov (Sb) Inform Antennov (Sb) Inform Antennov (Sb) Inform Antennov (Sb) Inform Antennov (Sb) Inform Barlum (Ba) Inform Barlum (Ba) Inform Barlum (Ba) Inform Barlum (Ba) Inform Barlum (Ba) Inform Cardinum (Cd) Infor			#DN/el #DN/el 0.054:0 0.054:0 0.05 0.051:0 0.05 0.051:0 0.05 0.052:0 0.05 0.052:0 0.05 0.052:0 0.05 0.052:0 0.05 0.052:0 0.05 0.052:0 0.05 0.052:0 0.05 0.052:0 0.05 0.052:0 0.05 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052 0.052:0 0.052
Antimory (Sb) Infrom Artenico (Sb) Infrom Artenico (Sb) Infrom Artenico (Sb) Infrom Artenico (Sb) Infrom Barlum (Ba) Infrom Cambinum (Ca) Infrom Cambinum (Ca) Infrom Cambinum (Ca) Infrom Chembinum (Ca) Infrom Manganese (Ma) Infrom Manganese (Ma) Infrom Herceury (Ha) Infrom			#DN/el #DN/el 0.00E/c0 0.
Antimory (Sb) Jinford Artenic (Aa), Bhr Artenic (Aa), Bhr Artenic (Aa), Bhr Artenic (Aa), Bhr Barlum (Ba), Bhr Barlum (Ca), Bhr Cadmium (Ca), Mar Cadmium (Ca), Mar Cadmium (Ca), Mar Cadmium (Ca), Mar Cadmium (Ca), Mar Cadmium (Ca), Mar Cadmium (Ca), Mar Chomlum (Ch), Bhr Chomlum (Ch), Bhr Chomlum (Ch), Bhr Chomlum (Ch), Bhr Cobalt (Ca), Bhr Cobalt (Ca), Bhr Cobalt (Ca), Bhr Cobalt (Ca), Bhr Cobalt (Ca), Bhr Cobalt (Ca), Bhr Cabalt (Ca), Bhr Cabalt (Ca), Bhr Mananares (Ma), Bhr Measura (P), Bhr Hicket (Mb, Bhr Micket (Mb, Bhr			#D/Wei #D/Wei 0.00E+000 0.00E+0000 0.00E+0000 0.00E+0000 0.00E+0000 0.00E+0000 0.00E+00000 0.00E+00000 0.00E+000000000000000000000000000000000
Antimory (Sb) Jinford Attention (Sb) Jinford Attention (Sb) Jinford Attention (Sb) Jinford Attention (Sb) Jinford Barlum (Ba) Jinford Barlum (Ba) Jinford Barlum (Ba) Jinford Barlum (Ba) Jinford Barlum (Ba) Jinford Cardhium (Cd) Jinford Cardhi			#DN/el #DN/el 0.00E+0 0
Antimory (Sb) Index Attention (Sb) Index Attention (Sb) Index Attention (Sb) Index Barlum (Ba) Index Cadmium (Ga) Index Cadmium (Ga) Index Cadmium (Ga) Index Cadmium (Ga) Index Cadmium (Ga) Index Chernelum (Ga) Index Chern			#DN/el #DN/el 0.00E/c0 0.00E/c0
Antimory (Sb) Jinford Attention (Sb) Jinford Attention (Sb) Jinford Attention (Sb) Jinford Attention (Sb) Jinford Barlum (Ba) Jinford Barlum (Ba) Jinford Barlum (Ba) Jinford Barlum (Ba) Jinford Barlum (Ba) Jinford Cardhium (Cd) Jinford Cardhi			#DN/el: #DN/el: 0.00E+C 0.0

SOURCE:	Cokenergy, LLC
UNIT TESTED:	HRCC with Waste Heat Boilers
TESTING COMPANY:	TRC Environmental Corporation
METHOD:	3A
DATE OF TEST:	June 9, 2021

DATE OF TEST.	Julie 9, 2021							4.434	13.302	
							Ana	alyzer Calibratic	n Error Check	ACE)
		O2 Referer	nce Method Ana	alyzer			Li	inearity Check (N	Aust be within 2.	0%)
	Sampling System Bias Check and	Measured Va	alue Correction					'Low'	'Ups	cale'
								Low-Level	Mid-Level	High-Level
	O2 RM Monitor Span =	22.17	%	Drift Ass	sessment			Gas	Gas	Gas
				Must be wit	thin 3.0%		Serial #	CC126284	CC432856	CC346448
	(Cavg)	(Co)i	(Co)f	Low Gas	Low-Drift		Tag (Cv)	0.00	10.19	22.17
Run	Ave. Measured	Initial	Final	Drift	Pass/Fail		Monitor (Cdir)	0.09	10.29	22.28
No.	Raw (%)	Low Gas	Low Gas	(Eq 7E-4)			Diff. (Cdir-Cv)	0.09	0.10	0.11
1	12.02	0.17	0.19	0.09%	Pass		ACE (Eq 7E-1) 0.41%	0.45%	0.50%
2	12.41	0.19	0.19	0.00%	Pass			Pass	Pass	Pass
3	12.68	0.19	0.17	0.09%	Pass					
						S	ystem Bias (SI	3) Low-Level Ga	s (Must be within	ר 5.0%)
			Drift Asse	essment						
	(Cm)i	(Cm)f	Must be wi	thin 3.0%	1	Run	Low	Final Low	Low Gas	Low-Bias
	Initial	Final	Upscale Gas	Up-Drift		No.	Linearity	Gas	SB	Pass/Fail
Run	Upscale	Upscale	Drift	Pass/Fail			Gas (Cdir)	Bias (Cs)	(Eq 7E-2)	
No.		•	(Eq 7E-4)			Initial	0.09	0.17	0.36%	Pass
1	10.24	10.26	0.09%	Pass		1	0.09	0.19	0.45%	Pass
2	10.26	10.26	0.00%	Pass		2	0.09	0.19	0.45%	Pass
3	10.26	10.24	0.09%	Pass		3	0.09	0.17	0.36%	Pass
										
	(Cma)		(Cgas)				System Bias (S	B) Upscale Gas	(Must be within	5.0 %)
	Upscale	Percent	Corrected	Corrected						
Run	Calibration Gas	Moisture	Dry Basis	Wet Basis			Upscale	Final Upscale	Upscale Gas	Upscale-Bias
No.	%	(%)	(%)	(%)			Linearity	Gas	SB	Pass/Fail
1	10.19	15.61%	11.98	10.11			Gas (Cdir)	Bias (Cs)	(Eq 7E-2)	
2	10.19	14.77%	12.37	10.54		Initial	10.29	10.24	-0.23%	Pass
3	10.19	14.43%	12.65	10.82		1	10.29	10.26	-0.14%	Pass
						2	10.29	10.26	-0.14%	Pass
	40 CFR 60	Cgas = (Ca	vg - Co) * Cma	/ (Cm - Co)	Eq. 7E-5	3	10.29	10.24	-0.23%	Pass

40 CFR 60 Appendix A-4 Method 7E

where:

Cgas = Average effluent gas concentration adjusted for bias, %

Cavg = Average unadjusted gas concentration indicated data recorder for the test run, % Co = Average of initial and final system cal. bias check responses from the low-level calibraiton gas, % Cm = Average of initial and final system cal. bias check responses for the upscale calibration gas, % Cma = Actual concentration of the upscale calibration gas, %

40-60% of

Span 8.868

13.302

< 20% of Span

0

4.434

SOURCE:	Cokenergy, LLC	2								
UNIT TESTED:	HRCC with Waste Heat Boiler	s						< 20% of	40-60% of	
TESTING COMPANY:	TRC Environmental Corporation	n						Span	Span	
METHOD:	34	1						0	7.136	
DATE OF TEST:	June 9, 202	1						3.568	10.704	
k <u>, , , , , , , , , , , , , , , , , , , </u>		_					Anal	yzer Calibratio	n Error Check (ACE)
		CO2 Refere	ence Method Ana	alyzer			Lin	<i>.</i>	lust be within 2.0	0%)
	Sampling System Bias Check and	i Measured V	alue Correction					'Low'	'Ups	cale'
								Low-Level	Mid-Level	High-Level
	CO2 RM Monitor Span =	= 17.84	%	Drift Ass	essment			Gas	Gas	Gas
				Must be wit	hin 3.0%		Serial #	CC126284	CC432856	CC346448
	(Cavg)	(Co)i	(Co)f	Low Gas	Low-Drift		Tag (Cv)	0.00	8.795	17.84
Run	Ave. Measured	Initial	Final	Drift	Pass/Fail		Monitor (Cdir)	0.04	9.04	17.93
No.	Raw (%)	Low Gas	Low Gas	_ (Eq 7E-4)			Diff. (Cdir-Cv)	0.04	0.24	0.09
1	6.33	0.04	0.05	0.06%	Pass		ACE (Eq 7E-1)		1.37%	0.50%
2	5,87	0.05	0.05	0.00%	Pass			Pass	Pass	Pass
3	5.69	0.05	0.04	0.06%	Pass					
						S	ystem Bias (SB)) Low-Level Ga	s (Must be withir	n 5.0%)
			Drift Asses	sment						
	(Cm)i	(Cm)f	Must be with	in 3.0%		Run	Low	Final Low	Low Gas	Low-Bias
	Initial	Final	Upscale Gas	Up-Drift		No.	Linearity	Gas	SB	Pass/Fail
Run	Upscale	Upscale	Drift	Pass/Fail			Gas (Cdir)	Bias (Cs)	(Eq 7E-2)	
No.			(Eq 7E-4)			Initial	0.04	0.04	0.00%	Pass
1	9.04	8.95	0.50%	Pass		1	0.04	0.05	0.06%	Pass
2	8.95	8.82	0.73%	Pass	1	2	10.04 Star 24	0.05	0.06%	Pass
3	8.82	8.78	0.22%	Pass		3	0.04	0.04	0.00%	Pass
	(Cma)		(Cgas)				System Bias (SE	 B) Upscale Gas 	(Must be within	5.0%)
	Upscale	Percent	Corrected	Corrected						
Run	Calibration Gas	Moisture	Dry Basis	Wet Basis				Final Upscale	Upscale Gas	Upscale-Bias
No.	%	(%)	(%)	(%)			Linearity	Gas	SB	Pass/Fail
1	8.80	15.61%	6.18	5.21			Gas (Cdir)	Bias (Cs)	(Eq 7E-2)	
2	8.80	14.77%	5.79	4.94		Initial	9.04	9.04	0.00%	Pass
3		14.43%	5.67	4.85		1	9.04	8.95	-0.50%	Pass
		_ ·-				2	9.04	8.82	-1.23%	Pass
	40 CFR 60	Cgas = (Ca	vg - Co) * Cma /	(Cm - Co) E	q. 7E-5	3	9.04	8.78	-1.46%	Pass

Appendix A-4 Method 7E

where:

Cgas = Average effluent gas concentration adjusted for bias, % Cavg = Average unadjusted gas concentration indicated data recorder for the test run, % Co = Average of initial and final system cal. bias check responses from the low-level calibraiton gas, % Cm = Average of initial and final system cal. bias check responses for the upscale calibration gas, % Cma = Actual concentration of the upscale calibration gas, %

Singer, Michael T

From:	Ford, Luke <lford@primaryenergy.com></lford@primaryenergy.com>
Sent:	Tuesday, July 27, 2021 8:58 AM
То:	Singer, Michael T
Subject:	RE: Cokenergy, LLC - Compliance Test Report
Attachments:	cokenergy stack test process data.pdf

**** This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. ****

Michael

See attached process data from the Pb test on 6/9/21. Let me know if there are additional questions.

Luke E. Ford Director EH&S **Primary Energy** 3210 Watling St. MC 2-991 East Chicago, IN 46312

Email <u>lford@primaryenergy.com</u> Office (219) 397-4626 Mobile (773) 447-8257



Efficiency is the Best Alternative Energy

From: Singer, Michael T <MTSinger@idem.IN.gov> Sent: Monday, July 26, 2021 8:55 AM To: Ford, Luke <lford@primaryenergy.com> Subject: Cokenergy, LLC - Compliance Test Report

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hello Luke –

I am reviewing the stack test report for the Pb testing that was completed on Stack ID 201 on 6/9/2021. Could you please send me pressure drop data during the test for the baghouse system? If this has already been included in the report, please let me know as I may have overlooked it.

Thanks for your help.



Michael T. Singer Environmental Manager II Office of Air Quality, Compliance Data Section Indiana Department of Environmental Management

Office: (317) 232-8429 • <u>mtsinger@idem.in.gov</u> Cell: (463) 206-1458



IDEM values your feedback. Please take two minutes and complete this brief survey.



.

,

Cokenergy Stack 201						
Lead Emissions Testing						
Process Data						
June 9, 2021						
	Run 1	Run 2	Run 3	Average		
Start Date	6/9/2021	6/9/2021	6/9/2021			
End Data	6/9/2021	6/9/2021	6/9/2021			
Start Time	7:38	9:51	12:00			
End Time	9:23	11:36	13:45			
Boiler FW Flow (KPPH)			segressed vidgislag	statistics and the		
A1	33.51	32.90	31.58	32.67		
A2	37.34	35.42	34.16	35.64		
A3	36.86	35.38	34.23	35.49		
A4	35.76	34.28	34.32	34.79		
B1	33.66	33.58	32.74	33.32		
B2	34.96	32.52	31.48	32.99		
B3	35.07	35.23	34.00	34.77		
B4	39.36	36.42	35.46	37.08		
C1	63.18	61.15	58.29	60.87		
C2	69.78	67.64	64.00	67.14		
C3	62.63	60.91	58.86	60.80		
C4	66.23	65.12	62.70	64.68		
D1	53.97	50.61	49.06	51.21		
D2	76.04	72.24	69.53	72.61		
D3	68.19	66.01	64.29	66.16		
D4	48.98	49.34	48.38	48.90		
Steam From Boilers (KPPH)	782.99	755.79	727.49	755.43		
Baghouse 1 DP in. WC	8.15	8.20	8.17	8.17		
Baghouse 2 DP in. WC	7.89	7.90	7.97	7.92		
Stack O2, %	11.64	12.05	12.33	12.01		
Stack SO2, ppm	207.88	185.66	177.74	190.43		
Stack Opacity, %	1.72	2.00	1.65	1.79		

Duplicate copy o recycled on 7/23 tate of Indiana

JUL 22 2021

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Cokenergy, LLC

3210 Watling Street Mail Code 2-991 East Chicago, Indiana 46312

DeptotEnvironmentalManagement State of Indiana

July 19, 2021

Chief, Environmental Enforcement Section Environment and Natural Resources Division U.S. Department of Justice Box 7611, Ben Franklin Station Washington, DC 20044-7611 Re: DOJ No. 90-5-2-1-08555/1

Compliance Tracker Air Enforcement and Compliance Assurance Branch U.S. Environmental Protection Agency – Region 5 77 West Jackson Blvd. AE-18J Chicago, IL 60604-3590

Including an electronic copy to: <u>R5airenforcement@epa.gov</u>

Phil Perry Indiana Department of Environmental Management Chief, Air Compliance and Enforcement Branch 100 North Senate Avenue MC-61-53, IGCN 1003 Indianapolis, IN 46204-2251

#256968

Air Enforcement Division Director U.S. Environmental Protection Agency Office of Civil Enforcement Air Enforcement Division U.S. Environmental Protection Agency 1200 Pennsylvania Ave, NW Mail Code: 2242A Washington, DC 20460

Susan Tennenbaum U.S. Environmental Protection Agency Region 5 C-14J 77 West Jackson Blvd Chicago, IL 60640

Including an electronic copy to: tennenbaum.susan@epa.gov

Elizabeth A. Zlatos Indiana Department of Environmental Management Office of Legal Counsel 100 North Senate Avenue MC-60-01, IGCN 1307 Indianapolis, IN 46204-2251

Including an electronic copy to: bzlatos@idem.in.gov

Subject: Consent Decree, United States, et al. v. Indiana Harbor Coke Company, et al. Cokenergy, LLC (Part 70 Permit No. T089-41033-00383) Lead Stack Test Results Report – Cokenergy Stack 201

To Whom It May Concern:

In accordance with the Enhanced Monitoring Requirements, Paragraph 22a. and 22b. of the consent decree (18-cv-35), Cokenergy, LLC has completed the second stack test for lead on the Main Stack (Stack 201). The testing was completed on June 9, 2021, by TRC Environmental Corporation. The initial stack testing for lead and VOC was completed over the period of December 4 – December 6, 2019. The initial test and the second test were completed at least 18 months apart in accordance with paragraph 22a.

The lead testing results from the June 9, 2021, testing averaged 0.00202 pound per hour.

If you have any questions regarding this report, please contact me at (219) 397-4626 or email at <a href="https://www.icea.org/licea.org

Cokenergy, LLC Lead Stack Test Report July 19, 2021 Page 2 of 2

I certify under penalty of law that this information was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my directions and my inquiry of the person(s) who manage the system, or the person(s) directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

Luke E. Ford Director EH&S Primary Energy

cc: East Chicago Public Library 2401 E. Columbus Drive East Chicago, Indiana 46312

> East Chicago Public Library 1008 W. Chicago Avenue East Chicago, Indiana 46312

Attachments

File: X://675

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT OFFICE OF AIR MANAGEMENT COMPLIANCE AND ENFORCEMENT SECTION PART 70 OPERATING PERMIT CERTIFICATION

4

Source Name: Cokenergy LLC

Source Address: 3210 Watling Street, MC 2-991, East Chicago, Indiana 46312-1610

Part 70 Permit No.: T089-41033-00383

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this permit.

Please check what document is being certified:

Annual Compliance Certification Letter

Report (specify) Lead Stack Test Report pursuant to CD 18-cv-35

- Notification (specify) _____
- Affidavit (specify)
- Other (specify)

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:	Sett alchesa
Printed Name:	Seth Acheson
Title/Position:	General Manager, Cokenergy, LLC
Phone:	(219) 397-4521
Date:	July 19, 2021



LEAD EMISSIONS COMPLIANCE TEST

Received State of Indiana



DeptofEnvironmentalManagement State of Indiana

Performed At Primary Energy Cokenergy Facility HRCC Stack 201 East Chicago, Indiana

Test Date June 9, 2021

Report No. TRC Environmental Corporation Report 437378 B

Report Submittal Date July 15, 2021

TRC Environmental Corporation 7521 Brush Hill Road Burr Ridge, Illinois 60527 USA

T 312-533-2042 F 312-533-2070



Report Certification

I certify that to the best of my knowledge:

- Testing data and all corresponding information have been checked for accuracy and completeness.
- Sampling and analysis have been conducted in accordance with the approved protocol and applicable reference methods (as applicable).
- All deviations, method modifications, or sampling and analytical anomalies are summarized in the appropriate report narrative(s).

Davi Ferry

Gavin Lewis Project Manager

<u>July 15, 2021</u> Date

TRC was operating in conformance with the requirements of ASTM D7036-04 during this test program.

-p-p

Bruce Randall TRC Emission Testing Technical Director

TRC

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3.0 DISCUSSION OF RESULTS	. 5
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5.0 QUALITY ASSURANCE PROCEDURES	. 8
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TRC

LEAD EMISSIONS COMPLIANCE TEST

1.0 INTRODUCTION

TRC Environmental Corporation (TRC) performed a lead (Pb) emissions compliance test program on the HRCC Stack 201 at the Cokenergy Facility of Primary Energy in East Chicago, Indiana on June 9, 2021. The tests were authorized by and performed for Primary Energy.

Cokenergy LLC, SunCoke Energy, Inc. and Indiana Harbor Coke Company entered into a Consent Decree (18-cv-35) (CD) with the United States and the State of Indiana to resolve alleged Clean Air Act violations. The CD became effective on October 25, 2018. Paragraph 22 of the CD requires stack testing of the Main Stack for lead and VOCs. The CD requires two (2) stack tests for lead and one (1) stack test for volatile organic compound (VOC) within 5 years of the effective date. The test satisfies the second of two lead stack tests. The test program was conducted according to the Indiana Department of Environmental Management (IDEM) Compliance Test Protocol dated April 27, 2021.

Participants					
Test Facility	Primary Energy Cokenergy Facility East Chicago, Indiana	Mr. Luke Ford Director EH&S 219-397-4626 (phone) Iford@primaryenergy.com			
Test Coordinator	Primary Energy 3210 Watling Street East Chicago, Indiana 46312 Permit No. T089-41033-00383	nord@primaryenergy.com			
Air Emissions Testing Body (AETB)	TRC Environmental Corporation 7521 Brush Hill Road Burr Ridge, Illinois 60527	Mr. Benigno Cacao Associate Project Manager 630-280-9068 (phone) 312-533-2070 (fax) bcacao@trccompanies.com			

1.1 Project Contact Information

Rome Rothgeb, Ryan Novosel and Benigno Cacao of TRC conducted the testing. Documentation of the on-site ASTM D7036-04 Qualified Individual(s) (QI) can be located in the appendix to this report. No personnel from the IDEM observed the testing.



2.0 SUMMARY OF RESULTS

The results of this test program are summarized in the table below. Detailed individual run results are presented in Section 6.0. The Cokenergy Title V operating permit does not have a lead emission limit. However, the IHCC permit has a lead emission limit of 0.19 lb/hr. The measured lead emission rate was well within the IHCC limit.

Unit ID	Pollutant T	Measured Emissions	
HRCC Stack 201	Pb	lb/hr	2.02E-03

The table below summarizes the test methods used, as well as the number and duration at the test location:

Unit ID/ Sample Location	Parameter Measured	Test Method(s)	No. of Runs	Run Duration (min)
	Volumetric Flowrate	USEPA 1-4	3	96
HRCC Stack 201	Pb	USEPA 12	3	96
	Carbon dioxide (CO ₂), Oxygen (O ₂)	USEPA 3A	3	96

3.0 DISCUSSION OF RESULTS

No problems were encountered with the testing equipment during the test program. Source operation appeared normal during the entire test program. No changes or problems were encountered that required modification of any procedures presented in the test plan. No adverse test or environmental conditions were encountered during the conduct of this test program. Unit operating data was performed by plant personnel and appended to the report.



4.0 SAMPLING AND ANALYSIS PROCEDURES

All testing, sampling, analytical, and calibration procedures used for this test program were performed in accordance with the methods presented in the following sections. Where applicable, the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods, USEPA 600/R-94/038c, September 1994 was used to supplement procedures.

4.1 Determination of Sample Point Locations by USEPA Method 1

This method is applicable to gas streams flowing in ducts, stacks, and flues and is designed to provide guidance for the selection of sampling ports and traverse points at which sampling for air pollutants will be performed. Sample ports must be located at least two duct diameters downstream and a half a duct diameter upstream from any flow disturbance.

The cross-section of the measurement site was divided into a number of equal areas, and the traverse points were located in the center of each area. The minimum number of points were determined from Figure 1-2 (non-particulate) of the Method.

4.2 Volumetric Flow Rate Determination by USEPA Method 2

This method is applicable for the determination of the average velocity and the volumetric flow rate of a gas stream.

The gas velocity head (ΔP) and temperature were measured at traverse points defined by USEPA Method 1. The velocity head was measured with a Type S (Stausscheibe or reverse type) pitot tube and oil-filled manometer; and the gas temperature was measured with a Type K thermocouple. The average gas velocity in the flue was calculated based on: the gas density (as determined by USEPA Methods 3A and 4); the flue gas pressure; the average of the square roots of the velocity heads at each traverse point, and the average flue gas temperature.

4.3 Determination of the Concentration of Gaseous Pollutants Using a Multi-Pollutant Sampling System

Concentrations of the pollutants in the following sub-sections were determined using one sampling system.

A straight-extractive sampling system was used. A data logger continuously recorded pollutant concentrations and generated one-minute averages of those concentrations.



All calibrations and system checks were conducted using USEPA Protocol gases. Threepoint linearity checks were performed prior to sampling, and in the event of a failing system bias or drift test (and subsequent corrective action). System bias and drift checks were performed using the low-level gas and either the high- or mid-level gas (as specified in the appendices) prior to and following each test run.

The Low Concentration Analyzers (those that routinely operate with a calibration span of less than 20 ppm) used by TRC are ambient-level analyzers. Per Section 3.12 of Method 7E, a Manufacturer's Stability Test is not required for ambient-level analyzers. Analyzer interference tests were conducted in accordance with the regulations in effect at the time that TRC placed an analyzer model in service.

4.3.1 CO₂ Determination by USEPA Method 3A

This method is applicable for the determination of CO_2 concentrations in controlled and uncontrolled emissions from stationary sources only when specified within the regulations. The CO_2 analyzer was equipped with a non-dispersive infrared (IR) detector.

4.3.2 O₂ Determination by USEPA Method 3A

This method is applicable for the determination of O_2 concentrations in controlled and uncontrolled emissions from stationary sources only when specified within the regulations. The O_2 analyzer was equipped with a paramagnetic-based detector.

4.4 Lead Determination by USEPA Method 12

This method is applicable for the determination of inorganic lead (Pb) emissions from stationary sources, only as specified in an applicable subpart of the regulations. USEPA Methods 2-4 were performed concurrently with, and as an integral part of these determinations.

Flue gas was withdrawn isokinetically from the source at traverse points determined per USEPA Method 1. Particle-bound and gaseous Pb were collected in the nozzle, probe liner, filter, and impingers containing a solution of dilute nitric acid. The probe liner and filter were maintained at a temperature of $120\pm14^{\circ}$ C (248 + 25°F). The collected samples were digested and analyzed via atomic absorption spectrophotometry using an air/acetylene flame.



5.0 QUALITY ASSURANCE PROCEDURES

TRC integrates our Quality Management System (QMS) into every aspect of our testing service. We follow the procedures specified in current published versions of the test Method(s) referenced in this report. Any modifications or deviations are specifically identified in the body of the report. We routinely participate in independent, third party audits of our activities, and maintain:

- Accreditation from the Louisiana Environmental Laboratory Accreditation Program (LELAP);
- Accreditation from the Stack Testing Accreditation Council (STAC) and the American Association for Laboratory Accreditation (A2LA) that our operations conform with the requirements of ASTM D 7036 as an Air Emission Testing Body (AETB).

These accreditations demonstrate that our systems for training, equipment maintenance and calibration, document control and project management will fully ensure that project objectives are achieved in a timely and efficient manner with a strict commitment to quality.

All calibrations are performed in accordance with the test Method(s) identified in this report. If a Method allows for more than one calibration approach, or if approved alternatives are available, the calibration documentation in the appendices specifies which approach was used. All measurement devices are calibrated or verified at set intervals against standards traceable to the National Institute of Standards and Technology (NIST). NIST traceability information is available upon request.

ASTM D7036-04 specifies that: "AETBs shall have and shall apply procedures for estimating the uncertainty of measurement. Conformance with this section may be demonstrated by the use of approved test protocols for all tests. When such protocols are used, reference shall be made to published literature, when available, where estimates of uncertainty for test methods may be found." TRC conforms with this section by using approved test protocols for all tests.



6.0 TEST RESULTS SUMMARY

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Method 12 Metals Test Results Summary **Primary Energy** Company: Cokenergy Facility Plant: HRCC Unit: Stack 201 Location: Run No: 1 2 3 Average Date: 6/9/2021 6/9/2021 6/9/2021 12:00 Start Time: 7:38 9:51 End Time: 9:23 11:36 13:45 Run Duration (min): 96.0 96.0 96.0 Fixed Gas Content: CO₂ (% vol) 6.2 5.8 5.7 5.9 12.0 12.4 12.6 12.3 O2 (% vol) Fractional Moisture Content: 0.156 0.148 0.145 0.150 Sample Volume, V_{m(std)} 56.316 58.536 57.718 57.523 (dry std ft³): (dry std m³): 1.595 1.658 1.634 1.629 Measured Volumetric Flow Rate Q_{std} (std ft³/min): 771,285 774,313 770,833 772,144 Q_{std(dry)} (dry std ft³/min): 659,839 659,444 656,676 650,743 Net Mass Collected (µg) ADL Lead: 1.70 1.20 1.10 1.33 Metals Concentration (lb/dscf) ADL Lead: 6.65E-11 4.52E-11 4.20E-11 5.13E-11 Metals Emission Rate (lb/hr) ADL 2.60E-03 1.79E-03 2.02E-03 Lead: 1.66E-03 100.1 Isokinetic Variation (%): 102.6 101.2 101.3

ADL - all analytical values used to calculate and report an in-stack emissions value are greater than the laboratory's reported detection level(s)

English Units: Standard conditions of 29.92 in Hg and 68° F Metric Units: Standard conditions of 760 mm Hg and 20° C APPENDIX

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AETB and QI Information Summary

Facility Name:	Primary Energy – Cokenergy Facility	TRC
Location:	HRCC Stack 201	
	June 9, 2021	

Test Parameters:	1, 2, 3A, 4, 12			
QI Last Name:	Сасао			
Ql First Name:	Benigno			
QI Middle Initial:				
AETB Name:	TRC Environmental Corporation			
AETB Phone No:	312-533-2042			
AETB Email:	bcacao@trccompanies.com			
Group 1 Exam Date:	03/06/2020			
Provider Name:	Source Evaluation Society			
Provider Email:	<u>gstiprogram@gmail.com</u>			
Group 3 Exam Date:	07/24/2020			
Provider Name:	Source Evaluation Society			
Provider Email:	<u>qstiprogram@gmail.com</u>			
Group 4 Exam Date:	07/30/2020			
Provider Name:	Source Evaluation Society			
Provider Email:	gstiprogram@gmail.com			

This is to Certify that:

Benigno Cacao

Is a Qualified Individual as defined in Section 8.3 of ASTM D7036-04 for the following test methods:

EPA Methods 1, 1A, 2, 2A, 2C, 2D, 2F, 2G, 2H, 3, 3B, 4, 5, 5A, 5B, 5D, 5E, 5F, 5i, 17, 19, 201A, and 202.

The individual has met the minimum experience requirements defined in Section 8.3.4.2 of ASTM D7036-04 and has successfully passed a comprehensive examination for the test methods designated above.

This certification is effective until:

03-06-2025

Educal AME Lines

Edward J MacKinnon Air Measurements Practice Quality Manager

Date of Issue: 03-10-2020

Certificate Number: _____01547



This certificate is the exclusive property of TRC and is non-transferable.

This is to Certify that:

Benigno Cacao

Is a Qualified Individual as defined in Section 8.3 of ASTM D7036-04 for the following test methods:

EPA Methods 3A, 6C, 7E, 10, 10B, 19, 20, 25A.

CEM Performance Specifications PS2, PS3, PS4, PS4A, PS5, PS6, PS7, PS8, and PS15

The individual has met the minimum experience requirements defined in Section 8.3.4.2 of ASTM D7036-04 and has successfully passed a comprehensive examination for the test methods designated above.

This certification is effective until:

07-24-2025

Educad AM Lina

Edward J MacKinnon Air Measurements Practice Quality Manager

Date of Issue: 07-27-2020

Certificate Number: 01571

This certificate is the exclusive property of TRC and is non-transferable.

14 of 88

This is to Certify that:

Benigno Cacao

Is a Qualified Individual as defined in Section 8.3 of ASTM D7036-04 for the following test methods:

EPA Methods 1, 2, 3, 4, 12, 19, 29, 30B, 101, 101A, 102, and ASTM D6784-02.

The individual has met the minimum experience requirements defined in Section 8.3.4.2 of ASTM D7036-04 and has successfully passed a comprehensive examination for the test methods designated above.

This certification is effective until:

TRC Report 437378

ω

15 of 88

07-30-2025

AM Limos

Edward J MacKinnon Air Measurements Practice Quality Manager

Date of Issue: 08-03-2020

Certificate Number: 01573

This certificate is the exclusive property of TRC and is non-transferable.

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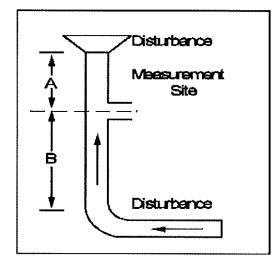
1

Run	Test Date	Start Time	End Time	Main Steam Flow [kpph]	Max Main Steam Flow [kpph]	Tested % Load [%]
1	6/9/2021	7:38	9:23	783	960	82%
2	6/9/2021	9:51	11:36	756	960	79%
3	6/9/2021	12:00	13:45	727	960	76%



Sample Location Information for Isokinetic Sampling - Round Ducts

Project #:	437378	
Company:	Primary Energy	
Plant:	Cokenergy Facility	/
Unit ID:	HRCC	
Sample Loca	ation: Stack 20)1
Distance A:	73.80 Feet,	4.10 Duct diameters
Distance B:	201.00 Feet,	11.17 Duct diameters
Meets Metho	od 1 criteria	



Duct Diameter:	216	inches	18.00 feet
# of Ports Used:			4
# of Points/Diameter:			6
Sample Plane:			Horizontal
Port Type:			Flange
Port Length:			7.0 inches
Port Inside Diameter:			6.0 inches

Traverse Point Locations

Point	% of diameter	Inches from wall	Inches from port edge
1	4.4	9.5	16.5
2	14.6	31.5	38.5
3	29.6	63.9	70.9

Pre-cyclonic flow check conducted?

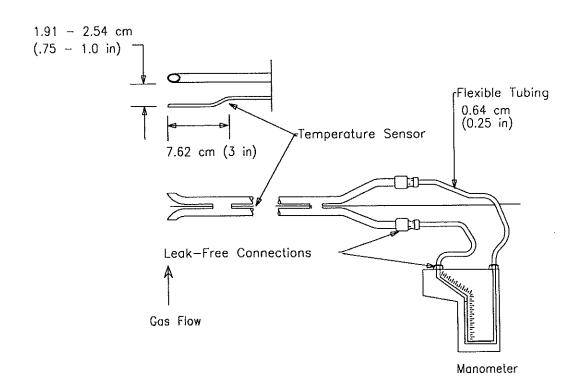
Reason: Conducted Previously

No



Determination of Stack Gas Velocity and Volumetric Flow Rate

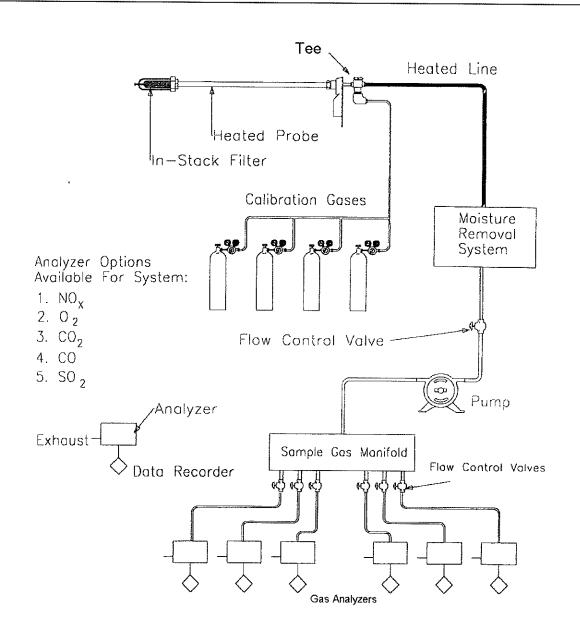
USEPA Promulgated Test Method 2





Determination of Multiple Gaseous Pollutants Using an Extractive Sampling Train

USEPA Promulgated Methods 3A and 6C

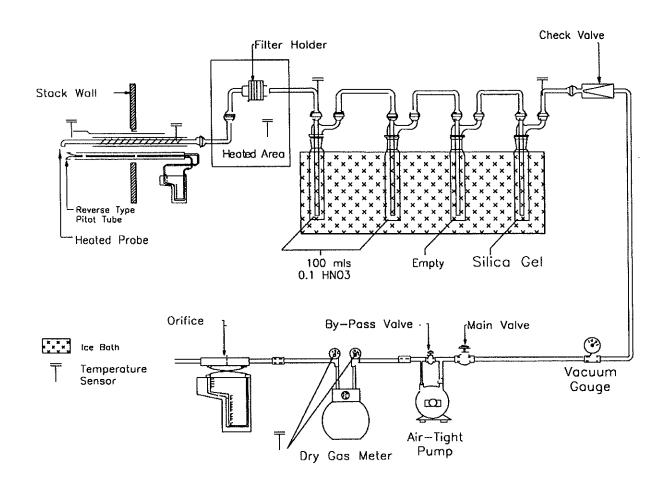




1

Determination of Inorganic Lead Emissions From Stationary Sources

USEPA Promulgated Method 12





	Method	12 Sample Ana	alysis Summar	у		
Project#:	437378		Unit ID:	HRCC		
Company:	Primary Energy Cokenergy Facility		Location:	Stack 201 June 9, 2021		
Plant:			Test Date(s):			
Filter Diameter (mm):	82	(NuTech)				
	G	Fross front-hal	f metals			
	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>	<u>Run 4</u>	Rea	gent Blank
Pb (µg)	1.70	1.20	1.10	-	<	0.10

Blank-corrected front-half metals					
	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>	<u>Run 4</u>	
Pb (µg)	1.70	1.20	1.10	-	
-	-	-	-	-	
* If a "Gross" Run value was below the	a value of 0.0				
If a Reagent Blank value was below th	a value of 0.0				

TRC Environmental Corporation

7521 Brush Hill Road Burr Ridge, IL 60527

Primary Energy – Lea Testing – Cokenergy Facility Client Project #: 437378

> Analytical Report EA Project # 0621-108

EPA Method 12 Pb

NELAP Cert. No. 04010



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Consequences

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Enthalpy Analytical, LLC Phone: (919) 850-4392 / www.enthalpy.com

800-1 Capitola Drive – Durham, NC 27713

Reviewed and Approved by:

AMCLOSS

Alexa Cross QA Associate II

June 23, 2021

I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible.
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s).

This analytical report was prepared in Portable Document Format (.PDF) and contains 9 pages.

Report Issued: 6/23/2021



EA Job# 0621-108 Page 2 of 9

Enthalpy Analytical Narrative Summary

TRC Environmental Corporation Company Job No. 0621-108 EPA Method 12 Client ID. 437378 – Primary Energy – Lea Testing – Cokenergy Facility Custody Alyssa Miller received the samples on 6-14-21 at a temperature of 8.9 C after being relinquished by TRC Environmental Corporation. The samples were received in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC. Preparation The samples were prepared and analyzed for lead using the procedures found in EPA Method 12, Determination of Inorganic Lead Emissions from Stationary Sources. and Analysis The Agilent Model 7700x, Inductively Coupled Plasma Mass Spectrometer "U" (Serial No.: JP13512898) was used for this analysis. Calibration The calibration curves met all method-specified precision criteria. QC Notes The analyte of interest was not identified at concentrations greater than the reporting limit in the analyses of the laboratory blanks. The analyte of interest for the Laboratory Control Spikes was within the acceptance limits of 80% to 120%. All of the Matrix Spike recoveries were within the acceptance range of 75% to 125%. All of the required duplicate samples had a relative percent difference of 20% or less or were less than five times the limit of quantitation. All of the samples were analyzed at least in duplicate.

Reporting Notes The results are presented as total micrograms of lead in each run.



EA Job# 0621-108 Page 3 of 9

Enthalpy Analytical Narrative Summary

Company	TRC Environmental Corporation
Job No.	0621-108 EPA Method 12
Client ID.	437378 – Primary Energy – Lea Testing – Cokenergy Facility
Reporting Notes	These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above.
Continued	
	The results presented in this report are representative of the samples as provided to the laboratory.



EA Job# 0621-108 Page 4 of 9



ANALYSIS REPORT

EA Project #: 0621-108 Client: TRC Environmental Corporation Client Project ID: 437378 - Primary Energy - Lea Testing - Cokenergy Facility

METHOD 12 Total Micrograms in Run

	Pb
Sample ID	μg
HRCC S201 M12 R1	1.7
HRCC_S201_M12_R2	1.2
HRCC_S201_M12_R3	1.1
Reagent Blank - Impinger	< 0.10
Reagent Blank - Filter	< 0.10

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	QC SUMMARY
Lab Blank (ppb)	< 1.0
LCS, % Recovery	102%
Spike, % Recovery	107%
Duplicate, RPD	1.4%

METHOD 12: LEAD

ICP-MS ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: TRC EA Proj. #: 0621-108 Analysis Date: 06-21						CPMS RL = CS Conc. = Analyst:		μg/L μg/L
Sample	e ID	Test	Dig'te					
		Sol'n	Conc	FV	Dilution			Total
Client	EA ID	µg/L	μg/L	ml	Factor			μg
Run 1	0621-108.1	16.8	16.8	100	1			1.7
Run 2	0621-108.2	11.8	11.8	100	1			1.2
Run 3	0621-108.3	11.3	11.3	100	1			1.1
Blank - Filter	0621-108.4F	0.8	0.8	100	1		<	0.10
Blank - Impinger	0621-108.41	0.9	0.9	100	1		<	0.10
			0.0	100	1		<	0.1
			0.0	100	1		<	0.1
			0.0	100	1		<	0.1
			0.0	100	1		<	0.1
			0.0	100	1		<	0.1
Lab Blank	0621-108.LB	0.34	0.3	100	1		<	0.1
LCS	0621-108.LCS	50. 9	101.8	100	2	101.8%	% Rec.	
Spike (50ppb)	0621-108.1S	70.4	70.4	100	1	107.2%	% Rec.	
Duplicate	0621-108.2D	11.6	11.6	100	1	1.4%	%RPD	

EA Job# 0621-108 Page 6 of 9

Chain of Custody Record

Page 1 of 2

Project Name	Primary Energy - Lea	Testing	IRC Contact	Gavin Lewis		Т. (312)53	3-2025		Analyses	lequired			·······
		Email:								General Instruction			
Site Name	Cokenergy Facility	<u></u>	Sampling Syster	tem Prepared by			1		1	documents all chan	- ,		
			Ben Cacao					Vieu				The name and date	-
Project No	· 437378		Samples Recove	red by		······		T P		1	1	each person associa release or receipt o	
•			Ben Cacao					(Lead			ļ	samples must be re	
		Sample Desc	ription*			Run Time	**No of) 21M				Samptes must be re	
Sub Lab ID	Sample ID Number	(Unit-Location-Method-Rur	-Container Numi	ber)	Date Sampled	(Optional)	Containers	Σ				Comme	ents.
	378001	HRCC_\$201_M1	2_R1_C1		6/9/2021			×				Filter	
	378002	HRCC_\$201_M1	2_R1_C2		6/9/2021			×				0 1N HNO3 Probe R	Inse
	378003	HRCC_5201_M1	2_R1_C3		6/9/2021			x				Impinger 0 1N HNO	3
	378004	HRCC_\$201_M1	.2_R1_C3		6/9/2021			x				Impinger 0 1N HNO	3
	378005	HRCC_\$201_M1	2_R2_C1		6/9/2021			x				Filter	
	378006	HRCC_\$201_M1	2_R2_C2		6/9/2021			x				0 1N HNO3 Probe R	inse
	378007	HRCC_\$201_M12_R2_C3			6/9/2021			x				Impinger 0 1N HNO	3
	378008	HRCC_S201_M12_R2_C3			6/9/2021			x				Impinger 0.1N HNO	3
	378009	HRCC_5201_M12_R3_C1			6/9/2021			×				Fliter	<u> </u>
	378010	HRCC_S201_M12_R3_C2		6/9/2021			x				0.1N HNO3 Probe RI	nse	
	378011	HRCC_\$201_M1	2_R3_C3		6/9/2021			×	L		_	Impinger 0.1N HNO3	}
	378012	HRCC_S201_M1	2_R3_C3		6/9/2021			x				Impinger 0 IN HNO3	5
	378013	HRCC_5201_M1	2_RB_C4		6/9/2021			<u>×</u>			1	Filter Blank (2 pcs)	
TAT Star	ndard Need By Da	te Project Remar	ks		Reling	uished by (Sl	an & Print)		Date/Time			by (Sign & Print)	Date/Time
ipped by	Shipped On	M12 (Lead Ana	lysis)			- FEZ			6-10-7	1 La	₽ X	tion	6/10/21
Տուլ	n To Attn				11 DEN	TOPE	AU		0900	1 Gt	alle	Swanson	9:10
	Lab Enthalpy Ana	Ilyticai			the su	e.			8:45	R	then-	Wind	08: 13
800 Capitola Drive Ste 1			i	Gail S.	Janson			6/11/21		24	Ward	6-11-21	
Address Durham, NC 27713				Jan C	ral	to Whe	2	5:55P	~ ale	pai	miller _	Qo.14.21	
	Phone 919-850-439	2			Dra C	NErd			6.12.2	1 Aly	<u>559</u>	mmiller	0760
cial Instruction	s. Sample ID #s	378003 and 378004 are the same sa	mple Run 1 (Nee	d to be combl	ned as one sample	e)				TRCE	nvironr	mental Corporation	n
ple 1D #s 3780	07 and 378006 are the	same sample Run 2 (Need to be com	ibined as one sam	nple)								7521 Brush Hill Road	• •
mple ID #s 378011 and 378012 are the same sample Run 3 (Need to be combined as one sample)								Ridge, Illinois 60527 U 533-2042 F: (312)533					
ONTRACTOR	LABORATORY MUST C	ONTACT THE CITED TRC CONTACT TO	DENSURE A PO IS	S IN PLACE.						7	, (315		

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EA Job# 0621-108 Page 7 of 9

8.9°C Raufet 2, good condition Amm3 010.14.21

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TRC Report 437378 B

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2 of 2 Page

Project Name	e Primary Energy - Lea To	esting	TRC Contact Gavin Lev	wis	T (312)533	-2025		Analyses F	equired	General Instructions	This form
÷			Email. glewis@	Email. glewis@trccompanies.com						documents all change	
Site Name	e Cokenergy Facility		Sampling System Prepare	ed by			M12 (Lead Analysis)			The name and dated	•
			Ben Cacao				€nA			each person associat	-
Project No	437378		Samples Recovered by				ad			release or receipt of	
i lojeci no			Ben Cacao				e1)			samples must be reci	
	<u> </u>	Sam	ple Description*	- <u>.</u>	Run Time	**No of	112				
Sub Lab ID	Sample ID Number		hod-Run-Container Number)	Date Sampled	(Optional)	Containers	2			Commer	ts:
	270014		201_M12_RB_C5	6/9/2021		1	×			0.1N MNO3 Blank	
<u></u>	378014	10.00-2									
······································											
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	-										
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								Data (Trata	Bacow	ed by (Sign & Print)	Date/Time
JAT 5t	andard Need By Dat	е Ргоје	ct Remarks	Relin	quished by: (S	ian & Print)		Date/Time		-0	
Shipped by	Shipped On	M12	(Lead Analysis)		$\rightarrow \pm$			6-10-2	1 Val	Xuan	6/10/21
	hlp To Attn:				on of	CAO	-	0900	Gale	Swanson	9:10
<u>،</u>		L stimul		Har 1	<u> </u>			GUDI	Oh	-12ml	08:45
	Lab Enthalpy Ana	iytical	·····		en			WILPI	00.	Ward	
	800 Capitola	Orive Ste 1		Gale	Suranso	?		8:45	Dan	~	6-11-21
	Address Durham, NC	27713		Q	1 and	to WIC	22	5:55 P	- alenno	mmale	06.14-21
	Phone 919-850-439							6-12-2		m miller	0700
	Filone 515-650-435	<u> </u>		1/1/22	<u> </u>			-		nmental Corporatio	1
Special Instruction	ons			······································							•
										7521 Brush Hill Road	<i></i>
		······							1	urr Ridge, Illinois 60527 U	
									^{T· (3)}	2) 533-2042 F (312)53	-2070
URCONTRACTO	R LABORATORY MUST C	ONTACT THE CITED TRC CO	NTACT TO ENSURE A PO IS IN PLA	CE.					ļ		

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EA Job# 0621-108 Page 8 of 9

This Is The Last Page Of This Report.



EA Job# 0621-108 Page 9 of 9

TRC Report 437378 B

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-						
Company:	Primary Ene				Run:	1
Plant:	Cokenergy F	acility			Test Date:	6/9/2021
Unit:	HRCC					
Test Location:						
Method:	Method 12					
X-Facto	r Isokinetic S	ampling Coefficie	nt (based on pre-test	data)		
X-Factor =	846.72	2 x (D _n) ⁴ x ΔH _{@ł x} ($C_{0}^{2} x (1 - B_{uc})^{2} x - \frac{1}{2}$		$\frac{(M_d \times T_m \times F)}{(M_d \times T_s \times (P_{bar} + (\Delta T_s \times (P_{bar} + (\Delta T_s \times (P_{bar} + (\Delta T_s \times (P_{bar} + (P_{b$	P₅) The superior of the super
			- p - (- 43)	(M _s	$\times T_s \times (P_{bar} + (\Delta$	H _{@(} /13.6)))
Where:						
T _s = Temperat	ure of effluent	gas (°R)				
T _m = Average (dry test meter	temperature (°R)				
D _n = Nozzle Di	iameter (in.)					
$\Delta H_{@I} = Orifice$	pressure drop	corresponding to 0	.75 cfm meter flow rate	e (in. H ₂ 0)		
C _p = Pitot Tube	e Coefficient (o	timensionless)				
B _{ws} = Effluent of	gas fractional r	moisture content (di	imensionless)			
M _d = Dry mole	cular weight of	exhaust (lb/lb-mole	e)			
M _s = Molecular	r weight of exh	aust, wet basis (lb/i	b-mole)			
P _s = Absolute i	flue gas pressi	ure ("Hg)				
P _{bar} = Ambient	barometric pr	essure at sample el	levation ("Hg)			
D _o =	= 0.205	in.	P _s =	29.02	in. Hg abs.	
ΔH _{@I} =		 in. H₂0	т <u>s —</u> М _s =	29.02	itt. Fig abs. lb/lb-mole	
C ₀ =	*******	(dimensionless)	T _s =	730	°R	
M _d =		lb/lb-mole	P _{bar} =	29.11	in. Hg	
T _m =		°R	B _{ws} =	0.138	(dimensionless)	
. (†)		'`		0.100	(unionaloness)	
	X-Factor	= 1.480				
	X-1 40(0)		_			

Dry Molecular Weight

 $M_d = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$

Where:

M_d = Dry molecular weight of exhaust (lb/lb-mole)

%CO2 = Effluent gas Carbon Dioxide Content (% volume, dry basis)

%O₂ = Effluent gas Oxygen Content (% volume, dry basis)

%N₂ = Effluent gas Nitrogen Dioxide Content (% volume, dry basis)

 $%CO_2 = 6.2$ %vol dry $%N_2 = 81.8$ %vol dry $%O_2 = 12.0$ %vol dry

M_d = _____10/1b-mole



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Company: Plant: Unit: Test Location: Method: Wet Molecular	Method 12	Run: Test Date:	1 6/9/2021
	$M_s = Md \times (1-Bws) + (18.015 \times Bws)$		
• •	as molecular weight (lb/lb-mole, wet basis) t gas fractional moisture content (dimensionless)		
M _d =	$=$ 29.47 lb/lb-mole $B_{\rm ws} =$ 0.156	_	
	M _s = <u>27.68</u> lb/lb-mole		
Effluent Gas P	ressure		
P _g = Flue gas	$P_s = P_{bar} + (P_t/13.6)$ pressure ("Hg) t barometric pressure at sample elevation ("Hg) gauge pressure ("H ₂ O) = <u>29.11</u> "Hg $P_g = -1.20$ $P_s = 29.02$ "Hg	_"H₂O	
r			
T _{min} = Tempe	$T_{m} = \sum_{i=1}^{n} (T_{mini +} T_{mouti})/2$ $I_{m} = \frac{\sum_{i=1}^{n} (T_{mini +} T_{mouti})/2}{n}$ dry test meter temperature (°R) rature of gas entering dry test meter (°R) erature of gas leaving dry test meter (°R)		L
Avg T _{min}	= <u>547.1</u> °R Avg T _{mout} = <u>546.2</u>	_°R	
	$T_m =546.6 ^{\circ}R$		



 Company:
 Primary Energy
 Run:

 Plant:
 Cokenergy Facility
 Test Date:

 Unit:
 HRCC
 Test Date:

 Test Location:
 Stack 201
 Method:

 Method:
 Method 12
 Test Date:

 ΔH at Sample Point - Example Point
 1-1

 $\Delta H_i = X$ -Factor x ΔPi x Tmi/Tsi
 Where:

 ΔH_i = Pressure differential across calibrated orifice at point *i* ("H₂O)

 ΔP_i = Velocity head across pitot at point *i* ("H₂O)

Ts = Temperature of effluent gas (°R)

 X-Factor = 1.48
 $\Delta Pi = 1.20$ "H₂O

 Tmi = 544.2
 °R

 Tsi = 729.7
 °R

 $\Delta H_{i} = 1.32$ "H₂O

Sample Volume at Standard Conditions

 $V_{m(std)} = (T_{std}/29.92) \times Y \times V_m \times (P_{bar} + \Delta H/13.6)/T_m$

Where:

V_{m(std)} = Sample volume collected, corrected to 29.92 inHg and 527.67°R (ft^a, dry basis)

- Y = Dry test meter calibration coefficient (dimensionless)
- V_m = Sample volume collected at actual conditions (ft³, dry basis)

T_{std} = Standard Temperature 527.67 (°R)

 ΔH = Average pressure differential across calibrated orifice ("H₂0)

Y =	0.991		V _m =	60.325	cf
P _{bar} =	29.110	"Hg	ΔH =	1.21	
T _m =	546.6	°R	T _{std} =	527.67	°R

V_{m(std)} = _____56.316 ____dscf

Volume of Water Vapor Condensed

 $V_{wc(std)} = 0.04716 \text{ x} (Tstd / 527.67) \text{ x} M_{H2O}$

Where:

 $V_{wc(std)}$ = Volume of water vapor condensed, corrected to 29.92 inHg and 527.67°R (ft³, wet basis) M_{H2O} = Net weight gain of impingers (grams)

M_{H2O} = 221.2 grams

V_{wc(std)} = ____10.432____wscf

1 6/9/2021



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Company: Plant: Unit: Test Location: Method:	Primary Energy Cokenergy Facility HRCC Stack 201 Method 12	114111	1 6/9/2021
Moisture Conte	int		
	$B_{ws} = \frac{V_{wc(std)}}{V_{wc(std)} + V_{m(std)}}$		
V _{wc(std)} =	$V_{m(std)} =56.316$	dscf	
	B _{ws} =0.156		
Average Duct \	/elocity		
C_p = Pitot calib Sqrt ΔP (avg) C_p = T_s =	$V_{s} = 85.49 \times C_{p} \times \text{Sqrt} \Delta P \text{ (avg)} \times (T_{s}/(P_{s} \times M_{s}))^{1/2}$ relocity of effluent gas (ft/sec) pration coefficient (dimensionless) $= \text{Average of the square roots of } \Delta P\text{'s at all traverse points}$ $= \underbrace{\begin{array}{c} 0.840 \\ 730.2 \\ 27.68 \\ \end{array}}_{s} \exp \left(\frac{P_{s}}{P_{s}}\right) = \underbrace{\begin{array}{c} 1.053 \\ 29.02 \\ 29.02 \\ \end{array}$	"Hg	
Method 2 Volu	metric Flow Rate (Actual Basis)		
	Q = $V_s \times A \times 60$ as volumetric flow rate at actual conditions (ft ³ /min) tional area of duct at sample location (ft ²)		
Vs	= <u>72.07</u> ft/sec A = <u>254.469</u>	ft ²	
	Q = <u>1,100,308</u> cfm		



1 Company: Primary Energy Run: 6/9/2021 Plant: Cokenergy Facility Test Date: Unit: HRCC Test Location: Stack 201 Method: Method 12 Method 2 Volumetric Flow Rate (Standard Basis) $Q_{std} = \frac{T_{std} \times Q \times P_s}{T_s \times 29.92}$ Where: Q_{std} = Effluent gas volumetric flow rate corrected to 29.92 in. Hg and 527.67°R (ft³/min) Q = 1100308 cfm P_s = <u>29.02</u> "Hg $T_s = 730.2$ °R Q_{std} = ____771,285 scfm Method 2 Volumetric Flow Rate (Standard Dry Basis) $Q_{std(dry)} = Q_{std} \times (1-Bws)$ Where: Q_{std(dry)} = Effluent gas volumetric flow rate corrected to 29.92 inHg and 527.67°R (ft³/min, dry basis) Q_{std} = 771285 scfm B_{ws} = 0.156 Q_{std(dry)} = ____650,743 dscfm Isokinetic Variation: $I = \frac{0.0945 \text{ x Ts x Vm(std) x 527.67}}{V_{s} \text{ x } \theta \text{ x } A_{\eta} \text{ x P}_{s} \text{ x } (1\text{-}\text{Bws}) \text{ x } T_{std}}$ Where: I = Percent of isokinetic sampling (dimensionless) θ = Total sample collection time (min) An = Cross-sectional area of nozzle (ft²) ⁰R $V_{m(std)} = \frac{56.316}{\theta = 96.0}$ T_s = 730.2 dscf V_s = 72.066 ft/sec min 29.02 $P_s =$ "Hg $A_0 = 0.000229$ ft² B_{ws} = 0.156

100.1 %

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TRC

roject Number.		437378		Test Date:	June 9, 2021	
Customer:		Primary Energy		Facility:	Cokenergy Facility	
Unit Identification		HRCC		Run #:	1	
Sample Location		Stack 201		Selected Metal:	Lead:	
Lead:	Concentration (µg/dscm	1)				
	C _s =	$\frac{M}{V_{m(std)}}$				
	Where:					
	C _s = Concentra	ation of selected metal, µg/ds	scm			
		ected, microgram, μg				
	V _{m(std)} = Votume of	f sample gas in dry standard	cubic meters			
	M = 1.700 $C_s = 1.066$		std) ⁼ 1.595	dry std. m ³		
Lead:	Concentration (lb/dscf):	:				
	$C_d = \frac{1}{2}$	$\frac{M}{(10^6 \times 453.6)}$				
	Where:					
	C _d = Concentra	ation of selected metal, lb/ds	cf			
		ected, microgram, µg				
		n, 453.6 grams to lbs				
	V _{m(std)} = Volume of	f sample gas in dry standard	l cubic feet			
	V _{m(std)} =5.632E	+01_dscf				
	C _d = <u>6.655</u> E	-11 lb/dscf				
	Emission Rate (lb/hr):					

Where:

ER = Emission Rate of Selected Metal, lb/hr

C_d = Concentration of selected metal, lb/dscf

60 = conversion, 60 minutes/hr

 $Q_{sto(dry)}$ = Stack gas volumetric flow rate, dry standard cubic feet per minute

 $C_{d} = \underbrace{6.655E\text{--}11}_{\text{bl/dscf}} \\ Q_{\text{std(dry)}} = \underbrace{650743}_{\text{fl}^3/\text{min}} \\ fl^3/\text{min}$

ER = _____1598E-03___1b/hr



Example Calculations - Effluent Gas Concentration Determination

437378

Project Number: Customer: Unit Identification: Sample Location:

Run

$$C_{gas} = (C - C_0) \times \frac{C_{ma}}{C_m - C_0}$$

Where:

Coas = Effluent gas concentration (ppm or %vol)

C = Average gas concentration indicated by analyzer (ppm or %vol)

C₀ = Average of pre- and post-test system bias checks using low range gas (ppm or % vol) C_{m} = Average of pre- and post-test system bias checks using upscale gas (ppm or % vol) C_{ma} = Actual concentration of upscale gas (ppm or % vol)

CO2	C C _m		: %vol ! %vol	C ₀ = C _{ma} =	0.05 %vol 8.795 %vol
	C _{CO2} =	6.2	: %vol		
02	C C _m		! %vol i %vol	C ₀ = C _{ma} =	0.18 %vol 10.19 %vol

C₀₂ = 12.0 %vol Note: Interim results are not rounded.

TRC

Isokinetic Test Support Data Company: Primary Energy Project#: 437378 Plant: Cokenergy Facility Test Method(s): Method 12 Unit ID: HRCC Test Run #: 1 Test Date(s): 6/9/2021 Location: Stack 201 Console Operator: Ryan Novosel Unit Operating Mode: Normal ft² Console ID: E33 Duct Shape/Area: Round 254.47 Meter Y: 0.991 F_d Factor: dscf/MMBtu 1.801 Orifice $\Delta H_{@i}$: scf/MMBtu F_c Factor: Pitot Tube ID: 727 F_w Factor: wscf/MMBtu Cal. coefficient (C_p): 0.84 Fuel heat content: Btu / Probe Liner Material: Process/fuel flow rate: Glass Nozzle Material: Stainless steel Soot blown? Fuel Type: Nozzle Diameter (D_n): 0.205 Duration: in min Sample collection time Tare wt. Final wt: Total # of points: 12 Contents (grams) lmp # (grams) Target Sample time/point: 8.0 1 0.1N HNO3 727.4 882.0 min Target run duration: 0.1N HNO3 642.5 685.6 96.0 min 2 3 Empty 643.8 649.4 Barometric Pressure (Pbar): 29.11 in Hg 4 Silica 730.3 748.2 Stack Static Pressure (Pg): -1.20 in H2O Stack Pressure (Ps): 29.02 in Hg Leak Checks 0.004 Net grams (M_{H20}): 221.2 Pre-Test Train Leak Check: CFM @ 16 "Hg Pre-Test Pitot Leak Check: (Pass or Fail) Pass Gas Molecular Weight Method: Post-Test Train Leak Rate: 0.009 CFM @ 16 "Hg Method 3A, Instrumental Post-Test Pitot Leak Check: Pass 6.2 (Pass or Fail) % CO₂ : %vol dry 12.0 Pump/Orifice Leak Check: Pass (Pass or Fail) % O₂ : %vol dry % Nitrogen + % CO : Filter/Thimble ID: 81.8 %vol dry **Tare Weight:** grams M_d - dry basis : 29.472 lb/lb-mole **Description of Filter and Front Half Rinses: Description of Impinger liquid:**

General Comments:



Isokinetic Test - Processed Traverse Data

Plant:	Primary Energy Cokenergy Fac HRCC Stack 201		Project #: Method(s): Run #:	Method 12		_	Test Date: X-Factor: linutes/pt:	1.480
Port &	I	Meter	T		Dry Ga	s Meter	Orifice	Sample
Point ID	Clock Time	Volume (V _m) ft ³	Δ Ρ ("H₂O)	Stack (Ts) °F	Inlet (T _{min}) °F	Outlet (T _{mout}) °F	∆H ("H₂O)	Vacuun ("Hg)
1-1	7:38:00	762.500	1.20	270	84	84	1.30	4.0
1-1	7:42:00	765.160	1.20	270	85	84	1.30	4.0
1-2	7:46:00	767.730	1,20	271	85	84	1.30	4.0
1-2	7:50:00	770.280	1.20	271	86	85	1.30	4.0
1-3	7:54:00	772.650	0.92	270	86	85	1.00	4.0
1-3	7:58:00	775.270	0.92	270	86	85	1.00	4.0
	8:02:00	777.700						
2-1	8:05:00	777.700	1.20	271	86	86	1.30	4.0
2-1	8:09:00	780.220	1.20	271	87	86	1.30	4.0
2-2	8:13:00	782.750	1.10	270	88	86	1.20	4.0
2-2	8:17:00	785.310	1.10	270	88	86	1.20	4.0
2-3	8:21:00	787.850	1.00	270	88	87	1.10	4.0
2-3	8:25:00	790.320	1.00	270	89	87	1.10	4.0
	8:29:00	792.781	"					
3-1	8:32:00	792.781	1.20	271	88	87	1.30	4.0
3-1	8:36:00	795.310	1.20	271	88	88	1.30	4.0
3-2	8:40:00	797.750	1.20	271	89	88	1.30	4.0
3-2	8:44:00	800.430	1.20	271	89	88	1.30	4.0
3-3	8:48:00	803.000	1.00	271	89	88	1.10	4.0
3-3	8:52:00	805.500	1.00	271	90	88	1.10	4.0
	8:56:00	808.000						
4-1	8:59:00	808.000	1.10	271	87	87	1.20	4.0
4-1	9:03:00	810.520	1.10	271	87	87	1.20	4.0
4-2	9:07:00	813.980	1.10	270	88	87	1.20	4.0
4-2	9:11:00	815.430	1.10	270	88	87	1.20	4.0
4-3	9:15:00	817.860	1.10	270	89	88	1.20	4.0
4-3	9:19:00	820.350	1.10	270	89	88	1.20	4.0
	9:23:00	822.825						
Run T	imes:	V _m , ft ³	Ave. ΔP	T _s , °F	T _m	,°F	ΔН	Max. Va
Start	7:38	60.325	1.11	270.5	87.5	86.5	1.208	4
End	9:23		Ave. √ΔP 1.05	T _s , °R 730.2		T _m , °R 6.6		

ompany: <u>Primary Energy</u> Plant: <u>Cokenergy Facili</u>				Support Data			
Plant: Cokenergy Facili				Project#:	437378		_
	ty			Test Method(s):	Method 12		-
Unit ID: HRCC				Test Run #:	2		-
ocation: Stack 201				Test Date(s):	6/9/2021		
onsole Operator:	Ryan Novosel			Unit Operating Mode:	Normal		
onsole ID:	E33	-		Duct Shape/Area:		/ 254.47	- ft ²
Neter Y:	0.991			F _d Factor:		dscf/MMBtu	
Drifice ΔH _{@i} :	1.801	-		F _c Factor:		scf/MMBtu	
tot Tube ID:	727	-		F _w Factor:		wscf/MMBtu	
Cal. coefficient (C _p):	0.84	-		Fuel heat content:	:	Btu	1
obe Liner Material:	Glass			Process/fuel flow rate:			
ozzle Material:	Stainless steel	_		Soot blown?		Fuel Type:	
lozzle Diameter (D _n):	0.205	in		Duration:		min	
ample collection time						Tare wt.	Final wt
otal # of points:	12		Imp #	Contents		(grams)	(grams
arget Sample time/point:	8.0 min			0.1N HNO3		655.8	832.1
arget run duration:	<u>96.0</u> min			0.1N HNO3		745.4	767.8
			3	Empty		562.4	564.6
arometric Pressure (P _{bar}):	in Hg			Silica		801.5	815.8
tack Static Pressure (P _g):	<u>-1.20</u> in H2O						
tack Pressure (P _s):	in Hg			·			
eak Checks							
re-Test Train Leak Check:	0.003 CFM @ 15	"Hg			Net	grams (M _{H20}):	215.2
re-Test Pitot Leak Check:	Pass (Pass or Fail)		_				
ost-Test Train Leak Rate:	0.003CFM @15			lecular Weight Method:			
ost-Test Pitot Leak Check:	· · · · · ·		Method	3A, Instrumental	% CO2 :	5.8	%vol dry
ump/Orifice Leak Check:	Pass (Pass or Fail)	ł			% O ₂ :		%vol dry
ilter/Thimble ID:					gen + % CO :	··· · · · ·	%vol dry
are Weight:	gram	S		M	_d - dry basis :	29.424	lb/lb-mole

General Comments:

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Isokinetic Test - Processed Traverse Data

Plant: Unit: Location:		cility	Method(s): Run #:			M	X-Factor: linutes/pt:	
Port &		Meter	1		Dry Ga	s Meter	Orifice	Sample
Point ID	Clock Time	Volume (V _m) ft ³	ΔP ("H ₂ O)	Stack (Ts) °F	Inlet (T _{min}) °F	Outlet (T _{mout}) °F	ΔH ("H₂O)	Vacuum ("Hg)
1-1	9:51:00	825.300	1.20	271	87	88	1.30	4.0
1-1	9:55:00	828.010	1.20	271	87	88	1.30	4.0
1-2	9:59:00	830.720	1.10	271	87	87	1.20	4.0
1-2	10:03:00	833.370	1.10	271	88	87	1.20	4.0
1-3	10:07:00	836.040	0.99	270	88	87	1.10	4.0
1-3	10:11:00	838.700	0.99	270	89	87	1.10	4.0
	10:15:00	841.341						
2-1	10:18:00	841.341	1.20	270	88	87	1.30	4.0
2-1	10:22:00	844.000	1.20	270	88	87	1.30	4.0
2-2	10:26:00	846.870	1.20	270	88	87	1.30	4.0
2-2	10:30:00	849.230	1.20	270	89	88	1.30	4.0
2-3	10:34:00	851.850	1.10	270	89	88	1.20	4.0
2-3	10:38:00	854.470	1.10	270	90	88	1.20	4.0
	10:42:00	857.078						
3-1	10:45:00	857.078	1.20	271	88	88	1.30	4.0
3-1	10:49:00	859.700	1.20	271	88	88	1.30	4.0
3-2	10:53:00	862.290	1.10	271	88	88	1.20	4.0
3-2	10:57:00	864.880	1.10	271	89	88	1.20	4.0
3-3	11:01:00	867.470	0.96	270	89	88	1.20	4.0
3-3	11:05:00	870.040	0.96	270	89	88	1.20	4.0
	11:09:00	872.611						
4-1	11:12:00	872.611	1.20	269	88	87	1.30	4.0
4-1	11:16:00	875.210	1.20	269	88	87	1.30	4.0
4-2	11:20:00	877.770	1.20	269	89	88	1.30	4.0
4-2	11:24:00	880.340	1.20	269	89	88	1.30	4.0
4-3	11:28:00	882.970	0.97	269	89	88	1.10	4.0
4-3	11:32:00	885.450	0.97	269	90	88	1.10	4.0
_	11:36:00	888.015						
Run T		V _m , ft ³	Ave. ΔP	T _s , °F		۴	ΔH	Max. Va
Start	9:51	62.715	1.12	270.1	88.4	87.6	1.233	4
End	11:36		Ave. √∆P	T _s , °R		T _m , ⁰R		
mments/No	F		1.06	729.8	54	7.7		

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ovosel	in	Imp #	Project#: Test Method(s): Test Run #: Test Date(s): Unit Operating Mode: Duct Shape/Area: F _d Factor: F _c Factor: Fw Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:	Method 12 3 6/9/2021 Normal Round	/ 254.47 dscf/MMBtu scf/MMBtu wscf/MMBtu Btu Fuel Type: min Tare wt.	- - ft ² / Final wt:
s steel	in	Imp #	Test Run #: Test Date(s): Unit Operating Mode: Duct Shape/Area: F _d Factor: F _c Factor: Fw Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:	3 6/9/2021 Normal Round	dscf/MMBtu scf/MMBtu wscf/MMBtu Btu Fuel Type: min	I
s steel	in	Imp #	Test Date(s): Unit Operating Mode: Duct Shape/Area: F _d Factor: F _w Factor: Fw Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:	6/9/2021 Normal Round	dscf/MMBtu scf/MMBtu wscf/MMBtu Btu Fuel Type: min	I
s steel	in	Imp #	Unit Operating Mode: Duct Shape/Area: F _d Factor: F _e Factor: Fw Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:	Normal Round	dscf/MMBtu scf/MMBtu wscf/MMBtu Btu Fuel Type: min	I
s steel	in	Imp #	Duct Shape/Area: F _d Factor: F _c Factor: F _w Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:	Round	dscf/MMBtu scf/MMBtu wscf/MMBtu Btu Fuel Type: min	I
s steel	in	Imp #	Duct Shape/Area: F _d Factor: F _c Factor: F _w Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:	Round	dscf/MMBtu scf/MMBtu wscf/MMBtu Btu Fuel Type: min	I
	in	Imp #	F _d Factor: F _c Factor: F _w Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:		dscf/MMBtu scf/MMBtu wscf/MMBtu Btu Fuel Type: min	I
	in	Imp #	F _c Factor: F _w Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:		scf/MMBtu wscf/MMBtu Btu Fuel Type: min	
	in	Imp #	F _w Factor: Fuel heat content: Process/fuel flow rate: Soot blown? Duration:	······································	wscf/MMBtu Btu Fuel Type: min	
	in	Imp #	Fuel heat content: Process/fuel flow rate: Soot blown? Duration:		Btu Fuel Type: min	
	in	Imp #	Process/fuel flow rate: Soot blown? Duration:		Fuel Type: min	
	in	Imp #	Soot blown? Duration:		min	Final wt:
	in	Imp #	Duration:		min	Final wt:
min	1	lmp #				Final wt:
— min		lmp #	Contonto		Tare wt.	Final wt:
— min		lmp #	Contonta		ruio ire.	T Intel We
— min		map o			(grams)	(grams)
		1	0.1N HNO3		761.3	927.0
min		2	0.1N HNO3		640.1	663.6
						594.2
in Ha					•	857.8
					3	
			·	·····		
CFM @	15 "Hg			Net	grams (M _{H20}):	206.6
	•	Gas Mo	blecular Weight Method:			
			i 3A, Instrumental	% CO ₂ :	5.7	%vol dry
`	,		-		12.6	%vol dry
_,	,		% Nitro	_		%vol dry
	arame			-		lb/lb-mole
	in H2O in Hg (Pass or CFM @ (Pass or (Pass or (Pass or	in H2O in Hg CFM @ 15 "Hg (Pass or Fail) CFM @ 15 "Hg (Pass or Fail) (Pass or Fail) - - - grams	in H2O in Hg CFM @ 15 "Hg (Pass or Fail) CFM @ 15 "Hg Gas Mo (Pass or Fail) (Pass or Fail) (Pass or Fail) grams	in Hg 4 Silica in H2O in H2O in Hg	in Hg A Silica	in Hg 4 Silica 842.7 in H2O in Hg 4 Silica 842.7 in Hg 842.7 CFM @ 15 "Hg Net grams (M _{H20}): (Pass or Fail) CFM @ 15 "Hg Gas Molecular Weight Method: (Pass or Fail) Method 3A, Instrumental % CO ₂ : 5.7 (Pass or Fail) % O ₂ : 12.6

General Comments:



Isokinetic Test - Processed Traverse Data

Company:	Primary Energy	Project #:	437378	Test Date: 6/9/2021
Plant:	Cokenergy Facility	Method(s):	Method 12	X-Factor: 1.480
Unit:	HRCC	Run #:	3	Minutes/pt: 4
Location:	Stack 201			

Port &		Meter			Dry Ga	s Meter	Orifice	Sample
Point	Clock	Volume (V _m)	ΔΡ	Stack (Ts)	Inlet (T _{min})	Outlet (T _{mout})	ΔH	Vacuum
D	Time	ft ³	("H ₂ O)	°F	°F	°F	("H₂O)	("Hg)
1-1	12:00:00	888.500	1.20	269	86	86	1.30	4.0
1-1	12:04:00	891.010	1.20	269	86	86	1.30	4.0
1-2	12:08:00	893.650	1.20	269	87	86	1.30	4.0
1-2	12:12:00	896.270	1.20	269	87	86	1.30	4.0
1-3	12:16:00	898.880	1.00	268	87	87	1.10	4.0
1-3	12:20:00	901.480	1.00	268	88	87	1.10	4.0
	12:24:00	904.073						
2-1	12:27:00	904.073	1.10	269	87	87	1.20	4.0
2-1	12:31:00	906.630	1.10	269	87	87	1.20	4.0
2-2	12:35:00	909.000	1.10	268	87	87	1.20	4.0
2-2	12:39:00	911.680	1.10	268	87	87	1.20	4.0
2-3	12:43:00	914.180	0.93	268	88	87	1.00	4.0
2-3	12:47:00	916.690	0.93	268	88	87	1.00	4.0
	12:51:00	919.190						
3-1	12:54:00	919,190	1.20	269	88	87	1.30	4.0
3-1	12:58:00	921.810	1.20	269	88	88	1.30	4.0
3-2	13:02:00	924.410	1.20	269	90	88	1.30	4.0
3-2	13:06:00	927.020	1.20	269	90	88	1.30	4.0
3-3	13:10:00	929.620	1.00	268	90	89	1.10	4.0
3-3	13:14:00	932.220	1.00	268	91	89	1.10	4.0
	13:18:00	934.828						
4-1	13:21:00	934.828	1.20	268	88	88	1.30	4.0
4-1	13:25:00	937.440	1.20	268	88	88	1.30	4.0
4-2	13:29:00	940.040	1.20	267	89	88	1.30	4.0
4-2	13:33:00	942.630	1.20	267	89	88	1.30	4.0
4-3	13:37:00	945.220	0.97	267	90	89	1.10	4.0
4-3	13:41:00	947.810	0.97	267	90	89	1.10	4.0
	13:45:00	950.383						
Run T	imes:	V _m , ft ³	Ave. ΔP	T _s , °F	T _m	, °F	ΔH	Max. Vac.
Start	12:00	61.883	1.11	268.3	88.2	87.5	1.208	4
End	13:45		Ave. √∆P	T _s , °R	Ave.	T _m , °R		
			1.05	727.9		7.5		
omments/No	otes:			•				



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Instrumental Reference Method Field Data

Project Number:	437378	Date:	6/9/2021	
Customer:	Primary Energy	Facility:	Cokenergy Facility	
Unit Identification:	HRCC	Recorded by:	Ben Cacao	
Sample Location:	Stack 201	Fc Factor:	-	
Load Level/Condition:	> 50% Load	Ed Factor.	-	

·····		RM Analyzer Information		
Reference N	Aethod Probe Type (Moisture E	Basis):	Extractive (Dry)	
Pollutant	Manufacturer	Model #	Serial Number	
NO _X	*	-	-	
SO ₂	-	-	-	
со	-	-	-	
CO ₂	Servomex	1440	1440DI/3759	
O ₂	Servomex	1440	1440DI/3759	

		Reference	Method Initial Ca	libration Error Test				
Pollutant	Cal Gas	Cal G	ias Cylinder Infor	mation	Anaiyzer	Absolute	%	Error
Foliulani	Level	Concentration	Exp Date	ID #	Response	Difference	Cal Error	Status
	Low	-	-	-	-	-	÷ .	-
NO _X	Mid	-	-	Ŧ	-	-	-	-
	High	-	-		-	-	-	-
	Low	-	-	-	-	-	-	-
SO ₂	Mid	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-
	Low	-	-	-	-	-	-	-
со	Mid	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-
	Low	0	03/04/29	SG9182147BAL	0.04	0.04	0.22	Pass
CO2	Mid	8.795	09/25/28	CC432856	9.04	0.24	1.37	Pass
	High	17.84	04/30/27	CC346448	17.93	0.09	0.50	Pass
	Low	0	03/04/29	SG9182147BAL	0.09	0.09	0.41	Pass
O ₂	Mid	10.19	09/25/28	CC432856	10.29	0.10	0.45	Pass
	High	22.17	04/30/27	CC346448	22.28	0.11	0.50	Pass



Instrumental Reference Method Field Data

Project Number:	437378	Start Date:	6/9/2021
Customer:	Primary Energy	End Date:	6/9/2021
Unit Identification:	HRCC	Facility:	Cokenergy Facility
Sample Location:	Stack 201	Recorded by:	Ben Cacao
Load Level/Condition:	> 50% Load	Fc Factor.	_
		Fd Factor:	

	Test Pa	rameter	T	NOx	SO ₂	CO	CO ₂	0 ₂	Volumotrio	
Calibration Span, CS (Day 1)			-	17.84 22.17				Volumetric Flow Rate	Moisture Fraction	
С	alibration Spa	an, CS (Day 2	2)	-	-	-	-	-	Flow Rate Fraction	
Run No.	Start Date	First Minute	Last Minute	Run Average Raw Analyzer Responses					DSCFM	Bws
1	6/9/21	7:38	9:23	-	-	-	6.33	12.02	-	-
2	6/9/21	9:51	11:36	-	-	-	5.87	12.41	-	-
3	6/9/21	12:00	13:45	-	-	-	5.69	12.68	-	-

	Actual Concentration of the Upscale Calibration Gas, C _{MA}										
	NO _X	SO ₂	CO	CO ₂	0 ₂						
C _{MA} (Day 1)	a.	-	-	8.795	10.19						
C _{ttA} (Day 2)	-	-	-								

System Responses to Zero Calibration Gas											
Run No.	N	NO _X		SO ₂		СО		CO ₂		0 ₂	
Rustino.	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
1	-	-	-	-	-	-	0.04	0.05	0.17	0.19	
2	-	-	-	-	-	-	0.05	0.05	0.19	0.19	
3	-	-	-	-	-	-	0.05	0.04	0.19	0.17	

System Responses to Upscale Calibration Gas											
Run No.	NO _X		S	SO ₂		со		CO2		O ₂	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
1	-	-	-	-	-	-	9.04	8.95	10.24	10.26	
2	-	-	-	-	-	-	8.95	8.82	10.26	10.26	
3	-	-	-	-	-		8.82	8.78	10.26	10.24	



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Instrumental Reference Method Calibration Data

437378	Start Date:	6/9/2021
Primary Energy	End Date:	6/9/2021
HRCC	Facility:	Cokenergy Facility
Stack 201	- Recorded by:	Ben Cacao
	Primary Energy HRCC	Primary Energy End Date: HRCC Facility:

CO2 System Bias/Calibration Error and Drift Summary

		Span	Cdir	Initial	Values	Final	√alues	Drift
Run #	Calibration Gas	Span Gas	Direct Cal	System	System	System	System	(% of span)
	Level	Concentration	Response	Response	Bias	Response	Bias	
		(%vol)	(%vol)	(%vol)	(% of span)	(%vol)	(% of span)	
1	Low Level Gas	17.84	0.04	0.04	0.0	0.05	0.1	0.1
	Upscale Gas	17.84	9.04	9.04	0.0	8.95	-0.5	0.5
2	Low Level Gas	17.84	0.04	0.05	0.1	0.05	0.1	0.0
	Upscale Gas	17.84	9.04	8.95	-0.5	8.82	-1.2	0.7
3	Low Level Gas	17.84	0.04	0.05	0.1	0.04	0.0	0.1
	Upscale Gas	17.84	9.04	8.82	-1.2	8.78	-1.5	0.2

O2 System Bias/Calibration Error and Drift Summary

		Span	Cdir	Initial	Values	Final '	√alues	Drift
Run #	Calibration Gas	Span Gas	Direct Cal	System	System	System	System	(% of span)
	Level	Concentration	Response	Response	Bias	Response	Bias	
		(%voł)	(ppm)	(%vol)	(% of span)	(%vol)	(% of span)	
1	Low Level Gas	22.17	0.09	0.17	0.4	0.19	0.5	0.1
	Upscale Gas	22.17	10.29	10.24	-0.2	10.26	-0.1	0.1
2	Low Level Gas	22.17	0.09	0.19	0.5	0.19	0.5	0.0
	Upscale Gas	22.17	10.29	10.26	-0.1	10.26	-0.1	0.0
3	Low Level Gas	22.17	0.09	0.19	0.5	0.17	0.4	0.1
	Upscale Gas	22.17	10.29	10.26	-0.1	10.24	-0.2	0.1



Instrumental Reference Method Calibration Corrected Test Data

Project Number:	437378	Start Date:	6/9/2021
Customer:	Primary Energy	End Date:	6/9/2021
Unit Identification:	HRCC	• Facility:	Cokenergy Facility
Sample Location:	Stack 201	Recorded by:	Ben Cacao
RM Probe Type:	Extractive (Dry)	Fc Factor:	-
Load Level/Condition:	> 50% Load	Fd Factor:	

Reference Method Results, As Measured Moisture Basis

Run	Ï	Start	End	NOX	SO2	CO	CO2	02
#	Date	Time	Time	ppmvd	ppmvd	ppmvd	% v/v dry	% v/v dry
1	6/9/21	7:38	9:23	-	-	-	6.2	12.0
2	6/9/21	9:51	11:36	-	-	-	5.8	12.4
3	6/9/21	12:00	13:45	-	-	-	5.7	12.6

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Date/Time 6/9/2021 6:59	CO2 %dry 0.05	O2 %dry 0.09
6/9/2021 7:00	0.04	0.09
6/9/2021 7:01	2.77	3.31
6/9/2021 7:02	17.82	22.20
6/9/2021 7:03	17.91	22.28
6/9/2021 7:04	17.93	22.28
6/9/2021 7:05	12.84	15.63
6/9/2021 7:06	9.03	10.29
6/9/2021 7:07	9.04	10.29
6/9/2021 7:08	9.12	10.44

TRC Report 437378 B

Pre Run 1 / Response Time

Date/Time	CO2 %dry	O2 %dry	
6/9/2021 7:22	0.05	0.17	
6/9/2021 7:23	0.04	0.17	1
6/9/2021 7:24	2.09	2.41	UpScale
6/9/2021 7:25	9.12	10.23	
6/9/2021 7:26	9.04	10.24	
6/9/2021 7:27	9.04	10.24	•
6/9/2021 7:28	7.22	8.13	DownScale
6/9/2021 7:29	0.10	0.20	
6/9/2021 7:30	0.06	0.17	-

Post Run 1

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Date/Time 6/9/2021 9:30	CO2 %dry 0.06	O2 %dry 0.19
6/9/2021 9:31	0.05	0.19
6/9/2021 9:32	6.29	7.33
6/9/2021 9:33	8.94	10.26
6/9/2021 9:34	8.95	10.26
6/9/2021 9:35	8.94	10.26

Post Run 2

Date/Time 6/9/2021 11:42	CO2 %dry	O2 %dry
	0.06	0.19
6/9/2021 11:43 6/9/2021 11:44	0.05	0.19
6/9/2021 11:44	5.54 8.80	6.59 10.25
6/9/2021 11:46	8.82	10.25
6/9/2021 11:47	<u> </u>	10.26
0/9/202111.4/	0.02	10.26

Post Run 3

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Date/Time	CO2 %dry	O2 %dry
6/9/2021 13:51	0.05	0.18
6/9/2021 13:52	0.04	0.17
6/9/2021 13:53	5.37	6.49
6/9/2021 13:54	8.76	10.24
6/9/2021 13:55	8.78	10.24
6/9/2021 13:56	8.78	10.25

Run 1

Dete/Time		00.0/
Date/Time	CO2 %dry	O2 %dry
6/9/2021 7:38	6.09	11.94
6/9/2021 7:39	6.12	11.92
6/9/2021 7:40	6.10	11.94
6/9/2021 7:41	6.12	11.92
6/9/2021 7:42	6.14	11.92
6/9/2021 7:43	6.16	11.91
6/9/2021 7:44	6.14	11.92
6/9/2021 7:45	6.15	11.92
6/9/2021 7:46	6.16	11.90
6/9/2021 7:47	6.17	11.94
6/9/2021 7:48	6.20	11.91
6/9/2021 7:49	6.23	11.92
6/9/2021 7:50	6.25	11.93
6/9/2021 7:51	6.27	11.90
6/9/2021 7:52	6.26	11.92
6/9/2021 7:53	6.27	11.93
6/9/2021 7:54	6.33	11.90
6/9/2021 7:55	6.30	11.89
6/9/2021 7:56	6.33	11.91
6/9/2021 7:57	6.63	11.93
6/9/2021 7:58	6.80	11.92
6/9/2021 7:59	6.66	11.92
6/9/2021 8:00	6.58	11.91
6/9/2021 8:01	6.52	11.95
6/9/2021 8:02	6.52	11.94
6/9/2021 8:03	6.50	11.96
6/9/2021 8:04	6.51	11.94
6/9/2021 8:05	6.50	11.97
6/9/2021 8:06	6.51	11.96
6/9/2021 8:07	6.49	11.96
6/9/2021 8:08	6.48	11.95
6/9/2021 8:09	6.47	11.96
6/9/2021 8:10	6.46	11.96
6/9/2021 8:11	6.46	11.97
6/9/2021 8:12	6.46	11.97
6/9/2021 8:13	6.45	11.98
6/9/2021 8:14	6.45	11.98
6/9/2021 8:15	6.44	11.99
6/9/2021 8:16	6.44	11.99
6/9/2021 8:17	6.43	12.00
6/9/2021 8:18	6.42	12.01
6/9/2021 8:19	6.42	12.01
6/9/2021 8:20	6.42	12.01
6/9/2021 8:21	6.41	12.02
6/9/2021 8:22	6.41	12.01
6/9/2021 8:23 6/9/2021 8:24	6.40	12.02
	6.38	12.06
6/9/2021 8:25 6/9/2021 8:26	6.37 6.36	12.08
019120210120	6.36	12.08

Run 1

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Date/Time	CO2 %dry	O2 %dry
6/9/2021 8:27	6.36	12.09
6/9/2021 8:28	6.36	12.00
6/9/2021 8:29	6.36	12.00
6/9/2021 8:30	6.36	12.07
		12.00
6/9/2021 8:31	6.36	
6/9/2021 8:32	6.34	12.10
6/9/2021 8:33	6.35	12.09
6/9/2021 8:34	6.35	12.09
6/9/2021 8:35	6.35	12.09
6/9/2021 8:36	6.37	12.08
6/9/2021 8:37	6.36	12.08
6/9/2021 8:38	6.36	12.08
6/9/2021 8:39	6.36	12.08
6/9/2021 8:40	6.36	12.08
6/9/2021 8:41	6.34	12.10
6/9/2021 8:42	6.34	12.10
6/9/2021 8:43	6.32	12.13
6/9/2021 8:44	6.33	12.12
6/9/2021 8:45	6.32	12.12
6/9/2021 8:46	6.34	12.10
6/9/2021 8:47	6.33	12.10
6/9/2021 8:48	6.34	12.09
6/9/2021 8:49	6.34	12.09
6/9/2021 8:50	6.34	12.10
6/9/2021 8:51	6.35	12.08
6/9/2021 8:52	6.37	12.06
6/9/2021 8:53	6.37	12.05
6/9/2021 8:54	6.36	12.05
6/9/2021 8:55	6.36	12.06
6/9/2021 8:56	6.36	12.06
6/9/2021 8:57	6.35	12.07
6/9/2021 8:58	6.36	12.06
6/9/2021 8:59	6.38	12.03
6/9/2021 9:00	6.37	12.05
6/9/2021 9:01	6.36	12.06
6/9/2021 9:02	6.36	12.06
6/9/2021 9:03	6.36	12.06
6/9/2021 9:04	6.36	12.06
6/9/2021 9:05	6.36	12.06
6/9/2021 9:06	6.39	12.06
6/9/2021 9:07	6.28	12.03
6/9/2021 9:08	6.41	12.00
6/9/2021 9:09	6.16	12.05
6/9/2021 9:10	6.17	12.05
6/9/2021 9:11	6.16	12.05
6/9/2021 9:12	6.15	12.05
6/9/2021 9:12	6.15	12.06
6/9/2021 9:13	6.16	12.00
6/9/2021 9:14	6.18	12.03
01012021 0.10	0.10	14.74

Run 1

Date/Time	CO2 %dry	O2 %dry
6/9/2021 9:16	6.17	12.04
6/9/2021 9:17	6.17	12.04
6/9/2021 9:18	6.16	12.04
6/9/2021 9:19	6.16	12.05
6/9/2021 9:20	6.18	12.03
6/9/2021 9:21	6.17	12.04
6/9/2021 9:22	6.15	12.06
6/9/2021 9:23	6.16	12.06
Average	6.33	12.02

Run 2

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Date/Time		00.9/
6/9/2021 9:51	CO2 %dry 6.05	O2 %dry
6/9/2021 9:52	6.03	12.16
6/9/2021 9:53	6.05	12.18
6/9/2021 9:54	6.05	12.15
6/9/2021 9:55	6.05	12.15
6/9/2021 9:56		12.15
6/9/2021 9:57	6.04	12.17
6/9/2021 9:58	6.04	12.16
6/9/2021 9:59	6.03	12.17
6/9/2021 10:00	6.02	12.19
6/9/2021 10:00	6.01	12.20
6/9/2021 10:01	6.01	12.19
	6.00	12.22
6/9/2021 10:03 6/9/2021 10:04	6.00	12.22
	6.00	12.21
6/9/2021 10:05	6.01	12.21
6/9/2021 10:06	6.01	12.21
6/9/2021 10:07	5.98	12.24
6/9/2021 10:08	6.00	12.23
6/9/2021 10:09	5.99	12.24
6/9/2021 10:10	5.98	12.25
6/9/2021 10:11	5.97	12.26
6/9/2021 10:12	5.99	12.22
6/9/2021 10:13	5.99	12.23
6/9/2021 10:14	5.98	12.24
6/9/2021 10:15	5.98	12.24
6/9/2021 10:16	5.96	12.27
6/9/2021 10:17	5.97	12.27
6/9/2021 10:18	5.95	12.28
6/9/2021 10:19	5.95	12.29
6/9/2021 10:20 6/9/2021 10:21	5.91	12.34
6/9/2021 10:21	5.92	12.33
6/9/2021 10:22	5.91	12.35
6/9/2021 10:23	5.93	12.32
	5.93	12.31
6/9/2021 10:25	5.91	12.34
6/9/2021 10:26	5.92	12.34
6/9/2021 10:27	5.92	12.32
6/9/2021 10:28	5.92	12.32
6/9/2021 10:29	5.92	12.33
6/9/2021 10:30	5.92	12.35
6/9/2021 10:31	5.92	12.33
6/9/2021 10:32 6/9/2021 10:33	5.91	12.34
6/9/2021 10:33	5.90	12.36
6/9/2021 10:34 6/9/2021 10:35	5.90 5.00	12.36
6/9/2021 10:35	5.90	12.37
6/9/2021 10:36	5.89 5.80	12.37
6/9/2021 10:37	5.89	12.37
6/9/2021 10:38	5.89 5.01	12.38
01012021 10.09	5.91	12.34

Run 2

Date/Time	CO2 %dry	O2 %dry
6/9/2021 10:40	5.90	12.36
6/9/2021 10:41	5.88	12.30
6/9/2021 10:42	5.90	12.33
6/9/2021 10:43	5.88	12.39
6/9/2021 10:44	5.89	12.39
6/9/2021 10:45	5.88	12.39
6/9/2021 10:46	5.88	12.39
6/9/2021 10:47	5.88	12.39
6/9/2021 10:48	5.88	12.38
6/9/2021 10:49	5.87	12.00
6/9/2021 10:50	5.87	12.40
6/9/2021 10:51	5.87	12.41
6/9/2021 10:52	5.86	12.43
6/9/2021 10:53	5.87	12.41
6/9/2021 10:54	5.85	12.44
6/9/2021 10:55	5.86	12.42
6/9/2021 10:56	5.86	12.44
6/9/2021 10:57	5.86	12.42
6/9/2021 10:58	5.86	12.42
6/9/2021 10:59	5.86	12.43
6/9/2021 11:00	5.87	12.42
6/9/2021 11:01	5.84	12.44
6/9/2021 11:02	5.85	12.43
6/9/2021 11:03	5.84	12.44
6/9/2021 11:04	5.85	12.42
6/9/2021 11:05	5.86	12.42
6/9/2021 11:06	5.84	12.44
6/9/2021 11:07	5.85	12.44
6/9/2021 11:08	5.82	12.47
6/9/2021 11:09	5.82	12.46
6/9/2021 11:10	5.83	12.46
6/9/2021 11:11	5.83	12.46
6/9/2021 11:12	5.78	12.53
6/9/2021 11:13	5.72	12.62
6/9/2021 11:14	5.72	12.63
6/9/2021 11:15	5.70	12.67
6/9/2021 11:16	5.69	12.69
6/9/2021 11:17	5.69	12.68
6/9/2021 11:18	5.68	12.70
6/9/2021 11:19	5.69	12.70
6/9/2021 11:20	5.68	12.71
6/9/2021 11:21	5.69	12.70
6/9/2021 11:22	5.69	12.70
6/9/2021 11:23	5.67	12.71
6/9/2021 11:24 6/9/2021 11:25	5.66 5.67	12.74
6/9/2021 11:25	5.67	12.74 12.71
6/9/2021 11:26	5.68 5.67	12.71
6/9/2021 11:27		12.73
0131202111.20	5.66	12.74

Run 2

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Date/Time	CO2 %dry	O2 %dry
6/9/2021 11:29	5.67	12.73
6/9/2021 11:30	5.69	12.71
6/9/2021 11:31	5.68	12.72
6/9/2021 11:32	5.67	12.73
6/9/2021 11:33	5.67	12.72
6/9/2021 11:34	5.67	12.72
6/9/2021 11:35	5.67	12.72
6/9/2021 11:36	5.67	12.73
Average	5.87	12.41

Run 3

Date/Time	CO2 %dry	O2 %dry
6/9/2021 12:00	5.74	12.59
6/9/2021 12:01	5.75	12.59
6/9/2021 12:02	5.73	12.60
6/9/2021 12:03	5.74	12.59
6/9/2021 12:04	5.75	12.59
6/9/2021 12:05	5.74	12.59
6/9/2021 12:06	5.73	12.61
6/9/2021 12:07	5.73	12.61
6/9/2021 12:08	5.75	12.58
6/9/2021 12:09	5.74	12.60
6/9/2021 12:10	5.73	12.60
6/9/2021 12:11	5.73	12.61
6/9/2021 12:12	5.73	12.61
6/9/2021 12:13	5.72	12.62
6/9/2021 12:14	5.71	12.64
6/9/2021 12:15	5.71	12.64
6/9/2021 12:16	5.72	12.62
6/9/2021 12:17	5.72	12.63
6/9/2021 12:18	5.73	12.61
6/9/2021 12:19	5.71	12.64
6/9/2021 12:20	5.70	12.65
6/9/2021 12:21	5.72	12.63
6/9/2021 12:22	5.74	12.59
6/9/2021 12:23	5.72	12.62
6/9/2021 12:24	5.71	12.64
6/9/2021 12:25	5.73	12.61
6/9/2021 12:26	5.71	12.64
6/9/2021 12:27	5.72	12.62
6/9/2021 12:28	5.72	12.63
6/9/2021 12:29	5.72	12.63
6/9/2021 12:30	5.71	12.64
6/9/2021 12:31	5.69	12.66
6/9/2021 12:32	5.69	12.66
6/9/2021 12:33	5.69	12.67
6/9/2021 12:34	5.69	12.67
6/9/2021 12:35	5.69	12.66
6/9/2021 12:36	5.69	12.68
6/9/2021 12:37	5.70	12.67
6/9/2021 12:38	5.70	12.66
6/9/2021 12:39	5.72	12.62
6/9/2021 12:40	5.72	12.63
6/9/2021 12:41	5.70	12.66
6/9/2021 12:42	5.71	12.64
6/9/2021 12:43	5.72	12.64
6/9/2021 12:44	5.71	12.64
6/9/2021 12:45	5.72	12.64
6/9/2021 12:46	5.70	12.66
6/9/2021 12:47	5.70	12.66
6/9/2021 12:48	5.71	12.65

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Date/Time	CO2 %dry	O2 %dry
6/9/2021 12:49	5.70	12.67
6/9/2021 12:50	5.70	12.68
6/9/2021 12:51		
	5.69	12.69
6/9/2021 12:52	5.69	12.68
6/9/2021 12:53	5.69	12.66
6/9/2021 12:54	5.69	12.67
6/9/2021 12:55	5.69	12.67
6/9/2021 12:56	5.70	12.65
6/9/2021 12:57	5.68	12.68
6/9/2021 12:58	5.68	12.68
6/9/2021 12:59	5.69	12.67
6/9/2021 13:00	5.69	12.67
6/9/2021 13:01	5.69	12.68
6/9/2021 13:02	5.69	12.68
6/9/2021 13:03	5.67	12.69
6/9/2021 13:04	5.67	12.69
6/9/2021 13:05	5.67	12.71
6/9/2021 13:06	5.67	12.69
6/9/2021 13:07	5.66	12.71
6/9/2021 13:08	5.67	12.71
6/9/2021 13:09	5.66	12.71
6/9/2021 13:10	5.67	12.71
6/9/2021 13:11	5.67	12.72
6/9/2021 13:12	5.67	12.71
6/9/2021 13:13	5.67	12.71
6/9/2021 13:14	5.65	12.73
6/9/2021 13:15	5.67	12.71
6/9/2021 13:16	5.64	12.73
6/9/2021 13:17	5.66	12.71
6/9/2021 13:18	5.64	12.74
6/9/2021 13:19	5.64	12.74
6/9/2021 13:20	5.65	12.73
6/9/2021 13:21	5.64	12.74
6/9/2021 13:22	5.64	12.74
6/9/2021 13:23	5.64	12.74
6/9/2021 13:24	5.64	12.74
6/9/2021 13:25	5.63	12.78
6/9/2021 13:26	5.64	12.75
6/9/2021 13:27	5.64	12.75
6/9/2021 13:28	5.65	12.76
6/9/2021 13:29	5.65	
6/9/2021 13:30	5.65	12.75
6/9/2021 13:31	5.64	12.75
6/9/2021 13:31		12.76
6/9/2021 13:32	5.65	12.75
6/9/2021 13:33	5.64	12.76
6/9/2021 13:35	5.64	12.76
6/9/2021 13:35	5.65	12.74
	5.64	12.76
6/9/2021 13:37	5.63	12.76

TRC Report 437378 B

Primary Energy Cokenergy Facility HRCC Stack 201

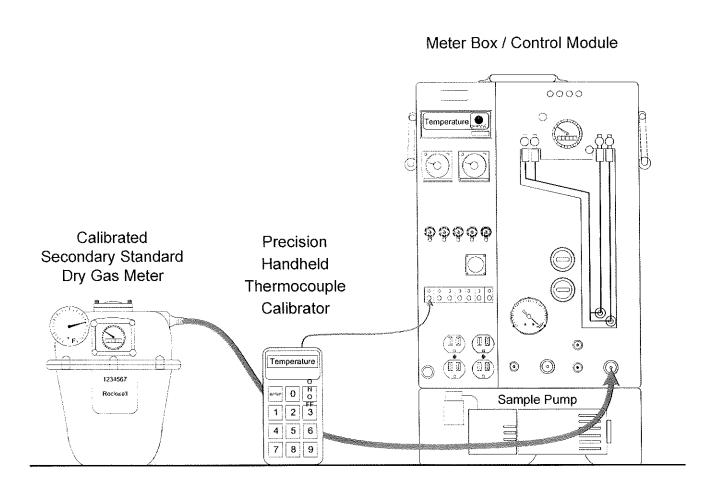
Run 3

Date/Time	CO2 %dry	O2 %dry
6/9/2021 13:38	5.63	12.76
6/9/2021 13:39	5.62	12.78
6/9/2021 13:40	5.62	12.78
6/9/2021 13:41	5.63	12.78
6/9/2021 13:42	5.62	12.79
6/9/2021 13:43	5.63	12.79
6/9/2021 13:44	5.62	12.79
6/9/2021 13:45	5.63	12.78
Average	5.69	12.68



Equipment Configuration for Meter Box Calibration

USEPA Promulgated Method 5



♦ TRC

Pre Test DGM Calibration

(before use, as left data)

TRC Report 437378 B

Control Module I Standard Meter Standard Meter	I.D. No.:	E33 3623853 0.9972	-	System Leak Chec Standard Meter Ca Standard Meter Ca	libration Date:	Passed @ > 8 8-22-2018 8-22-2019	' w.c. @ > 5 min. - -	Date: Calibrated By: Barometric Pres	sure :		04-30-2019 L. campo 29.38	-	
Run Number	Orifice Setting in.H ₂ 0	Meter Pressure in.H ₂ 0	Standard Meter Volume Vr	Control Module DGM Volume Vd	Standard Meter Temp. F Tr		Dry Gas Meter Outlet Temp. F Tdo	Dry Gas Meter Avg. Temp. F Td	Time Min.	Time Sec.		Pressure equal to: 0.75 cfm @ STP (DH@)	Flow Rat (Q) scfm
nitial			829.438	545.853	72	73	79	1	<u></u>			<u> </u>	
inal			838.046	554,530	72		· · ·	1					
ifference 1	0.35	0.35	8,608	8,677	72	1		1	25	5	0.990	1.712	0.34
itial			818.524	534,897	72	1	1			`		1.7.74	0.01
nal			829.154	545.565	72	73		1					
ifference 2	0.85	0.85	10.630	10.668	72	73	73	73	20	12	0.992	1.770	0.52
itial			838,286	554.765	72	73	73						
nal			849.935	566.460	72	73	73						
ifference 3	2.00	2,00	11.649	11.695	72	73	73	73	15	2	0.990	1.919	0.76
Jillefence 3	.1_2.00	2.00	11.649	17.695 [1 73	173	Pre Test Calib			0.990	1.919	0,7

Specifications: CFR 40, Part 60, Appendix A, Method 5, section 10,3,1. Calibration Before Use.



Pre Test Temperature Indicator Calibration

(For K-Type Thermocouples)

Date: 04-30-2019

Name: L. campo

Control Module Number: E33

Ambient Temperature: 72 °F

Reference std. thermocouple calibrator: Omega Engineering, Inc. Model No. CL23A *Reference std. thermocouple calibrator serial number:T-236796Date of reference std. calibration verification:5/31/2018Due date of reference std. calibration verification:5/31/2019

Reference Thermometer (°F)	Thermometer Under Test (°F)	Temperature Difference (%)
0	0	0.0
600	600	0.0
1200	1200	0.0

 $\frac{\text{Temperature}}{\text{Difference, \%}} = \frac{\text{Pef. std. temp. (°F + 460)} - \text{Therm. under test temp. (°F + 460)}}{\text{Peference std temp. (°F + 460)}} \times 100 \leq 1.5\%$

* Reference std. is directly traceable to NIST (National Institute of Standards and Technology)



Post Meter Calibration Verification

Project Number:	437378
Last Test Run:	6/9/2021
Operator(s):	Ryan Novosel

	Run 1	Run 2	Run 3	Average
Console/Meter ID:	E33	E33	E33	
Run Time (min):	96	96	96	
V _m (cf):	60.325	62.715	61.883	
T _m (°R):	546.65	547.36	547.15	N1/A
P _{bar} ("H _g):	29.11	29.14	29.11	N/A
DH _{avg} ("H ₂ O):	1.21	1.23	1.21	
M _d :	29.47	29.42	29.42	
Orifice ∆H _{@I} :	1.801	1.801	1.801	
Meter Y _i :	0.991	0.991	0.991	0.991
Y _{qa} .	0.999	0.972	0.975	0.982

Difference between average Y_{qa} and $Y_{i^{\rm c}}$ 0.9%

Calibration Status: Pass

 $\label{eq:specification: USEPA Method 5, Section 16.3, \textit{Alternative Post-Test Metering System Calibration} \\ The average Y_{qa} must be within 5\% of Y_i$

Post Test Leak Checks				Specification:
Train Leak Check:	Pass	Pass	Pass	(≤ 0.020 CFM)
Pump/Orifice Leak Checl	Pass	Pass	Pass	(= 0" @ 5-7" H ₂ 0)

Field Calibration Tool Identification

Analyst:	Ryan Novosel
Date:	6/9/2021
Project Number:	437378
Client:	Primary Energy
Test Location:	HRCC Stack 201

Calibration Tools: Include all of the tools from the field calibration kit that you will be using on this project. (See SOP AM-CAL-025 for instructions on re-verification)

ltem	ID#	S/N	Calibration Due Date
Digital Caliper	FK005-DC005		9/5/2021
Thermometer	TH005	91221541	9/5/2021
Barometer	BA005	160874750	8/12/2021
Calibration Weight	W100-005	8140	9/5/2021
Calibration Weight A	W500-005	4593	9/5/2021
Calibration Weight B	W500/2-005	4594	9/5/2021
Type A Angle Finder	AF005		9/5/2021
Plastic/Magnetic Torpedo Level	TL005		

81

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Analyst:	Ryan Novosel
Date:	6/9/2021
Project Number:	437378
Client:	Primary Energy
Test Location:	HRCC Stack 201

Pre-Test Thermocouple Calibration Checks

(See SOP AM-CAL-005 for instructions)

Console/Meter Box ID #	E33
Probe ID#	727
Test Location/Measurement Point Info:	Stack
NIST Thermometer ID #	TH005

Procedure 1: Calibrate thermocouple against a reference thermometer.

After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer.

Procedure 2: Check the response of the thermocouple to a change in temperature.

Check the "continuity" of the thermocouple by subjecting it to a change in temperature (e.g., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections.

Measurement	T/C Temp, °F	NIST Thermometer Temp, °F	Difference, °F (± 2)	Continuity Check	Overall Status
Stack	81	81.4	0.4	Pass	Pass
Filter	82	82.9	0.9	Pass	Pass
Impinger Exit	82	83	1.0	Pass	Pass
Meter in	81	81.7	0.7	Pass	Pass
Meter Out	81	81.4	0.4	Pass	Pass
Probe	81	81.9	0.9	Pass	Pass
Other					
Other					

Notes:

Analyst:	Ryan Novosel
Date:	6/9/2021
Project Number:	437378
Client:	Primary Energy
Test Location:	HRCC Stack 201

Post-Test Thermocouple Calibration Checks

(See SOP AM-CAL-005 for instructions)

Console/Meter Box ID #	E33
Probe ID#	727
Test Location/Measurement Point Info:	Stack
NIST Thermometer ID #	TH005

Procedure 1: Calibrate thermocouple against a reference thermometer.

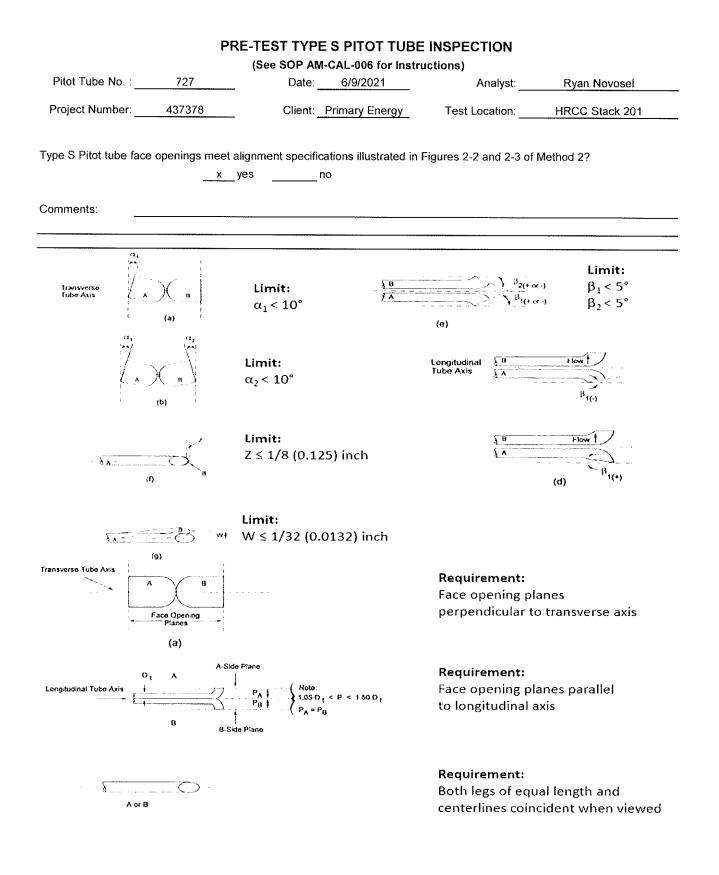
After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer.

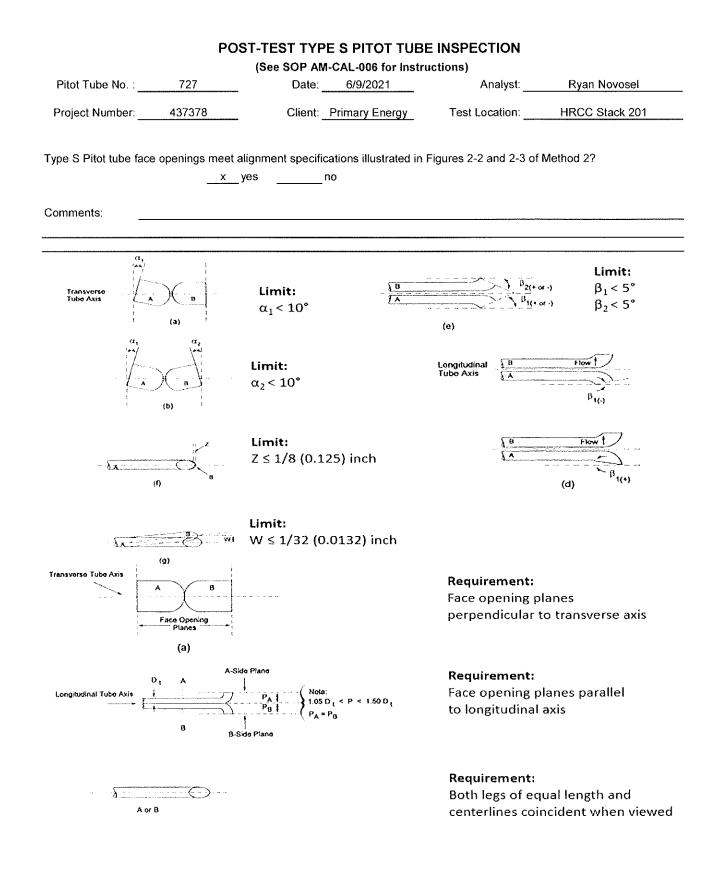
Procedure 2: Check the response of the thermocouple to a change in temperature.

Check the "continuity" of the thermocouple by subjecting it to a change in temperature (e.g., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections.

Measurement	T/C Temp, °F	NIST Thermometer Temp, °F	Difference, °F (± 2)	Continuity Check	Overall Status
Stack	88	89	1.0	Pass	Pass
Filter	88	89	1.0	Pass	Pass
Impinger Exit	89	89.5	0.5	Pass	Pass
Meter in	89	89.4	0.4	Pass	Pass
Meter Out	89	89.3	0.3	Pass	Pass
Probe	88	88.6	0.6	Pass	Pass
Other					
Other					

Notes:

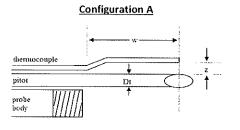


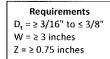


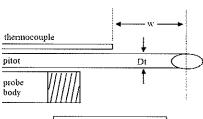
PRE-TEST PITOT TUBE ASSEMBLY INSPECTION

Analyst:	Ryan Novosel	
Date:	6/9/2021	
Project Number:	437378	
Test Location:	HRCC Stack 201	
EPA Probe Configuration:	Method 5	

Pitot Assembly Intercomponent Spacings Meet Requirements (See SOP AM-CAL-006 for Instructions)





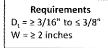


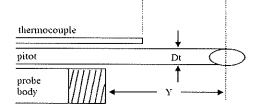
Yes

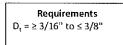
Configuration B

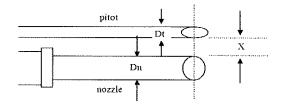
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No



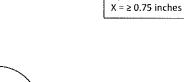


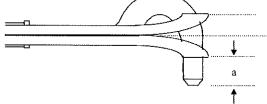




Requirements

 $D_t = \ge 3/16^{"}$ to $\le 3/8^{"}$



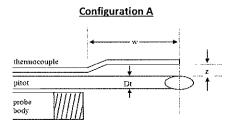


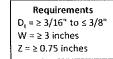


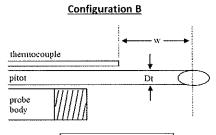
POST-TEST PITOT TUBE ASSEMBLY INSPECTION

Analyst:	Ryan Novosel
Date:	6/9/2021
Project Number:	437378
Test Location:	HRCC Stack 201
EPA Probe Configuration:	Method 5

Pitot Assembly Intercomponent Spacings Meet Requirements (See SOP AM-CAL-006 for Instructions)



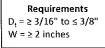


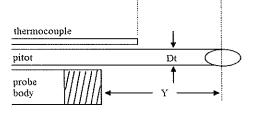


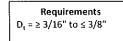
Yes

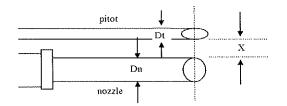
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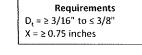
No

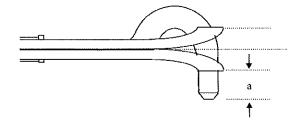














Top Loading Field Balance Check

Analyst:

Client:

Project Number:

Ryan Novosel 437378 Primary Energy HRCC Stack 201

Test Location:

(See SOP AM-CAL-009 for instructions)

Type of Scale	Lab Top-loading Scale
Scale ID#	P1821017
	Tolerance (g) = +/-

се	(g)	-	+/-	0.5
----	-----	---	-----	-----

Date	Reference Weight Serial Number	Nominal Weight Value* (g)	Weight Found (g)	Difference	Pass
6/9/21	4593	500.0	500.0	0.0	YES

*Weight (ASTM Class 6 or better) must be at least 500 g or within 50 g of loaded impinger.

Barometric Pressure Determination

Analyst:	Ryan Novosel
Date:	6/9/2021
Project Number:	437378
Client:	Primary Energy
Test Location:	HRCC Stack 201

Procedure: Use a NIST traceable field barometer for all field measurements. Bring the field barometer to the test location and allow 15 minutes for the instrument to stabilize prior to recording readings.

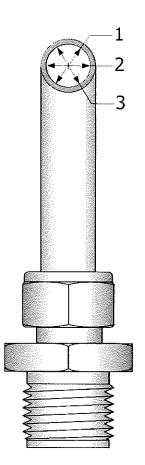
Date:	6/9/2021
Barometer Serial Number:	160874750
Barometer Pressure Prior to Testing:	29.11
Barometer Pressure After Testing:	29.11
Average Barometric Pressure:	29.11

Add reading? No

Nozzle Calibration

Analyst:	Ryan Novosel
Date:	6/9/2021
Project Number:	437378
Client:	Primary Energy
Test Location:	HRCC Stack 201

(See SOP AM-CAL-007 for Instructions)



Nozzle ID No.: 0.205

Maximum - Minimum ≤ 0.004 inches

Pre Test

0.205 1

0.205 2

0.206 3

PASS - measurements meet specifications.

Average	
<u>0.205</u>	



Response Time Verification

Project Number:	437378	Test Date:	6/9/2021
Customer:	Primary Energy	Facility:	Cokenergy Facility
Unit Identification:	HRCC	Recorded By:	Ben Cacao
Sample Location:	Stack 201		

	Upscale Response Check						
	Cal Gas	Cal Gas	Start	Stable	Upscale Target	Time at	Response
Pollutant	Level	Conc.	Time	Response	Response	Target	Time
NO _X	-	-	-	-	-	-	-
SO ₂	-	-	-	-	-	-	-
CO	-	-	-	-	-	-	-
CO ₂	Mid	8.80	7:24:00	9.04	8.59	7:25:00	0:01:00
O ₂	Mid	10.19	7:24:00	10.24	9.73	7:25:00	0:01:00

Target Response is 95% of the Pre 1 System Response from the Upscale Bias Test

Start time is the time at which gas is introduced upstream of the probe.

Time at target is the time at which the required target response is achieved.

Response time is the difference between the two.

	Downscale Response Check									
	Cal Gas Cal Gas Start Downscale Time at Response									
Pollutant	Level	Conc.	Time	Target Response	Target	Time				
NO _X		-	-	-	-	-				
SO ₂	-	-	-	-	-	-				
со	-	-	-	-	-	-				
CO ₂	Mid	8.80	7:28:00	0.44	7:29:00	0:01:00				
O ₂	Mid	10.19	7:28:00	0.51	7:29:00	0:01:00				

Target Response is 0.5 ppm or 5.0 percent of the upscale gas concentration (whichever is less restrictive)

System Response Times				
	Response			
Pollutant	Time			
NO _X	0:00:00			
SO ₂	0:00:00			
со	0:00:00			
CO2	0:01:00			
O ₂	0:01:00			

System response is the longer of the responses to zero and upscale gas.

ANALYZER INTERFERENCE RESPONSE TEST

USEPA Reference Method: <u>3A</u>	Analyzer Type:CO2
Analyzer Manufacturer: Servomex	Model Number:1440
Analyzer Span: <u>0-20%</u>	
Test Performed by: <u>D. Grabowski</u>	Date: <u>1/23/1998</u>
r	

		Affect of Interference Gas on Analyzer	
Interference Gas	Interference Gas Concentration	Analyzer Response, ppm	Percent of Span
NOx	498.0 ppm	-0.02	-0.10
SO ₂	208.9 ppm	-0.02	-0.10
СО	450.7 ppm	-0.02	-0.10
CO2	10.06%		No we
O2	22.5%	-0.02	-0.10
	Total Response (sum)	-0.04	-0.40

Total affect on analyzer reading must be < 2% of analyzer span.

Detailed interference response test data is maintained on file and is available upon request.

ANALYZER INTERFERENCE RESPONSE TEST

USEPA Reference Method: <u>3A</u> Analyzer Type: <u>O2</u>

Analyzer Manufacturer: <u>Servomex</u> Model Number: <u>1440</u>

Analyzer Span: 0-25%

Test Performed by: D. Grabowski Date: 1/23/1998_

		Affect of Interference Gas on Analyzer		
Interference Gas	Interference Gas Concentration	Analyzer Response, ppm	Percent of Span	
NOx	498.0 ppm	0.02	0.08	
SO ₂	208.9 ppm	0.02	0.08	
со	450.7 ppm	0.00	0.00	
CO2	10.06%	0.00	0.00	
O2	22.5%			
	Total Response (sum)	0.04	0.16	

Total affect on analyzer reading must be < 2% of analyzer span.

Detailed interference response test data is maintained on file and is available upon request.



CERTIFICATE OF BATCH ANALYSIS Grade of Product: CEM-CAL ZERO

Part Number: Cylinder Analyzed: CC126284 Laboratory: Analysis Date: Lot Number:

NI CZ15A 192 - Elk Grove (SAP) - IL Mar 04, 2021 136-402054703-1

Reference Number: 136-402054703-1 Cylinder Volume: Cylinder Pressure: Valve Outlet:

142.0 CF 2000 PSIG 580

Expiration Date: Mar 04, 2029

ANALYTICAL RESULTS					
Component		Requested Purity		Certified Concentration	
NITROGEN		99.9995 %		99.9995 %	
CARBON DIOXIDE	<	1.0 PPM		0.14 PPM	
NOx	<	0.1 PPM	<	0.1 PPM	
SO2	<	0.1 PPM	<	0.1 PPM	
THC	<	0.1 PPM		0.076 PPM	
CARBON MONOXIDE	<	0.5 PPM	<ldl< td=""><td>0.04 PPM</td><td></td></ldl<>	0.04 PPM	

Permanent Notes: Airgas certifies that the contents of this cylinder meet the requirements of 40 CFR 72.2 Cylinders in Batch:

CC126284, CC235351, CC276618, CC313926, CC478855, SG9182147BAL

Impurities verified against analytical standards traceable to NIST by weight and/or analysis.



Airgas Specialty Gases Airgas USA, LLC 12722 S. Wentworth Ave. Chicago, IL 60628 Airgas.com

CERTIFICATE OF ANALYSIS Grade of Product: EPA Protocol

Part Number: Cylinder Number: Laboratory: PGVP Number: Gas Code: E03NI81E15A37P2 CC432856 124 - Chicago (SAP) - IL B12020 CO2,O2,BALN

Reference Number:5Cylinder Volume:1Cylinder Pressure:2Valve Outlet:5Certification Date:5ep 25, 2028

54-401917068-1 150.3 CF 2015 PSIG 590 Sep 25, 2020

Expiration Date: Sep 25, 2028

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This	Cylinder below	100 osia, j.e. 0.7	megapascals.

ANALYTICAL RESULTS						
Compon	ent	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON	DIOXIDE	9.000 %	8.795 %	G1	+/- 0.5% NIST Traceable	09/25/2020
OXYGEN		10.00 %	10.19 %	G1	+/- 0.7% NIST Traceable	09/25/2020
NITROGE	N	Balance				
CALIBRATION STANDARDS						
Туре	Lot ID	Cylinder No	Concentration		Uncertainty	Expiration Date
NTRM	08010526	K020991	4.954 % CARBON	I DIOXIDE/NITROGEN	+/- 0.5%	Dec 14, 2023
NTRM	98050916	SG9168259BAL	16.04 % OXYGEN	I/NITROGEN	+/- 0.6%	Oct 06, 2021
			ANALYTICAL	EQUIPMENT		
Instrume	ent/Make/Mod	lel	Analytical Prin	•	Last Multipoint Calib	ration
CO2-1 HC	RIBA VIA-510	V1E3H7P5	NDIR		Sep 24, 2020	
02-1 HOF	RIBA MPA-510 (3VUYL9NR	Paramagnetic		Sep 10, 2020	

Triad Data Available Upon Request





Airgas Specialty Gases Airgas USA, LLC 12722 S. Wentworth Ave. Chicago, IL 60628 Airgas.com

CERTIFICATE OF ANALYSIS Grade of Product: EPA Protocol

Part Number: Cylinder Number: Laboratory: PGVP Number: Gas Code:

E03NI60E15A1069 CC346448 124 - Chicago (SAP) - IL B12019 CO2,O2,BALN

Reference Number: 54-401484876-1 Cylinder Volume: Cylinder Pressure: Valve Outlet: Certification Date:

158.2 CF 2015 PSIG 590 Apr 30, 2019

Expiration Date: Apr 30, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

			ANALYTICA	L RESULTS		
Compon	ent	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON	DIOXIDE	18.00 %	17.84 %	G1	+/- 0.9% NIST Traceable	04/30/2019
OXYGEN NITROGE	N	22.00 % Balance	22.17 %	G1	+/- 0.7% NIST Traceable	04/30/2019
			CALIBRATION	STANDARD	S	
Туре	Lot ID	Cylinder No	Concentration		Uncertainty	Expiration Date
NTRM	13060817	CC416652	24.04 % CARBON D	OXIDE/NITROGEN	+/- 0.6%	May 16, 2019
NTRM	15010420	K027067	22.454 % OXYGEN/	NITROGEN	+/~ 0.2%	Aug 05, 2021
			ANALYTICAL	EQUIPMEN	Γ	
Instrume	nt/Make/Mod	el	Analytical Princ	iple	Last Multipoint Calil	oration
CO2-1 HO	RIBA VIA-510 V	/1E3H7P5	NDIR		Apr 27, 2019	
02-1 HOR	IBA MPA-510 3	VUYL9NR	Paramagnetic		Арг 25, 2019	

Triad Data Available Upon Request



🤣 TRC **Isokinetic Test Support Data** COKE EMERLY 7378 Company: Project#: Plant: EAST <HICAGO Test Method(s): HRC Unit ID: Test Run #: STAL Location: Test Date(s): -6-7 Normal Console Operator: Unit Operating Mode: 254.47 Console ID: Duct Shape/Area: Round ft² 1 Meter Y: dscf/MMBtu Factor: Orifice $\Delta H_{@i}$: scf/MMBtu F. Factor: хa Pitot Tube ID; F_w Factor: wscf/MMBtu Cal. coefficient (C_a): Fuel heat content: Btu / Probe Liner Material: Process/fuel flow rate: ' LASS Nozzle Material: Soot blown? N/A Fuel Type: Nozzle Diameter (D_n): N/A in Duration: min 392 Sample collection time Final wt: Tare wt. Total # of points: Imp # Contents (gramş) (grams) 727.0 Target Sample time/point: **8**82 1 0.1N HNO3 min 612.5 685.6 Target run duration: min 2 0.1N HNO3 643.8 3 Empty *\$*},∥ in Hg 730. 7485 Barometric Pressure (Phar): 4 Silica

Stack Static Pressure (Pg): Stack Pressure (Ps):

Leak Checks

Pre-Test Train Leak Check: Pre-Test Pitot Leak Check: Post-Test Train Leak Rate: Post-Test Pitot Leak Check: Pad (Pass or Fail) Pump/Orifice Leak Check: Filter/Thimble ID: Tare Weight:

004 CFM@Ko "Hg ATS (Pass or Fail) "Hg Pass or Fail)

grams

-), 2 in H2O

29,00 in Hg

	748.2 07/07/20 KEM
Net grams (M _{H20})	: <u>]],5</u>
Gas Molecular Weight Method:	07/07/2021 KEM
3A INSTRUMENTAL % CO2: 6.2	%vol dry
% O ₂ : <u>12</u>	%vol dry
% Nitrogen + % CO : 51.50	%voi dry
M_d - dry basis : 29,47	lb/lb-mole

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:



TRC Report 437378 B

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83 of 88

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Company: Column Plant: <u>FAST</u> Unit: <u>HR</u> Location: ST	ENERLY Zyward	Job #: Methods: 	4/37378 12 0f			Test Date: X-Factor: Minutes/pt:	6-9-21 1,480	
			·······			This data	not entered in Excel	
Port &	Meter		Ory Gas Meter	Orifice	Probe	Filter	Impinger Train	1

Port &		Meter		1	Dry G	as Meter	Orifice	Probe	Filter	Imping	er Train	Pump
Point	Clock	Volume	ΔΡ	Stack	Inlet	Outlet	ΔН	Liner	Outlet	Outlet	CPM Filter	Vacuum
D .	Time	ft ³	in. H₂O	°F	PF	°F	In. H ₂ O	°F	°F	۴		In. Hg
	732	762.5	1.2	270	84	84	1.3	261	260	57	NA	-4-
1 -	142	765.16	1.2	270	85	89	1.3	261	260	37	1_1_	•
2 -	746	767.73	1.2	271	85	84	1.7	262	260	57		-9
	750	770.28	1.2	2.71	86	85	1.3.	202	260	55 55		4
	754	773. 65	.92	276	56	85	1.0	262	260			4
3 7	158	775.27	.82	270	86	85	1.0	263	260	58		9
8	202	777.7						<u> </u>				
		777.7	1.2	271	86	86	13	262	260	18		9
1.8	209	750,22	1.2	271	87	SC	1.3	J62	259	59		4
		78-2.75	1.1	270	88	56	12	261	259	S		4
28		785,31		276	58 57 57	56	1.2	Yor	. ม7	59		9
3 8	21 -	787.55	1.0	276	88	87	1.1	261	259	60		4
3 80	25 -	790 32	10	270	81	87	1.1	261	260	60	i i	1
8	29 -	792.781		(~~		
3~1 8	32 7	792.75	1.2	171	78	87		261	260	61	1	-[
1 8		795.31	1.2	271	55	88	1.3 .	26	260	61	1 1	ł
2 51	Ya		1.2	271	83	88		261	259	61		f
J 84	14 8				87	F8		261	Xu	62		1
3 84		803 1	.0 .	271	58 25		1.1	261	260	60	19	
3 85	ン や	75.5	1.0	271	96	38	1.1	261	260	62	Ŭ.	
Fr	6 5	708										
-1 85	9	808	1.1 0	172	¥7	87 1	1.] 🗸	2(1)	0	63	- 4	,
1 903	3 5	10.52 1	· (]	271	27	87			91	6]	4	
2 90-	ק ר	17.98 1	.1 🤉	170	88 -	77	1.2 -	165 2	60	63	4	
2 91	1 8	15.42 1	, / 🔾 🤉	70	28	87 1			260 (<u>y</u>	4	
3 91	3 8	17.86 1		70	83 8	F7	1.3 2	161 a	60 6	,4	4	
3 9/3				27)	28 3		1.2 2	261 2	60 (4	<u> </u>	
923		22. 825	· · · · · · · · · · · · · · · · · · ·							~		
	<u></u>											
			f			·						{
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nments/notes:						·				7	AM-EM	-15 Rev. 4

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Console Operator:	RN		Unit Operating Mode:	Normal		
Console ID:	533		Duct Shape/Area:	Round	/ 254.47	ft²
Meter Y:	, 191		F _d Factor:		dscf/MMBtu	
Orifice ΔH _{@i} :	1,801		F _c Factor:		scf/MMBtu	
Pitot Tube ID:	727		F _w Factor:		wscf/MMBtu	
Cal. coefficient (C _o):	184		Fuel heat content:		Btu ,	1
Probe Liner Material:	6105		Process/fuel flow rate:			······
Nozzie Material:	51		Soot blown?	N/A	Fuel Type:	······································
Nozzle Diameter (D _n):	in		Duration:	N/A	min	**************************************
Sample collection time		·····	······································		Tare wt.	Final wt:
	12	lusu #	Contents			
Total # of points:		<u>Imp #</u>	0.1N HNO3	-	(grams) کرکرک	(grams)
Target Sample time/point:	- Min 	2	0.1N HNO3		Q	<u>x</u>
Target run duration:	<u>76</u> min				- <u>745.4</u>	$-\frac{16}{C/V}$
		3	Empty	<u></u>	562.4	- <u>567.6</u> -
Barometric Pressure (P _{bar}):	$\frac{1}{2}$ in Hg		Silica		_ 5KU.S_	812-4
Stack Static Pressure (Pg):	$\frac{1}{20}$ in H20		- <u></u>			
Stack Pressure (P _s):	29.95 in Hg			•		
Leak Checks			<u> </u>			
Pre-Test Train Leak Check:	. (X) CFM @ 15 "Hg				Net grams (M _{H20})	215-2
Pre-Test Pitot Leak Check:	Par (Pass or Fail)					
Post-Test Train Leak Rate:	. OUT CFM@15 "Hg	Gas M	olecular Weight Method	Ŀ		
Post-Test Pitot Leak Check		34	INSTRUMENT	N % C	D₂: 5,8	%voi dry
Pump/Orifice Leak Check:	Poss (Pass or Fail)			THE REAL PROPERTY AND A DESCRIPTION OF A	D2: 12.4	%vol dry
Filter/Thimble ID:	<u> </u>		% Nitr		:0: 51.50	%vol dry
Tare Weight:	grams			M _{rl} - dry bas		ib/lb-mole
	·····				<u> </u>	
Description of Filter and F	ront Half Rinses:	Descr	ription of Impinger liquid	d:		

General Comments:



Company Plant Unit Location	Coke Enst HR	ENERLY 21012260 222 TROCK		Job # Methods: Run #: averse Sheet:		7378 3 			Minutes/p	te: $6,9$ or: 1.95 ot: 4		
						محدد المراجعة المحرك من الم						
Port &		Meter				las Meter	Orifice				ger Train	Pump
Point	Glock	Volume	ΔΡ	Stack	Inlet	Outlet		Liner			CPM Filte	r Vacuum
ID	Time	ft ³	In. H ₂ O		°F	۴F	In. H ₂ O			۴	۴	in. Hg
17-1	951	825.3	1.2	271	\$7	\$\$	1.3	20	259	56	AA	9
1	955	838.01	1.2	271	\$7	88		260	259	16		4
1-5	858	830.72	1.1	271	87	\$7	1.3	260	258	56	<u>†</u> −− <u></u> †−−−−	4
1	1003	873 77	-+	171	88	82	1.7	260	215		┝──┢───	1 G
h					1 2 2	27				120-	┟╼──┟────	
	1007	\$36.04	- 92-	270	38		1.1	261	258	<u>57</u> _	<u> </u>	4
3	1011	\$38:70	\$9	270	द्वि	\$7	1.1	361	258	57		4
	1815	841.341						<u> </u>				{
2-1	1978	541,341	1.2	a76	28	87	1.7	261	258	57		4
1	1022	844	1.2	270	88	87	1.7	361	755	18		4
2	1024	846.87	1.2	170	88	87	1.3	261	258	1/2		d -
	1030	849.22	1.2	270	<u>r</u> e	25	1.7	261	218	35		Ý
			the second design of the secon		<u>F</u>	87						4
<u>L</u>	1034	FS1. FS	1.1	270			1.2	361	33	114		
3	1038	854.47		276	50	EF .	1.2	20	253	19		4
	i092	857. 178									((
3-1	1045	837.078	1.2	27)	22	82	1.3	361	259	59		4
1	1049	\$59.71	1.2	27)	48	88	1.7	561	371	60		4
		862.25	1.1		- 	85		260	2/F	60		d — 1
		4 90.4	$\frac{1}{1.7}$	271	-9-1	33		260	215	+		₫
	057	564.88		270	Fg	FF		260		66		4-1
	<u>'al_</u>	\$67.47	.26		₹ <u>0</u> -+				253	61		
3 1	105	870.0Y	.97	270	26	FD	1.2	210	217	61		9
. [1108	SR.611										
7-11		872-611	1.2	268	8P	87	1.7	20	258	61		4
	Name and Address of the Owner, where the Party of the Par	875,21		269	30 T	77		260	258	62		4
	120	877-77	1.3			<u>F</u> Ý		260	JE	63	-++-	ý
				369		Ê.		Ž6j	258		1-10	
	and the second s	FD. 32			<u></u>					67		······································
	the same state of the same sta	F82-92			59	FF			2 F	67		
7 11	32	FE5.45	.97	269 9	KO S	(1)	<u>I. ,</u>	26	JF	67	(
11	7(FRF. 075								1		
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Comments/notes:

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AM-EMT-15 Rev. 41.2 Revised 04/02/19

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TRC Report 437378 B

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TRC Isokinetic Test Support Data Company: Loke ENERGY Project#: Plant: ENSY CHICAGO Test Method(s): Unit ID: Test Run #: HRZS 5400 Test Date(s): Location: Unit Operating Mode: Normal Console Operator: Console ID: Duct Shape/Area: Round /_254.47 ft² Meter Y: dscf/MMBtu F_d Factor: Orifice AH_{@i}: F_a Factor: scf/MMBtu 171 Pitot Tube ID: wscf/MMBtu F_w Factor: Cal. coefficient (Cp): Fuel heat content: Btu Process/fuel flow rate: Probe Liner Material: ر ک ۸ Nozzle Material: Soot blown? N/A Fuel Type: Nozzle Diameter (D_n): N/A în Duration: min Sample collection time Tare wt. Final wt: Total # of points: lmp # Contents (grams (grams) 921 0.1N HNO3 Target Sample time/point: 161. min 40. Target run duration: min 0.1N HNO3 2 91 Empty JY. 1/ in Hg Barometric Pressure (P_{bar}): Silica 4 Stack Static Pressure (P_a): in H2O Stack Pressure (P_,): うらくつ in Hg Leak Checks 206.6 CFM @ /5 "Hg Net grams (M_{H20}): Pre-Test Train Leak Check: کەي، Pre-Test Pitot Leak Check: KAZT. (Pass or Fail) CFM @15 Gas Molecular Weight Method: Post-Test Train Leak Rate: 1004 "Ha 30 INSTRUMENTAL Post-Test Pitot Leak Check: Part % CO₂ : (Pass or Fail) %vol dry % O₂ : PRSS Pump/Orifice Leak Check: %vol dry (Pass or Fail) % Nitrogen + % CO : Filter/Thimble ID: 8 %vol dry 70 M_d - dry basis : 🎵 Tare Weight: grams ib/lb-mole **Description of Filter and Front Half Rinses:** Description of Impinger liquid:

General Comments:



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TRC Report 437378 B

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Company: Plant:	Epsil	ENERCY Chicobo		Methods:	<u></u>	318			X-Factor		21 rd	
Unit:		24		Run #:	2				Minutes/pt	: <u> </u>	······	
Location:		Track	ira	verse Sheet:		of		- <u></u>		ita not entere	all the Plane of	
Mart P	7	Meter			Day (as Meter	Orifice	Probe	Filter			
Port & Point	Clock	Volume	ΔΡ	Stack	Inlet	Outlet		Liner	Outlet	Outlet	ger Train CPM Filter	Pui Vaci
ID	Time	ft ³	In H ₂ O	°F	°F	°F	In. H ₂ O	°F	°F	°F	°F	In.
1-1	1200	858.50	1.2	269	86	85	1.3	219	162	55	NA	4
1-1-	1200	591,01	1.2	269	86	K	13	255	262	55	1	4
<u>'</u> -	1202	893,65	1.2	25	87	56	17	259	262	55		4
	1208	896.27	1.2	33	87	56	13	260	262	10	╬──╂┈───	4
<u>~</u>	1216	818.53	1.0	268	\$7	£7	15	260	262	16	┢──┟────┤	9
	1220			268		57		20	262	50		4
	1224	<u>901.48</u> 904.077	1.0	-005	88		1.1	240			┝	_7
				20	57	10-7	17-3	2/5-	777	55	┝━━-┠────┤	
	1227	904.073	- 1.1	268	27	12	1.2	260	261	2 <u></u>	┝╍┉┨───┤	7
	1231	906.63	1.1		87	\$7_		260	261	57	·	<u> 4</u>
	135	909		268	87	81	1.2	200	363	17		4-
	1239	911.65		265	57	87	1.2	Xo	262	57		7
	1243	914.15	.93	368	84	97	1.0	260	362	37		4
	247	916.69	163	562	FP	F7	1.0	259	262	58		9
	251	919,19	<u> </u>							· · ·		
3-1 11	354	919.11	1.2	269	8F	<u> </u>	1.7	253	261	55	·	<u>4</u>
i 1	255	521.81	1.2		58	8F	1.7	259	261	59		<u>4</u>
[].	393 1	524.41	1.3	261	9<)	84	13	225	262	53		4
31	7/16	27.02	1.2	265	50	FP FP	13	251	262	51		Ч
		129.62	1.6	765	90	Pi	\overline{J}	258	263	03		4
	314 5	30.22	1.6	268 1	31	57		259 1	262	125	4	Y
	318 9	34.828							₹			-
		134.520	1.2	262 5	N	PF	17 -	758	262 1	60		1
		37.49	1.2		-8-	FF		253 5		61		7
2 1			1.2	367 4	30	18		40		21	T	1
7 1		42.63			and the second	88	1.3 3	5		51 .	4	
		45.22	· ·		***	FT	1.7 12			62 -	1-14	
		47.81			0	CP /			$\sqrt{2}$	ž T	1	7
			<u> </u>	×		r 2	<u> </u>		2	s	++- ⁻	
/_	305 9	150.383			· 					<u> </u>	┟───┼──	
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Comments/notes:

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M4 MOISTURE ANALYSIS DATA SHEET

Client Name PM	MAM ENERGY		Project Number	437378
		ILITY	Sample Method	MZ
	ST CHICAGO,	IN	Recovery Location	MOBILE LAB/TZU
	TACK ZOI		Analyst Signature	
		······································		
Run Number	<u> </u>	2	3	~
Test Date	6-9-21	6-9-21	6-9-21	
Recovery Date	6-9-21	6-9-21	6-9-21	
Recovered By	B. CACAU	B. CACAD	13. CALKO	
Impinger 1 0.14 HNDz				
Final Weight, g	882.0	832.1	927.0	
Initial Weight, g	727.4	655.8	761.3	
Net weight, g	154.6	176.3	165.7	
Impinger 20. IN HNO				
Final Weight, g	685.6	767.8	663.6	
Initial Weight, g	642.5	745.4	64D.	
Net weight, g	43.1	22.4	23.5	
Impinger 3 EMPT)		······································		
Final Weight, g	649.4	564.6	594.2	
Initial Weight, g	643.8	562.4	591.9	
Net weight, g	5.6	2.2	2.3	
Impinger 4 <u>SIUCA</u>	-			
Final Weight, g	748.2	8/5.8	857.8	
Initial Weight, g	730.3	801.5	842.7	
Net weight, g	17.9	14.3	15.1	
Impinger 5				
Final Weight, g				
Initial Weight, g		·		
Net weight, g				
Impinger 6			RE FTOHT HAVE MA	<u>8</u>
Final Weight, g	= 100 M	= 100 m	= 100 m	
Initial Weight, g			St BACK HANT MA	
Net weight, g	= 220 M/	= 220 m/	= 720 m	
Impinger 7		_		
Final Weight, g	cn = 6.2	C02 = 5.8	C02 = 5.7	
Initial Weight, g	02= 12.0	02= 12.4	02=12.6	
Net weight, g				
Total Catch, g	221.2 V	215.2 🗸	206.6 🗸	

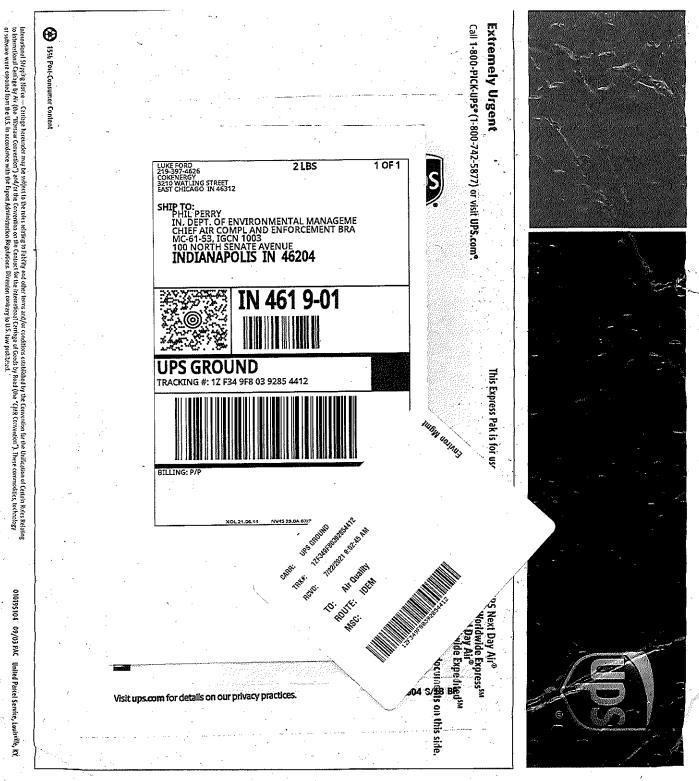
Balance ID: P821017 Weight ID: 4588 Weight (g): 500 weight reading within 0.5g? weight reading within 0.5g? weight reading within 0.5g? weight reading within 0.5g? 88 OF 88

Y or N	Date
Y	6-9-21
/	1

TRC Report 437378 B

Checked By:

Date:



From:	Ford, Luke
То:	IDEM Test Protocol
Subject:	RE: Cokenergy T089-41033-00383 RATA/Lead Test Notification
Date:	Monday, May 24, 2021 9:36:06 AM
Attachments:	image002.png
	image001.png
	CE 2021 14day Test Notification 052421.pdf

**** This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. ****

Attached please find the 14 day test notification for planned relative accuracy tests audit (RATA) and lead stack test scheduled to be completed at Cokenergy on June 8, 2021.

If there are any questions, please do not hesitate to contact me.

Luke E. Ford Director EH&S **Primary Energy** 3210 Watling St. MC 2-991 East Chicago, IN 46312

Email <u>lford@primaryenergy.com</u> Office (219) 397-4626 Mobile (773) 447-8257



Efficiency is the Best Alternative Energy

From: Ford, Luke
Sent: Tuesday, April 27, 2021 7:32 AM
To: IDEM Test Protocol <Test_Protocol@idem.IN.gov>
Subject: Cokenergy T089-41033-00383 RATA/Lead Test Notifications

Attached please find the test notifications for planned relative accuracy tests audit (RATA) and lead stack test scheduled to be completed at Cokenergy the week of June 7, 2021.

If there are any questions, please do not hesitate to contact me.

Regards,

Luke E. Ford

Director EH&S

Primary Energy 3210 Watling St. MC 2-991 East Chicago, IN 46312

Email <u>lford@primaryenergy.com</u> Office (219) 397-4626 Mobile (773) 447-8257



Efficiency is the Best Alternative Energy



May 24, 2021

Via Electronic Mail

Indiana Department of Environmental Management Compliance and Enforcement Branch Office of Air Quality 100 N. Senate Avenue Mail Code 61-53, IGCN 1003 Indianapolis, IN 46204 - 2251

Subject: Cokenergy, LLC 14-Day Test Notification Part 70 Permit T089-41033-00383

To Whom It May Concern:

In accordance with 326 IAC 3-6-2 (h), Cokenergy, LLC hereby notifies you of an upcoming relative accuracy test audit (RATA) and stack test for lead. The testing is currently scheduled for the week of June 7, 2021 with a planned test date of June 8, 2021. The Test Protocol for RATA and lead testing was submitted on April 27, 2021.

If you have any questions, please contact me at (219) 397-4626.

Sincerely,

John S. Fil

Luke E. Ford Director EH&S Primary Energy

File: X:\\ 613.2 and 674.4

From:	Cline, Dave
То:	FISHER, JARROD; Haun, Vivian
Subject:	FW: Cokenergy T089-41033-00383 RATA/Lead Test Notifications - Compliance Protocol
Date:	Tuesday, April 27, 2021 10:35:32 PM
Attachments:	Cokenergy LLC Pb testing protocol.pdf
	<u>089-41033-00383.pdf</u>
	image002.png

JCF For review

From: IDEM Test Protocol <Test_Protocol@idem.IN.gov>
Sent: Tuesday, April 27, 2021 10:47 AM
To: Cline, Dave <DCLINE@idem.IN.gov>
Subject: Cokenergy T089-41033-00383 RATA/Lead Test Notifications - Compliance Protocol

Protocol to be assigned for review.

From: Ford, Luke <lford@primaryenergy.com>
Sent: Tuesday, April 27, 2021 8:32 AM
To: IDEM Test Protocol <Test_Protocol@idem.IN.gov>
Subject: Cokenergy T089-41033-00383 RATA/Lead Test Notifications

**** This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. ****

Attached please find the test notifications for planned relative accuracy tests audit (RATA) and lead stack test scheduled to be completed at Cokenergy the week of June 7, 2021.

If there are any questions, please do not hesitate to contact me.

Regards,

Luke E. Ford Director EH&S

Primary Energy

3210 Watling St. MC 2-991 East Chicago, IN 46312

Email <u>lford@primaryenergy.com</u> Office (219) 397-4626 Mobile (773) 447-8257



Efficiency is the Best Alternative Energy



April 27, 2021

Electronic Submittal – Test_Potocol@idem.IN.gov

Indiana Department of Environmental Management Compliance and Enforcement Branch Office of Air Quality 100 North Senate Avenue MC 61-53 IGCN 1003 Indianapolis, IN 46204-2251

Subject: Cokenergy, LLC Test Notifications Part 70 Permit T089-41033-00383

To Whom It May Concern:

Please find enclosed the test notifications and sampling protocol for the upcoming relative accuracy test audit (RATA) and lead testing to be conducted at Cokenergy. We propose to complete the testing the week of June 7, 2021.

If you have any questions, please contact me at (219) 397-4626.

Sincerely,

Tuke J. For

Luke E. Ford Director EH&S Primary Energy

cc: N. Estrada, IHCC

File: X:\\ 613.2, 674.4



VOC AND TOXICS COMPLIANCE TEST PROTOCOL

State Form 55058 (7-12)

Indiana Department of Environmental Management

256968

Office of Air Quality, Compliance Data Section

INSTRUCTIONS: Please complete this form and mail it back to: 100 N Senate Avenue, Mail Code 61-53, IGCN 1003, Indianapolis, IN 46204-2251; or fax it to: (317) 233-6865; or e-mail it to: Test_Protocol@idem.IN.gov.

Date Prepared:			/08/2021	Plant Addr	ess: 3210 Watling Str	eet, MC 2-991	Plant Location: East	Chicago
1. SOURCE INFO	O: ID/Permit No.: T089-41033-0	0383		5. Check	Applicable Program:	AGENCY USE	DNLY: Date Received: 4-	27-2021
	okenergy, LLC			Title V:	FESOP:	Inspector:	CYU Approval date:	
Mail Address: 32	10 Watling Street, MC 2-9	91	50 C	SSOA:	MSOP:	Reviewer:	JCF Comments:	
City, State, ZIP:	East Chicago	IN 46	312	Other: 🗸	Specify: Consent decr	ee		
Company Contac	t: Luke Ford	Telephone: (2	19) 397-4626		-			
	NY INFORMATION							
	RC Environmental							
Address: 7	521 Brush Hill Road			6				
City, State, ZIP:	Burr Ridge, IL	A 60	527	0.		SAMPLE SI	TE LOCATION	
Contact:	Gavin Lewis	Telephone: (3	12) 533-2025	_		Disturbance	Does sample port location meet 40 CFF	8 60, Appx. A,
3. PROCESS INF	ORMATION (Submit a separa	te form for each unit to	o test.)	1 \			Method 1, Sec. 1.2 Requirements:	●Yes / No〇
Unit to Test:	S	stack 201		י גן			If No, explain:	
Maximum Rated	Capacity:	960 kpph		11	<u>}</u> ∧ [
	ing Speed: Normal load of c			A				
Describe method	used to determine operating	evel:		\downarrow				12000
Steam Produc	tion Rate					o " ov	Approximate Stack gas flow (ACFM):	1,275,000.0
						Sampling Site	Approximate Stack gas temp (deg. F):	290.0
							Approximate Stack gas moisture (%):	12.0
-	Equipment: FGD and Baghous	e					7. REASON FOR TE	
Pollution Control Process Descript		e		⊸В			Operating Permit:	OYes / NoO
-	ion:	e		↑ ^B		Disturbance	Operating Permit: Construction Permit:	
Process Descript	ion:	e		A A B		Disturbance —	Operating Permit: Construction Permit: If yes, Unit Start Up Date:	OYes / NoO
Process Descript Electrical gene	ion: erator			B		Disturbance —	Operating Permit: Construction Permit: If yes, Unit Start Up Date: State Agreed Order: Please include No.	OYes / NoO OYes / NoO
Process Descript Electrical gene List and describe	ion: erator organic raw materials used ir			A B A B A B A B A B A B A B A B A B A B		Disturbance 	Operating Permit: Construction Permit: If yes, Unit Start Up Date: State Agreed Order: Please include No. Title V:	OYes / NoO
Process Descript Electrical gene List and describe	ion: erator		· · · · · · · · · · · · · · · · · · ·	↓ B ↓ B		Disturbance -	Operating Permit: Construction Permit: If yes, Unit Start Up Date: State Agreed Order: Please include No.	OYes / NoO OYes / NoO
Process Descript Electrical gene List and describe Waste heat fro	ion: erator organic raw materials used ir om IHCC Coke Ovens	process:			Distance A 73.8	Disturbance 	Operating Permit: Construction Permit: If yes, Unit Start Up Date: State Agreed Order: Please include No. Title V: Compliance with 326 IAC NSPS 40	OYes / NoO OYes / NoO OYes / NoO
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Process Descript Electrical genu List and describe Waste heat fro Person responsit Luke Ford Fuel Type: Wast 4a. Method 1-4	ion: erator organic raw materials used in om IHCC Coke Ovens ole for recording Process and 0 e Heat	process:			Distance B 201.6		Operating Permit: Construction Permit: If yes, Unit Start Up Date: State Agreed Order: Please include No. Title V: Compliance with 326 IAC NSPS 40 CFR 60 Subpart: Other (EPA, CD, State, 114): Consent decree 18-cv-35, 326 IAC 3-6-2(a) requires this comp	OYes / NoO OYes / NoO OYes / NoO OYes / NoO paragraph 22
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